

The effectiveness of a training program based on the constructivist theory in developing skill performance and aesthetic perception in forming with materials for students of the College of Education at King Faisal University

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Abstract

The research aims to address the artistic deficiencies of students in employing their skills and previous experiences in designing and implementing a tight structure for artistic work based on the synthesis of materials and the development of aesthetic perception. Previous cognitive structures to reach new experiences and knowledge structures, and the research sample consisted of (15) student of the College of Education at King Faisal University, A pre and post test were applied to them in the test of skill performance - and a test of concepts of aesthetic perception of artistic work based on the synthesis of materials, and the results concluded that there are significant differences at the level of (0.01) between the average scores of the performance skills scale and aesthetic perception in the test (pre - post) in favor of the post-test, which indicates the effectiveness of teaching with constructivist theory for developing skill performance and concepts of aesthetic perception among the experimental research sample.

Keywords: constructivist theory, forming with materials, performance skills, aesthetic perception.

INTRODUCTION

Art education acquires its importance to achieve its goals through a teacher aware of the possibilities of the subject to be able to modify the behaviors and develop the skills and abilities of the students. This requires the teacher to use many modern learning strategies and theories to reach the best teaching results. Skilled performance is a complex behavior in which all sensory components are interlinked. Physical, mental, cognitive, emotional, dynamic, and social, and it is also linked to multiple forms of thinking, the most important of which is innovative thinking, all of which combine in the structure of the artwork. (Shaltout & El-

Shennawy, 2014). And the field of forming with materials is an area that makes the student active, building his knowledge and experiences by interacting and facing real problems with the material, by researching, experimenting, and acquiring the experiences of others, and not creating an image or copies of reality as we find in many of the students' work, and this is what the constructivist theory emphasized. "each individual builds knowledge by himself in which means that knowledge is nothing but a personal construction and a mental scheme through cognitive processes, just as the constructivist theory has now become one of the most important modern educational trends in the

process of teaching and learning". (Al-Tamimi & Abbas, 2016).

In addition, the artistic work based on the synthesis of materials has many structural aspects in its various forms and functions and methods of plastic treatments aesthetically and technically. It is also based on many experimental entrances that promote aesthetic perception, the building system of the artwork is linked to the methods of operation of the ore and adapted to integrate them and create a kind of harmony between them to show aesthetic values

This requires successful building processes that depend on the student's imagination, technical backgrounds, and subjective experiences that are built through maturity, awareness, and experience, and accordingly, synthesis necessarily requires a comprehensive understanding of the foundations of building artistic work and possessing the skill of technical performance and the ability to control and control the multiple variables of the material in terms of its ability to form. Thus, he reformulates these technical and artistic experiences through new experimental practices during which he acquires performance skills and new methods, methods, and formulations according to the experimental situation he is going through, emphasizing the plastic values and the aesthetic aspect of the artistic work.

Research problem:-

There are many experimental practices that the student has undergone in many of the art fields that he studied, including metalworking, wood, the basics of design, weaving, and the course of stereoscopic formation through which he acquired many skills and techniques that he can apply in new creative situations, despite that However, it lacks the design of a tight structure for artwork based on the synthesis of raw materials, as well as skill performance, aesthetic awareness, and lack of awareness of its ability to employ those overall skills in the structure of artwork.

The problem of current research is determined in the next questions:

1. What is the effectiveness of a training program based on constructivist learning in developing skill performance in the field of forming with materials?

2. What is the effectiveness of a training program based on constructivist learning in developing the concepts of aesthetic perception in the field of forming with materials?

Research hypotheses:

1. There are statistically significant differences between the average grades of the students of the research group in the two applications (pre and post) in the test of concepts of aesthetic perception of composition with materials in favor of the post application.

2. There are statistically significant differences between the mean scores of the students of the research group in the two applications (pre and post) in the assessment card for the performance skills of forming with materials in favor of the post application.

Research aims:

1. Exploring the effectiveness of a training program based on the constructivist theory in developing skill performance and aesthetic perception in the field of forming with materials.

