

The Effectiveness of Using Visual Thinking in Developing Woodcrafts Design and Implementation Skills Among Students of the College of Education, King Faisal University

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ABSTRACT

The research aims to identify the effectiveness of using visual thinking strategy in developing the skills of designing and implementing woodcraft among students of the College of Education at King Faisal University. The research sample consisted of 30 students for the control and experimental groups. The tools included a visual thinking strategy and a scale for assessing the skills of designing and implementing the woodcraft. A function at the level of (0.01) between the average scores of the scale of the skills of designing and implementing the woodcraft between the two groups (experimental and control) for the benefit of the experimental group, which indicates the effectiveness of the visual thinking strategy in developing the skills of designing and implementing the woodcraft for the experimental research sample of (15)

Keywords:

Visual Thinking, Art Education, Woodcrafts, Design Skills.

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I.INTRODUCTION

The creative effort and the human experience is an attempt to form the raw material to become the true essence of the creative work, as the material itself contains an aesthetic value and sensory qualities that will help to clarify the expressive content through the different artistic formation methods. Thought and the most important pillar of creativity as well as framing our behaviors, as it is an intellectual activity related to other mental processes, such as perception, attention, and remembering, and its relationship to fluency, flexibility, and originality. Therefore, educational institutions are interested in developing thinking skills because of their importance in confirming the awareness of the learner by opening the way for the practice and attainment of different types of critical and innovative thinking.

God Almighty has endowed man with the five senses to be his tools in obtaining knowledge and making the mind an administrative device capable of effecting interaction between these senses, and the perceptive eye is one of the tools of

the mind in obtaining visual knowledge, and this is what is known as visual thinking or what is known as (the eye of the mind and the mind of the eye). "There is a difference between the mind as an administrative device and the realization of the spirit of the mind in solving the problems facing the designer to achieve the best and most beautiful solutions during the procedural processes of design" (Abdel Karim, 2013, p.5). The eye represents one of the entrances to receive knowledge from the surrounding world, as it is a human's camera that takes pictures of what is around him, so the mind interacts with what is received according to his nature.

Thinking and the realization of the mind is a necessary goal that should be at the forefront of our educational goals for all academic subjects, and for that goal, teaching methods, activities, educational aids, and evaluation processes that help to achieve it must be employed, and visual thinking is one of the most

important types of thinking as it depends on what the eye sees and what follows that. From processes, occurring inside the brain from analyzes and comparisons up to the effect of this interaction remaining in the human memory for a period that exceeds the survival of the effect resulting from any other type of thinking (Al-Masry& Amer 2016, p.19).

Visual thinking deals with its material through abstract inference processes with the application of some logical relationships such as the significance of shapes and importance Relationships between them. (Abdel-Hamid, 1997, p.49).

Perhaps art education and its many fields, including wood-crafting, place thinking in its various dimensions (systemic, visual, and creative) as foundations in building its educational goals that help in moving the intellectual faculties of analysis and synthesis skills and the ability to solve problems innovatively based on visual thinking, when practicing the activity The technician passes through many situations that require him to decide to organize the visual elements of the artistic work and the techniques it requires, realizing the aesthetic values, so he organizes, reorganizes, decides and changes the decision as a result of his conscious existence related to his own experiences depending on a complex mental activity until it reaches Satisfactory result, visual thinking is based on building visual information and what information is sent to the brain for processing and the subsequent mental activity and interaction with what has been seen.

Research problem:

In recent times, there is increasing interest in the need to develop and open up awareness among students by activating thinking mechanisms in a way that helps them to play a positive role in collecting, organizing, following up, and evaluating information during the learning process. Awareness can be developed through thinking among students in different patterns, including

visual thinking that depends on the sense of sight with the help of various visual materials such as pictures, symbols, and drawings.