2. Developing the students' fine performance skills in the field of forming with raw materials.

3. Building students' aesthetic knowledge positively.

Research significance:

1. The current research is an actual application of using modern strategies in teaching and learning.

2. Directing the researchers' attention to the importance of constructivist theory and how to apply it in teaching art education in general and the field of composition with materials in particular.

3. The current research can contribute to the development of skill performance and concepts of aesthetic perception among students, as the development of skills is a primary goal that the field of materials formation seeks to achieve and develop.

Research limitations:

1. Human limitations: an intentional sample consisting of (15) students in the course

of forming with environmental and raw materials CRN: 51889.

2. Objective limitations: production of a hanging artwork using: wood, natural leather, copper- wires, beads and threads. Material forming skills such as (design-forming-technique-finishing).

3. Time Limits: The research experiment was applied in the first semester of the year 2019:2010.

4. Spatial limitations: Art Education Department, College of Education, King Faisal University.

Research Methodology:

The current search follows the next approaches:

- The analytical descriptive approach: It was used in the theoretical framework and the preparation of tools, as it is based on collecting, classifying and analyzing information and data through previous literature, studies and research related to the subject of constructivist theory.
- The quasi-experimental approach: It is represented in the selection of the research group and the application of its tools, where the research group was selected and according to this the experiment was applied with a pre-test using the used (traditional) teaching method and a post-test for the group after using the teaching method of the program based on the constructivist learning theory, and by comparing the results of the statistical analysis of the scores The pre and posttest in the skill performance test - achievement test. It was possible to measure the effectiveness of the training program based on the constructivist theory as an independent variable on the dependent variable: skill performance and aesthetic perception among students.

Theoretical framework:

The constructivist theory studies the construction of the learner's mental knowledge, in light of their previous experiences, and constructivism is divided into two curves, one of which is cognitive which goes back to -Jean Piaget- where he sees that learning comes through contemplation. The reinforcement of learning does not come from the environment

but from the ideas of the learner himself. So there is a relationship between constructivism and learning theory, about cognitive growth, which assumes that learning is an internal mental process that includes cognitive structures, and re-formed as a result of the interaction between the student, teacher, and the environment, which helps the learning to occur and appear in the form of mental activities, perceptions, and concepts, while the second curve focuses on interaction with The teacher and peers as effective procedures for the occurrence of learning. (Jadallah, 2000) and these cognitive structures are organized in the brain, which Piaget called intellectual schemes or self-organization, and they take place in interrelated cognitive processes represented in the following: -

1. Representation: a process by the mind to absorb new experiences according to the cognitive structure and put them in an already existing scheme.
2. Alignment: the process of modifying the structure of the mind when it passes through experiences that were not represented before to fit with the new influences.
3. Organizing: It harmonizes new and previous experiences to produce knowledge structures of a more complex level.

Foundations and principles of learning in the constructivist theory in the learning and teaching process:

- Organizing learning and teaching around important big ideas or themes.
- The importance of prior knowledge and its connection to new knowledge is a prerequisite for building learning.
- Creates a field of doubt and uncertainty.
- Learning is a collaborative cognitive adventure (Awkar, 2013).
- Learning is an active and continuous constructive process that achieves a successful interaction with environmental stimuli.
- Constructivist theory emphasizes the use of new knowledge in rebuilding old systems.
- Constructivism emphasizes individual differences among learners.

- The learner makes a mental effort to discover knowledge on his own. (Sheriff, 2002).

Educational practices of constructivist theory in teaching the field of formation with materials:

Teaching from a constructivist perspective: the process of organizing the educational situation in a way that enables the learner to acquire techniques, synthesis skills, and structural systems curriculum appropriate to the artwork and various experimental approaches, thus, he builds his own knowledge with a little guidance, the more experiments the student has, the greater his experience. To consolidate the understanding, the theory is based on two basic logical premises, firstly: that learning proceeds from a starting point and is represented in the knowledge, attitudes and tendencies that students bring to the educational situation, secondly: learning results from the interaction between these characteristics and experience, which is consistent with constructivist pedagogy. Providing interactive experiences with students' characteristics so that students build their understanding" (Al-Assaf, 2017).

The constructivist theory aims to improve the quality of education and prepare learners with a degree of competence and ability to adapt to a more changing world in light of the Continuous updates.

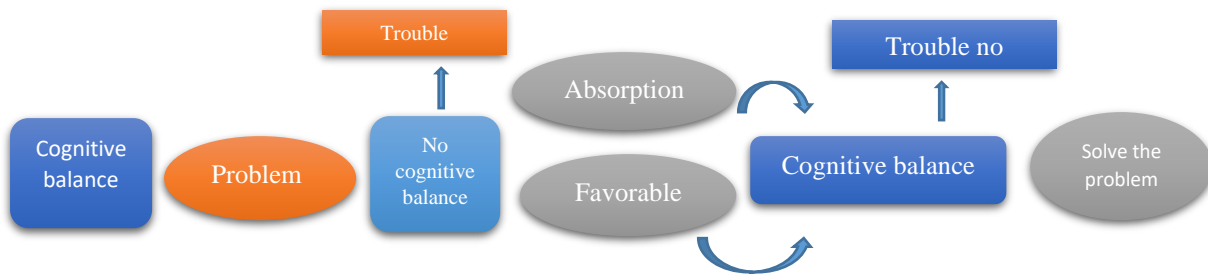
The teacher's role in constructivist learning:

1. Organizer of The learning environment in such a way that it spreads an atmosphere of open-mindedness and democracy in expressing opinions and making decisions.
2. Back-up source of information if needed.
3. A model from which students gain experience when they are assigned to do some tasks in front of him and under close observation, and then each of them goes to work alone most of the time.
4. A participant in the learning management and evaluation process.
5. Provider of learning tools to accomplish collaborative learning tasks with students. (Zaytoun, 2003).

The field of forming with materials depends on understanding the plastic capabilities of materials to achieve non-typical experiences based on analysis, installation and organization called subjective experience, This Experience, as constructivists believe, is a necessity of action and an imperative to learn. It is an intentional, continual activity; conscious will, vision, and thought that reveals transformation systems to achieve new aesthetic values every time, from this, we can set rules for the application of constructivism in the field of forming with raw materials, and put some questions for students to make mental activation with their technical skills in many areas that can serve the construction of the artistic work, the questions as following:

- What are the technical experiences that you have gained in the field of metalworking?
- How can the structural design rules be applied in the artwork?
- What are the acquired skills to operate leather?
- What are the techniques for treating wood surfaces?
- How can synthesis and experimentation in raw materials?
- What are the structural foundations of stereoscopic formation?.

In light of the previous questions, we extract how to obtain the skills and experience that the students 'gained in fields of study, to produce artwork that depend on synthesis and experimentation approaches in different materials through the processes of (absorption and embedding). Figure (1) Here we mean linking the new information with the information and ideas that the students have in their knowledge structure and merging them together, which leads to the emergence of new information and ideas that develop the knowledge structure, and lead to its modification after the new information becomes a part of the new knowledge structure. (Zaytoun & Zaytoun, 2003).

Figure (1) *Structural model*

Constructivist theory and technical performance skills in the field of forming with materials:

The theorists of this thought believe that learning occurs because of modifying the ideas possessed by the learner, or adding new information, or reorganizing his existing ideas, meaning that the focus in constructivist thinking includes both The cognitive structure and processes that take place within the learner within the framework of the organizational and structural context of the artistic work, and that the pedagogical knowledge building of the work of students depends on three main aspects: maturity, awareness and experience. These aspects lead to a kind of balance in cognitive development, as they focus on mental processes and what happens inside the mind of the learner to acquire knowledge. (Dakhil Allah, 2014). Dakhil Allah also adds that these processes help organize information and integrate it into his knowledge structure.