Numerous scientific research results have emphasized the importance of using modern educational strategies that depend on thinking and the realization of the mind and senses to achieve the desired educational goals versus strategies that depend on memorization and indoctrination, these studies include the study of (Al-Ankara, 2017), (Al-Dardi, 2018,p.1:16). and (Taha, 2018, pp.163:202) Hence the problem of the current research based on the results and recommendations of those studies to test the effectiveness of teaching technical skills using strategies based on their scientific basis on the thinking approach, specifically visual thinking as an important and necessary requirement in modern education compared to traditional education through The various educational courses, especially the wood crafting course, which aims to exploit the remnants of wood, its formal and plastic capabilities, and expressive dimensions, to reveal through the depth of vision, contemplation, innovative thinking, research and experimentation, and the exploitation of waste for the make of woodcraft depends on the perception of formal relationships, systems of structures and design formulas. In light of this, the research problem can be summarized in the following question:

- What is the effectiveness of using visual thinking strategy in developing the skills of designing and implementing woodcraft among students of the College of Education at King Faisal University?

Research Hypotheses:

1. There are no statistically significant differences between the mean scores of the research sample (experimental and control) on the scale of wood-crafting design skills.

2. There are no statistically significant differences between the mean scores of the research sample (experimental and control) on the scale of woodcraft implementation skills.

Research objectives:

- Making use of the forms of wood waste in developing the design skills of the woodcraft for students of the College of Education using visual thinking.

- Measuring the effectiveness of using visual thinking strategy in developing the skills of implementing the woodcraft "among students of the College of Education, King Faisal University

Research importance:

- Experimenting with new strategies in the educational process and comparing it with traditional education and making use of the results in policies of adopting teaching and learning methods.
- Building a tool for measuring the targeted skills in designing and implementing the woodcraft, depending on the visual thinking strategy.
- Shedding light on the concept of visual thinking and its importance in building a thinking and creative generation by recycling wood waste.
- Developing experimental steps for a strategy of visual thinking that can be used in the field of education in art education.

Research methodology:

- The current research uses both of experimental and descriptive approaches.

Research tools:

- A Continuing visual thinking.
- A Scale for evaluating woodcraft design skills.

Research limits:

- A sample of research results on college students enrolled in the experimental group, (15) for the experimental group, and (15) for the study group for the second year of the year 2019-2020.
- The experimentation in research deals with the field of wood-crafting to produce crafts based on raw wood waste.

Research terms:

Educational strategy: "It is a long-term plan for multiple situations, used to teach a course or a unit of study, and it is more general and comprehensive than the method and the approach, as the strategy

includes more than one method of teaching to achieve long-term goals, which need time, follow-up and integration of experiences" (Taha & Mahmoud Ibrahim, 2010,p.40).

Visual Thinking: It is a purposeful, dynamic mental process based on reorganizing what we know in terms of symbols, concepts, and perceptions into new patterns in which we use decision-making, problem-solving and understanding of external reality" (AlKhazindar, Mahdi, 2006).

- It is "the individual's ability to deal with perceptible materials and distinguish them visually so that he has the ability to perceive spatial relationships, interpret information, analyze it and explain ambiguity" (Al-Shobaki, 2010,p.35).

Woodcraft design and implementation skill (procedural): The students' ability to find a set of compositional formulas for wood waste characterized by accuracy and precision to build woodcraft, taking into account the technical treatments of the wood material.

Research procedures:

1. Collecting information through research and studies related to the research topic.
2. Linking and coordinating information to define and write the theoretical framework for research and its related literature.
3. Design and construction of research tools, represented in: (visual thinking strategy - a scale for assessing the skills of designing and implementing the woodcraft).
4. Arbitration of research tools by specialists.
5. Legalization of the research tools by applying them to the 15-rationing sample.
6. Determine the control sample and the experimental sample, by (15) students for each of them.
7. Applying the visual thinking strategy to the experimental sample of the research.
8. Post application of the search tool after completing the implementation of the strategy.
9. Conducting statistical analysis of the results of the application.
10. Interpretation of results.

II.THE THEORETICAL FRAMEWORK:

Concept of visual thinking:

vision is considered the largest part of brain physiology, and approximately 50% of brainpower is directed towards visual function, either directly or indirectly, so the brain's processing of the image is less complex than the raw text processing (Mansour, 2015,p.126:176). and since visual thinking is based on experimental research, it works to develop students' abilities in translating visual language, developing communication skills, creative and logical thinking, dealing with ambiguity, diversity of opinions, and the development of perceptions through discussions that take place across Its operations to develop aesthetic practices. (Khalif, Ali Majid, 2015, p.676).

It is noted that most of the definitions presented in studies of visual thinking are related to concepts such as logical thinking / conceptual thinking/thinking related to the right side of the brain and the learning that occurs with the processing of visual information. (Mange, 2015), and visual thinking also depends on organizing ideas, quotes, and pieces of information in a visual way; which usually includes diagrams, mind maps, and record drawings.

Visual thinking a pattern of thinking that includes the ability of the individual to visualize objects and shapes in different situations through simple and complex transformations such as reflection, rotation, and transition, or operations such as bending, straightening, deleting, adding, cutting, distinguishing and interpreting visual symbols to identify the faces The similarities and differences between them, and the analysis of the visual position to come out with visual conclusions and connotations, to organize mental images and to reconfigure the visual position to produce meaningful visual models. (Hamed, El-Kabbani, 2011, p.25).

It is a system of processes that the mind uses to organize its experiences in a new way to solve A specific problem so that this system includes the processes of perception of the relationship between the introductions and outcomes, and the processes of perception between the cause and effect, general

and specific, and the known and the unknown, and this system is purposeful and directed to achieve an intended goal. (Mahdi, 2006, p.14). It is thinking that depends on what the eye sees and the subsequent processes that take place inside the human brain Figure (1) from analyzes, comparisons, and imaginations, leading to the survival of the effect of this interaction in the human memory for a period that exceeds the survival of the effect resulting from any other type of thinking And - Piaget - believes that visual thinking is a mental capacity that is directly related to the visual sensory aspects, where this thinking occurs when there is mutual harmony between what the learner sees in terms of shapes, drawings and relationships and what happens in terms of linking and mental outcomes based on the vision and the presented drawing. (Al-Masry& Amer, 2016, p. 57).

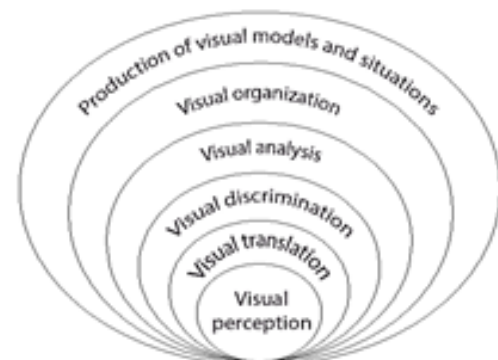


Figure 1 *Sub-capabilities of visual thinking*

The importance of visual thinking

The technological and industrial revolution has made the image a goal and a means to control the human mind, and here the importance of visual thinking appeared in increasing the mental abilities of learners. Al-Masry& Amer 2016 and Muhammad 2004, listed some of the benefits that highlight the importance of visual thinking, including the following:

1- It opens the way for practicing different types of thinking, such as critical thinking and innovative thinking.

2- It helps to understand and realize what is going on in the environment surrounding the person.

3- It plays a prominent role in creativity and innovation, and many scientists have used this type of thinking for their innovations.

Besides, visual thinking, when presented collectively, helps learners learn better and provides many benefits, the most important of which are the following: (Al-Masry & Amer, pp. 63, 64).

It improves the quality of interaction between students.

It enables the work team to better commit and produce.

Supports new ways to exchange ideas.