Any general constructivist pedagogy that requires cognitive skills that enhances the intellectual disputes required by the creative situation, from which the student can control the design formulations and experimental entrances to operate the materials according to their characteristics and plastic capabilities Artistic.

The materials are multiple and intertwined, and the performing methods differ in the field of forming with materials, which makes the student face many variables during experimental practices and the creative attitude, and he has to determine the roles of the materials, which works to formulate and form the elements and motif of the Artistic work to integrate his mental image that combines function and beauty (surfaces, colors, space, and shadows). Hence, the student must be familiar with the total performance skills related to the cognitive, mental and dynamic aspects, to make the plastic construction of this artistic work successful on the one hand, and on the other hand, which is

related to the use of tools and the diversity of materials Performing skill is a combination of all kinds of skills, and it is a complex technique that requires muscular and mental skills, and is graded from simple to complex., the student must use what he has of ideas and learn how to manage new experiences, and choose the optimal ones and collect them in an arrangement to compose a system that gives the whole structure its form, value and function, so that all of them combine to produce the artistic work, so learning occurs Figure (2) when reforming and organizing cognitive structures previous or adding new information during the experimental practices that he went through.

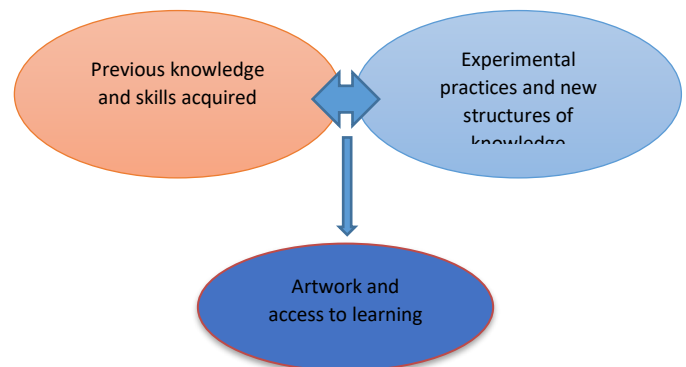


Figure (2)

Aesthetic perception in artwork based on the formation of materials.

Perception is from the standpoint of the aesthetic dimension and is one of the main pillars of artistic work; its value depends on the method of operation and technical treatments of the material and the design and plastic formulations in line with the capabilities of the plastic material. In it, all the material tools are fused as a sensory medium according to the student's perception to get the work to the final stage that carries plastic values and aesthetic dimensions.

The aesthetic perception of the artistic work connects us to the constructivist theory, Gestalt

and cognitive theory, and this is according to their theoretical foundations and their educational purpose, where constructivism considers that the learner is the one who builds his knowledge on his own through what he has of mental, cognitive and affective capabilities, while Gestalt is concerned with the processes of perception and that the mind is coherently aware of the constituent parts of the whole Regularity, complementary relationships and dynamic interdependence. Perception, reorganization, and insight are a prerequisite for the learning process, and the external environment is devoid of meaning and acquires its meanings from how the individual perceives its elements. (Zain El-Din, 2007) and understanding its dimensions, reading the plastic relations between the parts and controlling them, the cognitive theory focused on the mind in the learning process, which processes the physical information related to the formal bodies of the materials, which takes a set of appropriate methodological and cognitive strategies that make it use the information acquired in a imaging system to access to new data.

Conditions for the occurrence of aesthetic perception among students:

1. Stimulating presence. (Material).
2. Sensation of stimulus.
3. Recognize the stimulus: insight and understanding it.
4. Response: Through previous cognitive experiences and the experiments, he went through.

Before starting the processes of structural composition of the artwork based on materials, the student's mind performs organizational cognitive processes for what he perceives of materials and the subsequent plastic treatments and design formulations, by referring to cumulative experiences and self-experiences with some educational consultations, trying to make a structural composition through which he realizes aesthetic values. It reflects a kind of harmony and satisfaction, or vice versa, of the elements, relationships and proportions, and here the importance of the role of the accumulated experiences is revealed. (Shaker, 2013) Aesthetic perception is linked to the creative ability within the student's subconscious mind, as it is a cognitive mental

process and a stage of maturity and awareness of aesthetic values, the foundations of construction, and the formative and technical dimensions of the artistic work.