Helps gain deep understanding and new perspectives.

- Works to accelerate learning while carrying out educational tasks.

4- It helps in developing engineering thinking at its three levels, namely: (visual thinking, descriptive thinking, and abstract thinking)

5- It develops the various science processes such as (observation - analysis - interpretation - conclusion).

Al-Munir also confirmed the existence of an interactive relationship between generative thinking and visual thinking, which adds to the importance of visual thinking in the educational process, as visual information represents a large part of the information through which we reach inferences (the exploratory aspect of generative thinking) (Al-Munayer, 2015, p.16).

Visual thinking skills:

Visual thinking skills are defined as a system of processes that translate the individual's ability to read a visual figure and convert the visual language that that shape carries into a verbal language, written or spoken, and extract information from it. (Mahdi, 2006, p.23). According to Cyrus, visual thinking consists of the overlapping of three skills: visualization, vision, and design. Figure (2)

In addition, branched from these three main skills the following sub-skills: (Cyrs, 1997, p.27).

- Reading skill and visual discrimination: it means the ability to recognize a shape, determine its dimensions and nature, and distinguish it from other shapes or images.

- The skill of shape analysis: It is the ability to see the relationships in the form, determine the characteristics of those relationships, classify them, relate the elements of relationships in the form and find compatibility between them.
- The skill of perceiving spatial relationships: the ability to see the relationship of influence and influence among the locations of the phenomena represented in the shape of the displayed image.
- The skill of interpreting information: the ability to clarify the meanings of words, symbols, signs, and shapes, and bring closer relations between them.
- The skill of inferring meaning: means the ability to extract new meanings and arrive at scientific concepts and principles, through the shape, image, or map presented (Al-Kahlout, 2012, p.33). (Al-Shobaki, 2010, p.36:37). (Al-Huwaidi, 2008, p.139).

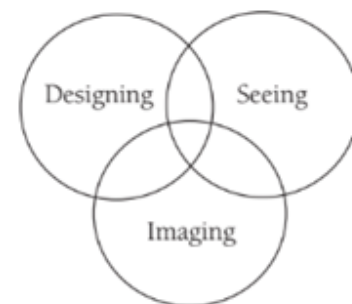


Figure 2 *Visual thinking skills*

Visual thinking mechanism:

Visual thinking depends on the shapes, drawings, images presented in the situation, and the real relationships involved in it, trying to find meaning in the contents in the front of it. (Al-Afoun, Abdel-Saheb, 2012). This type of thinking depends on what the eye sees and what is sent from a tape of information that is continuously occurring to the brain where it is translated, processed, and stored in the memory for later processing. (Hashad, 2010, p.1657).

Visual thinking processes:

Visual thinking depends on two processes: (Abdel-Karim, 2001, p.542).

- **Sight:** through the learner's use of the sense of sight to recognize things, locate them, understand them, and direct them to what is around him in the surrounding world.
- **Imagination:** the process of creating new images and mental imaginations in light of previous experiences, and preserving them with the mind without using visual stimuli. The basis of cognitive processes is vision and imagination, where the visualizations are converted from the eye into three components of imagination: modeling, color, and movement.

Visual Thinking Tools: (Hashad, 2010, p.1659).

- A. Symbols: They may have abstract, natural, or direct connotations.
- B. Image: Visual thinking requires the presence of the image, as the image is the basic building block in visual thinking.
- C. Multimedia: Including educational films, Effective presentation programs, and mind mapping programs.
- D. Diagrams: These are mental maps or mind mapping that link the external visual shape and the internal performance of the human mind.

Visual thinking and experimentation:

Artistic workshops are rich in many wooden wastes coming from different manufacturing processes, and these wastes and residues have great benefits as they are considered some raw material rich in different surface, color and shape values that need to be meditated and understand what shapes are and how to restart them and work to benefit from them, and open experimental entrances through recycling them.

Experimentation is one of the sources of artistic perception in our modern era, as it allows the logic of thinking, its bifurcation and continuity, and is subject to a rational will and organized steps away from spontaneity and chance.

Experimentation in wood is a starting point for plastic alternatives to woodcraft through formulas, structures and relationships. Creative thinking and divergent thinking grow among the student with the aim of reaching multiple

possibilities and gaining him fluency in design and plastic solutions for the same workmanship and for the same materials, so ideas crystallize, choose alternatives, and combine wood waste in new formative relationships. (Ali, Ali, 2017, p.6).

In light of the trends and calls advocated by plastic art to liberate from material limits and maximize opportunities for benefiting from consumables and reformulate them, the importance of visual thinking as an entry point to arrive at synthetic systems characterized by creativity, which works to develop the level of artistic sense and aesthetic values of students through the activation of visual thinking skills.

Visual thinking and woodcraft design skills:

Wood waste possesses the forms that impose itself on the artist and he must take the artistic and technical methods and design formulas appropriate to build the structural composition of the woodcraft, so the artist here gives a second life to the waste through artistic creation, contemplation, and conscious visual perception, so he puts his touches, diversifies his experiences, expands his artistic visions, and then gives The woodcraft its own privacy, which achieve aesthetic pleasure and raise the recipient's awareness and visual taste. In addition, for that, the artist should have the following skills: -

1- Visual thinking skills.

2- Technical skills, plastic treatments, implementation skills, and approaches to experimentation with wood depend on the experimental and personal experiences of the student.

3- Design skills that include many concepts and rules of formation in expressing feelings and the foundations of design in building their shape, and the analysis of the relationships of the parts of the design to each other.

Design Elements of Woodcraft:

Often the elements of all 3D bodies consist of blocks and spaces governed by relationships called space tension. Mental perception and the material in the woodcraft plays a major role in determining the content of the mass and its meanings, and the effect on the mass comes through plastic treatments

and the precision in choosing the material executed with it.

As for space, Gabriel defines it as "a space without matter, and it represents the second element of the object and plays a major role in showing the aesthetic value of the work, depending on the artist's awareness of the concepts of harmony between the aesthetics of the space and the woodcraft" (Gabriel et al. 1965,p.42).

The third element of the design of the woodcraft, it is the space tension - which can connect the volumes as if they were a bond or link force. This means that there is a close connection between the harmony of the woodcraft elements and the aesthetics of the space, and "the space tension is achieved in the three-dimensional woodcraft. Methods, including facets contact, superposition, or deletion and addition. The aesthetic value of the space is attributed as it regulates the first movement of joining and grouping in three-dimensional shapes, whether geometric (such as a cube, cone, cylinder, etc.), or other regular shapes, the degree of their connection to each other depends on the amount of space tension between them". (Scott, 1980, p.31).

Sources of structural construction of the stereoscopic Woodcraft:

(Allam Mahmoud Allam) determined the dimensions and levels of the three-dimensional formation according to the following sections: (Figurines based on elementary geometric formations - shapes inspired by living things - figures based on the formations of anthropomorphic nature - figures inspired by abstract organic shapes), This diversity comes due to the diversity of bodies, shapes, and motives that nature abounds in with all its components and structural systems, and the diversity of ideas, concepts, and art forms In which every artist tries to express what he sees, whether realistically, imaginatively or abstractly.

Elementary geometric compositions as a source for the construction of the Woodcraft:

The elementary geometric compositions mean the figures that depend in their compositional construction on simple three-dimensional

geometric shapes such as cone, cube, ball, and other symbols that belong to those shapes, and these geometric models have been widely used in the abstract arts, especially in the constructionism as an artistic movement that contained in its content several Artistic trends like Cubism, Futurism, and Suprematism.