We can summarize some of the supporting point to the process of aesthetic perception as follows: -

- The student's awareness of the aesthetics of the material in terms of the formal characteristics "texture, color" and the utilization of its potential energy.
- The student can reach the structure of the artistic work through the processes of analysis and technical installation.
- Possessing an inductive ability to reveal the relationships of internal structures in the artistic work and construction processes, including "differentiation, dismantling and fragmentation."
- Awareness of synthesis processes according to different experimental methods.

The artistic work is the sensory aspect that is achieved in the aesthetic subject, and this structure expresses an internal movement and is an aspect of guidance to understand the relationships that exist between the components of the work structure The student's awareness of the value of the material, its visual properties, and its plastic capabilities, helps him to invest it in design without limiting it to performing functions that exceed its capabilities, the design of the artwork goes through the processes of analysis and composition, then analysis again to generate solutions to meet aesthetic and plastic requirements. (Ali & Ali, 2017).

Structural composition and technical practices to achieve aesthetic values:

The artist took the material as a mediator to create through its data and form values as a sensory mediator material through which he perceives work as a form, and exploits its various plastic and technical capabilities information to reach a distinctive proposition with broad, inclusive and contemplative expressive formulas that focus on expressive and implicit forms that focus on the expression. (Samir, 2015). This makes us address the role of technology in realizing the aesthetic value and expressive contents of the artistic work.

The material has sensory qualities, data, and natural properties that help the student to realize his idea, so the mastery of choosing it is a means in itself. Building artistic work includes many processes such as formation rules and foundations of composition in addition to the foundations of design, to achieve artistic values. The student's possession of methods and technical skills makes him have the ability to control the material conservatively on its value and characteristics. (Ali, & Ali, 2017). Material has an important role in embodying and sensing the aesthetic values, which are achieved by the plastic elements and motif that contribute to the plastic construction, achieve an aesthetic, functional, and intellectual role in artistic work, and are linked to mutual relations with the neighboring elements, taking into account the values (balance, unity, rhythm, dominance, and proportion). (Ali & Hussein, 2017). We conclude from the foregoing that the structural composition of the work is not just a study of how to build, but it also has to frame static relationships and create dynamic relationships to achieve balance in the artistic work.

The experimental framework:

This aspect includes the following:

1. Preparing a list of forming skills with materials (prepared by researchers).
2. Preparing a list of the concepts of aesthetic perception of composition with materials (prepared by researchers).
3. preparing a training program based on the constructivist theory, according to the following steps:
 - A. Determine the general and behavioral objectives of the training program.
 - B. Preparing the program's content of topics.
 - C. Designing tasks, situations, and educational activities for learning in the light of the constructivist theory.
 - D. Determining the teaching aids and tools necessary for the proposed training program.
 - E. Determine the evaluation methods that will be followed.

F. Presenting the training program in its initial form to a group of arbitrators to control it objectively in light of the following:

- Adaptation of the content to the objectives of the training program and the level of students.
- Diversity of experiences and activities included in the content.
- The compatibility of the evaluation methods with the content and objectives of the training program.
- Building the training program in its final form in light of the opinions and suggestions of the arbitrators.

Research tools:

A) Preparing a test to measure students' skill performance in forming with materials (prepared by researchers):

The construction of the skill performance test went through the following steps:

- The objective of the test.
- Determine the creation sources of the test.
- Determine the type of test vocabulary.
- Formulate and build test vocabulary.
- Test arbitration.
- The exploratory experiment and the calculation of the validity and reliability of the test.
- Test stability.

B) Preparing a test of the concepts of aesthetic perception of forming with materials (prepared by researchers):

The construction of the concept test went through the following steps:

- The objective of the test.
- Determine the creation sources of the test.
- Determine the type of test vocabulary.
- Formulate and build test vocabulary.
- Correction of the test.