The cone, circle, cylinder, and cube are among the elementary models whose shapes converge from the three-dimensional wooden waste forms (the field of research), and through the student's awareness of the formal data for each of them, the student produces multiple and variable shapes that are easy for the student to use in the artistic works that depend on their construction on the three-dimensional shape and its analyzes.

Visual thinking and implementation skills: -

The technique and method used in wood processing within the artwork are no less important than the design, as they complement each other, and indicates the skillful and technical mastery of all aspects related to the woodcraft, whether in design or implementation. (Ramla & others., 2018, p. 41). The field of operating the wood remains, the subject of the study, opens up to our many approaches to experimentation, as it requires the ability to analyze visual elements from the line, shapes, and mass to build the formal body of the woodcraft. Wood leftover possess an infinite number of forms that impose themselves and compel the practitioner to deal with them, generate ideas and organize the mental image that revolves around shapes and lines through simple and complex transformations such as reflection, rotation, and transmission, techniques used in operating the surface of the wood and fixing these shapes in an orderly manner, trying to form the visual position, and during all this it evaluates the plausibility of ideas, formative solutions, and structural systems in building structural shapes and reading Its aesthetic dimensions deal with the shape and the material, in light of the aesthetic and plastic standards.

"The structural design of the 3d form is not just a study of how to build only with its importance as a way to identify what this shape will look like

if it is viewed from any side. If the practitioner is looking in the framework of static relations when his work is two-dimensional, then he must put In considering the dynamic kinetic relations in the formation when viewed from one side only, he must also ensure that this balance is achieved by those who view it from more than one side ”(Riyadh, 2000,P.501).

The implementation skills of the woodcraft are linked to the artist ability to implement various techniques in wood shaping, the most important of which are: cutting-drilling-interlocking-carving-

gluing, as the correlation is an imperative between performance, technique, and plastic treatments used, and skill is a means that the practitioner can adapt according to the work requirements, so everyone is subject to the work structure. It is subject to modification and alteration, and to adapt to the requirements of innovation (Al-Meligy, 2003, p. 203).

Through the presentation of the previous theoretical framework, the researchers concluded: - First: the skills intended to be developed through applying the proposed strategy Table 1.

Table 1 The proposed strategy for developing Woodcraft design and implementation skills

Axes		Items
Woodcraft design	Configuration	The ability to properly design and build an artwork structure
		Distributing the external lines and elements of the artistic composition in a thoughtful rhythmic sense that achieves the formal and color proportions in the unity of the artwork.
		Divide the flat design into a mathematically and aesthetically compatible geometric system
		Selection of wooden motives that is compatible and homogeneous with each other and suits the design idea.
		Achieve a compact composition based on appropriate design constructs and aesthetic criteria for the composition.
		Innovation in configuration and design outline.
	Formulations and Relationships	Appropriateness of the design formulas for the construction of the motives of the work and the nature of the material (superposition - contact - capture - repetition)
	Design elements	Employing design elements (point - line - area) in achieving various linear and texture relationships within the design.
Executing the woodcraft	Fluency	The multiplicity of non-traditional artistic ideas and their clarity within the work piece.
		Employing formal fluency by linking the waste form with forms of nature or imagination.
		The range of diversity in materials, formulations and relationships within the work piece