- Test arbitration.

C) Skill performance evaluation card for forming with materials (prepared by researchers):

- The objective of the performance evaluation card.
- Determining the sources of building the performance evaluation card.
- Determine the type of performance evaluation card skills.
- Drafting and building the performance evaluation card vocabulary.
- Correcting the evaluation card.
- Arbitration of the performance evaluation card and conducting the exploratory experiment to control the procedural treatment materials and research tools.
- Teaching the proposed training program for the research group.
- Applying the measurement tools (skill performance test - testing concepts of aesthetic perception - skill performance evaluation card) afterward on the current research group.
- Discussing and interpreting the results.
- Presenting proposals for the current research in light of the application of research tools, procedures, and results.

Search terms:

The training program: "a set of organized procedures, various tests and questionnaires, and practical practices carried out and apply by art education teachers and their application to students" (Al-Saeed & Al-Husseini, 2007).

Constructivist theory: a philosophical view concerned with the mental structure of the learner, and how to construct the meaning of knowledge in the mental structure, in the light of their previous experiences. (Prawat & Folden, 1994).

Procedural definition: a continuous creative constructive mental process responsible for re-formulating and operating materials and techniques according to the immediate experimental situation and what the structural construction of the artistic work requires of

organization and a broader aesthetic enrichment than what their previous experiences suggest

Perception:

It is "the psychological process that contributes to reaching the meanings and connotations of things, people, and situations that the individual deals with by organizing, interpreting, and formulating sensory stimuli related to them in meaningful wholes (concepts)" (Abdul-Azim, 2016).

Aesthetic perception:

"It is one of the most important stages of awareness of aesthetic values, just like the stages of feeling, experience, standard and aesthetic educational behavior that leads to the most important stages after that, which is the stage of aesthetic taste." (Shaker, 2013).

Skill:

"The use of information effectively and with high technology to accomplish a specific work, and it includes speed, flexibility, and ease" (Musa, 1982).

Al-Laqrani & Al-Jamal (2003) define it, as "it is the easiest and accurate performance to understand what a person learns, kinesthetically and mentally, while saving time and costs."

Review of the related

Jawad K, Al-Najjar. (2015)

This study addresses the problem of learners' weakness in reconstructing cognitive concepts in the pictorial construction material in the form of a picture of conceptual systems and formats, and the learners' inability to employ knowledge in developing their synthetic analytical skills. So: Building educational units to develop analysis and composition skills in the pictorial construction material for the fourth stage, Drawing Branch - Plastic Arts Department. In addition, measuring the effectiveness of the educational units whose construction was based on the foundations and principles of the constructivist theory. It became clear after applying the educational units and comparing the results of the pre and post-tests for the two experimental and control groups. The students of the experimental group who studied the educational units according to the

constructivist theory outperformed, which showed that the students reached the skills of analysis and composition in the subject of pictorial construction.

Training program:

Program title: A proposed training program based on the constructivist theory in developing skill performance and aesthetic perception in the field of forming with materials.

First: The General Objectives of the Program: The goal of the program is to develop skill performance and aesthetic perception among students of the College of Art Education, King Faisal University, Department of Art Education (research group). These skills were as follows: -

- The skill of schematic design of the artistic work.
- The skill of synthesis and forming with materials.
- The skill of finishing the artistic work.

Second: The procedural objectives of the program: After the student has gone through the experience of the program, the student have to be able to:

1: Cognitive aims:

- Explain the concept of design and its elements.
- Arranges his previous ideas and experiences and the formation of new ideas.
- Exchanges ideas with his peers to arrive at an innovative form of artwork.
- Learn about constructivist theory and its steps.
- Understands some aesthetic values (equilibrium - unity - rhythm ...).
- Explains the concept of constructivist theory and its principles.
- Discovers what he learns through his scientific thinking practices.
- He acquires knowledge from his colleagues who possess the knowledge and imitate them.
- Explains the concepts of aesthetic perception included in the academic content

(closeness -similarity - closure - continuity - materials - synthesis - function).

- Displays the scientific content of the material in different ways verbally.
- Determines and arranges educational tasks (design - implementation - output).
- Absorbs information related to aesthetic perception to build knowledge.

2: Skill aims:

- Applying the findings of the information to create an artistic work.
- Experiments with the structural foundations (overlap - delete - add).
- It achieves the aesthetic values of (balance - rhythm - unity - texture - color).
- Employs design elements (line - space – color...etc.).
- Training on construction processes (differentiation - disassembly - fragmentation).
- Acquire the skills of synthesis between materials.
- Mastered wood carving skills.
- Uses other materials as plastic media such as (beads - threads - wires).
- Diversity in plastic treatments and synthesis methods that fit the structure of the artistic work.
- Employs the techniques and methods of formative formation of the artistic work.
- The connecting subject matter, material, and technique.
- Produces an artistic work that combines the aesthetic and functional aspects.
- Master the finishing skills of the artistic work.

3: Emotional aims:

- Appreciate the value of Design as the basis for every artistic work.
- Shows a positive trend towards the constructivist theory.

- Awareness of the aesthetics of the material in terms of texture – color...etc.).
- Cooperates with his colleagues in accomplishing teaching tasks (design - implementation - finishing).
- Accepts discussion, dialogue, and teamwork.
- Participate in the administration and evaluation of education.
- Encourages constructive discussion with colleagues.
- Accommodates the teacher's instructions when evaluating his artwork.
- The duration of the program: the first semester of 2020:2019, 40 hours over 10 meetings at a weekly meeting, and the duration of each meeting four hours.
- The validity of the guide to using the educational program based on the constructivist theory: it was presented to a group of arbitrators specialized in the field of art education, and some modifications were made in light of the arbitrators' opinions

Experiment evaluation card: attaché (1) A card was designed that includes a set of axes to assess the performance skills of the students in the experiment (pre - post).

Steps to prepare the card:

Determine the purpose of the card, which is to evaluate the work of the research sample in performance skills and synthesis with materials to judge the level of skillful performance of students in the field of forming with materials

The method of correcting the card: The card included the performance skills of the artistic work and the number of its main axes (3) skills, which included design skills (3 items), formation and synthesis skills between materials (4 items) and finishing skills (3 items), The number of card items became 10, and was corrected by three residents, by placing the right score for each card skill for each skill (3 degrees), to become the card score (30) degrees..

Validity of the card: The Validity was calculated by presenting the card to the specialized arbitrators, and in light of the arbitrators' opinions, some items were modified and some inappropriate items were deleted, and the card was approved in its final form of the arbitrators.

The stability of the card: The researchers used the re-correction ($n = 10$) after (15) days after the first correction, then the correlation coefficient between the scores was calculated in both times, which amounted to 0.89, which is a statistically significant coefficient at the level of 0.01 which confirms the stability of the card.

Testing the concepts of aesthetic perception: attaché (2) designing a test to measure the concepts of aesthetic perception among students in the (pre and post) experiment

Test validity: The validity was calculated by presenting the card to the specialized arbitrators. In light of the arbitrators' opinions, some test questions were modified and some inappropriate questions were deleted, and the test was approved in its final form, attaché (3) of the arbitrators.

Test stability: ($n = 10$) was re-corrected after (15) days after the first correction, then the correlation coefficient between the scores was calculated in both times, which amounted to 0.85, which is a statistically significant coefficient at the level of 0.01 which confirms the stability of the test.