	creativity	Flexibility	Changing and adapting artistic ideas to suit the nature of the available artistic materials.
			Adapt the techniques used and their alternatives to suit the idea, the subject and the nature of the material.
			Use wooden shapes and sections in a variety of ways to highlight the ideas targeted in the artwork.
		originality	Uniqueness of work.
			The clarity of renewed thinking in the two dimensions of design and implementation.
			Synthesis of materials and colors in innovative ways that serve the idea and purpose of the artwork.
		A departure from the ordinary	Freedom from traditional ideas and methods of dealing with the artistic topic.
			Daring to use wooden waste and create aesthetic relationships between them.
			Employing the material in unfamiliar ways to create the artworks
			A distance from traditional technical formulas and relationships.
		The imagination	Creating shapes and designs that do not necessarily relate to reality.
			Non-compliance with the logical associations between materials, shapes, and colors.
	Designing shapes and figures that express characters, mythical animals, or future shapes (strange fairy-tale creatures and figures).		
	Aesthetic values	Diversity	Ensure the diversity between the components of the artwork.
			Avoid repetition in design or artwork components as much as possible to avoid boredom.
proportionality		Preserving the proportions and details of the artwork	
		Maintaining the placement of every part of the artwork in its correct place.	
		Fit the core and composition of the artwork with its purpose (hanging woodcraft)	
balance		Achieve artistic balance through the consistency of the distribution of lines, shapes and textures within the design	
rhythm	Achieve artistic rhythm within the design by repeating the wooden motives and the lines, spaces and colors they represent		

		Unity	Achieve theme unity through the harmony of wooden units.
		satisfaction	Spend more time exploring and contemplating the aesthetics of an artwork.
			Not to feel bored and reflect on work.
			The artwork reflects the extent of understanding and a taste for meaning and aesthetic connotations.
			Ensure that the artwork is linked to the community's values, reality and identity.
	Technical skills and finishing	Techniques	Diversity in wood processing techniques (cut-hole-interlock-rasp-stick)
			Accuracy in implementing the techniques used
			Appropriateness of the techniques used to achieve constructivism woodcraft according to design.
		Finishing	Accuracy in finishing the woodcraft. (Sanding - painting.)

Second: Determining the general objectives of the strategy's activities, which are:

1. Integration of students' visual abilities with other senses.
2. Infer visual formation relationships.
3. Development of students' abilities to generate varied variants of the design and implementation of the woodcraft.
4. Development of wood crafting design skills.
5. Developing the skills of implementing the woodcraft.

Tools:

1. **Visual thinking strategy:** as shown in the previous table.

A- The general objective of the strategy: employing students' visual ability in an integrated manner with other senses, which leads to the development of sensory perception and generating numerous and varied formal technical alternatives, which help in mastering the skills of designing and operating wood remains using visual thinking skills.

B - Visual thinking skills that underpin the strategy: visual discrimination - recognition of formal relationships - analysis of form elements -

interpretation of formal relationships - production of new relationships.

C- The theme of the strategy: creating a woodcraft piece for hanging on the wall using raw materials (leftover wood).

D- Defining the targeted technical skills: (woodcraft design skills-woodcraft technical skills - artistic creativity - aesthetic values).

C- Educational Means: According to the foundations of the strategy, images and videos of the targeted technologies were used.

2. Scale of assessing the skills of designing and implementing woodcraft:

a. The scale set up Steps:

- 2-1 Specify the objective of the scale, which is to evaluate the work of the research sample in the technical and creative design skills of woodcraft, as specified in the scale items. Appendix (2)
- 2-2 formulating the scale items through the researchers' experience and reviewing some technical assessment measures in the field of woodcraft and design.
- 2-3 Amending and deleting some clauses based on the opinion of the arbitrators (Appendix 3).
- 2-4 The scale in its final form Appendix (2)

B. Validity of scale: The validity of the scale was calculated by validating the internal consistency of the scale items. The internal consistency validity coefficients ranged between (0.882) and (0.948), which are high coefficients indicating the validity of the scale.

C. **Stability of the scale:** The researchers used re-correction after 15 days had passed since the first correction, then the correlation coefficient between scores was calculated both times, reaching 0.825, which is a statistically significant coefficient at the level of 0.01, which confirms the stability of the scale.

Table 2 Differences between the mean scores of the Woodcraft Design Skills Scale between the two groups (experimental and control)

Measurement	Sample	M	SD	T. test	Sign
Control group	15	42.83	2.72	25.24	0.001
Experimental group	15	75.91	3.39		

Through Table (2), it is evident that there are significant differences at the level of (0.001) between the average scores of the woodcraft design skills scale between the two groups (experimental and control) in favor of the experimental group, which indicates the effectiveness of the strategy in developing wood crafting design skills among the research sample.

Statistical processing: The statistical program (spss) was used to treat data statistically.

Research results:

In light of the Hypotheses, the results can be summarized in the following points:

1. There are no statistically significant differences between the mean scores of the research sample (experimental and control) on the scale of woodcraft design skills.

To verify the validity of the first hypothesis, the differences between the average scores of the woodcraft design skills scale between the two groups (experimental and control) were calculated.

2. There are no statistically significant differences between the mean scores of the research sample (experimental and control) on the scale of woodcraft implementation skills.

In order to verify the validity of the second hypothesis, the differences between the average scores of the scale of skills for implementing the woodcraft between the two groups (experimental and control) were calculated.

Table 3 Differences between the average scores of the woodcraft implementation skills scale between the two groups (experimental and control)

Measurement	Sample	M	SD	T. test	Sign
Control group	15	169.25	15.92	31.38	0.001
Experimental group	15	323.33	3.44		

Through Table (3), it is evident that there are significant differences at the level (0.001) between the average scores of the scale of skills of implementing the woodcraft between the two groups (experimental and control) in favor of the experimental group, which indicates the effectiveness of the strategy in developing the skills

of implementing the woodcraft among the research sample.

III.RESULTS DISCUSSION

The researchers referred to the results of the first and second hypothesis, which confirmed the effectiveness of the visual thinking strategy in developing the skills of designing and

implementing the woodcraft in the research sample to the role of visual thinking and its practice that frustrates mental abilities where visual thinking plays a prominent role in the higher levels of thinking and creativity, which are among the most important components of Plastic art production, as visual representations played a role in synthesizing information and clarifying relationships, which is

the basis for using pictures and videos as tools in strategy, which helped to clarify concepts to students, especially abstract concepts, which helped in the ease and perception of information and its use in the perception of relationships and techniques to produce woodcraft in new and innovative plastic formulas.

Figure 3



Figure 3: Models of students' work in the experimental and control groups

It also confirmed the results of some studies, including (Al-Munir, 2015,p.16), which confirmed the relationship between visual thinking and the generative thinking aspect of new artistic formulas and formations, as visual thinking deals with its material through abstract inference processes with the application of some logical relationships such as the meaning of shapes And the importance of the relations between them (Abdel-Hamid, 1997,p.49).

The students also went through many situations that require him to decide to organize the visual elements of the artistic work and the techniques it requires, realizing the formative values and the resulting aesthetic values, so he organizes and reorganizes, decides and changes the decision as a result of his conscious existence linked to his own experiences depending on a complex mental activity until it reaches The satisfactory result, as visual thinking is based on building visual information and what information is sent to the brain for processing and the subsequent mental activity and interaction with what has been seen.

The results of the current research are also in agreement with the results of using visual thinking as programs for visual arts in elementary school curricula by (Housen Abigail) -genuine (Philip) according to the standards of the US state of Florida and intelligence, and the most important results of its results are the improvement of the literacy skill of students while mentioning That the psychologists (Gestalt) are Sheehan & Baehr 2002, as they are the first to deal with visual thinking in application and study, in the term of the twentieth century. These scientists studied how a person uses his eyes to see the overall pictures of things and to recognize and locate objects (Amer & Al-Masry, 2016, p.53:55).

Research recommendations:

- 1- Thinking should be at the forefront of our educational goals for any subject because it is closely related to all academic subjects and the accompanying methods of teaching, activity, educational aids, and evaluation processes.
- 2- Utilizing the results of the research in disseminating the advantages of modern strategies and comparing them with traditional education.

3- Spreading the culture of recycling waste because of its aesthetic and economic impacts on the individual and society.

4- Paying attention to the means that depend on the sense of sight, including videos and pictures, because of their positive effects on the process of skills formation.

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