Research Result:

To verify the validity of the research hypotheses and conclude results, some necessary statistical treatments for the data were carried out as follows:

First: To verify the first hypothesis of the research, the arithmetic averages and standard deviations of the pre and post-test scores were calculated in the skill performance assessment card for students in the production of artworks based on forming with raw materials, Table (1), where the Wilcoxon test was used for nonparametric tests to calculate the difference between two related samples (pre - post), and the results were as follows:

Table (1) *the results of the Wilcoxon test for the significance of the difference between the ranks of the averages of the study sample before and after on the skill performance scale*

Axes	samples	N	Mean	Std. Deviation	Ranks			z - value
					N	Mean Rank	Sum of Ranks	
design	Pre-test	5	95.8000	7.25948	0 ^a	0.00	0.00	-2.032- _b
	Post-test	5	186.6000	3.20936	5 ^b	3.00	15.00	.042
Skill synthesis and shaping with raw materials	Pre-test	5	133.6000	5.12835	0 ^a	0.00	0.00	-2.032- _b
	Post-test	5	242.0000	8.60233	5 ^b	3.00	15.00	.042
Finishing and production	Pre-test	5	103.2000	14.09610	0 ^a	0.00	0.00	-2.023- _b
	Post-test	5	181.4000	8.87694	5 ^b	3.00	15.00	.043

the previous table indicates that the mean scores of the post-test are higher than the average scores of the pre-test in the skill performance assessment card for students in the production of artworks based on the synthesis of materials. The post-test in the design axis got an average of (186.6000) with a standard deviation of (3.20936), while the pre-test got an average of (95.8000) with a standard deviation of (7.25948), and the (z) value was (-2.032-b) and the significance value. 042, a value less than 0.05, while the students in the axis of synthesis and forming skills with materials in the post-test got a mean (242.0000) with a standard deviation (8.60233), while the pre-test got an average (133.6000) with a standard deviation (5.12835) and the value (z) amounted to (- 2.032-b) and the significance value was .042, which is a value

less than 0.05. The students in the axis of finishing and output in the post-test got an average (181.4000) with a standard deviation (8.87694), and in the pre-test, the mean came (103.2000) with a standard deviation (14.09610), and The value of (z) was (-2.032-b) and the significance value was .042, which is a value less than 0.05, This confirms the high effect of the independent variable on the dependent variable.

Second: Presentation of the results related to the second hypothesis: the Wilcoxon test was also used for non-parametric tests to calculate the difference between two related samples (before and after), and the effect was calculated using the Eta square, and the results were as follows:

Table (2) *the results of the Wilcoxon test for the significance of the difference between the ranks of the study sample mean before and after testing the concepts of tribal aesthetic perception*

samples	N	Mean	Std. Deviation	Skewness	Ranks			z - value	sig	η ² .
					N	Mean Rank	Sum of Ranks			
Pre-test	15	7.7333	1,387	0.376	0 ^a	.00	.00		.0,001	0.809

Post-test	15	12.9333	1,223	0.127	15 ^b	120.00	8.00	- 3.432
Ties					0 ^c			

The previous table indicates that the means of the post-test scores are higher than the average scores of the pre-test in the concepts of aesthetic perception. The post-test got an average of (12.93) with a standard deviation of 1,223, while the pre-test got an average of (7.73) with a standard deviation of (1.387). And the value of (z) was calculated to signify the difference between the mean scores of the pre and post-test of the concepts of aesthetic perception, which amounted to (-3.432) at the level of significance (0,001), as it is clear that the size of the influence of the independent variable on the dependent variable increased; Because the value of the effect size (eta square η^2) is: (0.809) which is greater than (0.15), which means that the effect size is high, according to the classification suggested by Cohen 1977.

From the above, the results of the research summarized in the following points:

1. There are statistically significant differences between the mean scores of the students of the research group in the two applications (pre and post) in the performance skills assessment card for shaping with raw materials in favor of the post-application.
2. There are statistically significant differences between the mean scores of the students of the research group in the two applications (pre and post) in testing the concepts of aesthetic perception of shaping with raw materials in favor of the post-application.

Recommendations:

- Interest in conducting more scientific research in the field of art education based on the principles of constructivist theory in the different fields of education.
- The necessity of applying educational strategies that are consistent with the principles of constructivist theory in the fields of art education.



Examples of students' work in the post-experiment

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