



## **Design and Implementation of Murals for the Art Education Department Atelier in the Faculty of Specific Education at Ain Shams University to Achieving Design Principles with Second-Grade Students**

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### **Abstract**

Design and Implementation of Murals for the Art Education Department Atelier in the Faculty of Specific Education at Ain Shams University: Achieving Design Principles with Second-Grade Students

**Research problem:** Rehabilitation and beautification of the University Environment Affairs Sector at Ain Shams University by creating murals that achieve design principles.

**Research objective:** To detect the relationship between the design and implementation of murals in the university hostel of Ain Shams University and to achieve the principles of design of a sample of male and female students of the second grade, Art Education Department, the Faculty of Education for Specific Studies.

**Research hypotheses:** There is a positive relationship between designing and implementing murals and achieving the principles of design principles for a sample of the second-grade students, Art Education Department, the Faculty of Education for Specific Studies, Ain Shams University.

**Research methodology:** the experimental methodology (preliminary design) with one group of post measurement.

**Research tools:** a form for achieving the design principles in the mural works (prepared by the researcher).

**Research results:** 4 murals were designed and implemented with distributing them over four floors in the Republic Building in the University hostel. Experts have agreed that the principles of design were achieved at rates ranging from 79% to 92% by applying four lessons distributing over 13 interviews of 78 hours.

**Keywords** - Faculty , detect, implementing, measurement.

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## Introduction

The mural serves as a cohesive artistic system, bringing together a variety of skills that showcase the artist's experiences and capabilities by illustrating human activities. Murals come in many forms, including historical and commemorative types.

Different perspectives reveal that the design of murals involves composite objects characterized by structural relationships, which offer solutions to philosophical problems in composition. Sanoff-Henry points out that several challenges face mural designers, such as:

(A) Selection of formal elements expressing the subject that suits the place.

(B) The basic structure of the composition, which helps in the formulation of elements and their link to the ideological contents, and the formulation of elements includes two aspects:

**The first aspect:** relates to the body and the system taken by the elements

**The second aspect:** related to the method of performance and technical processes through which vocabulary is employed and the system is embodied in colleges (Sanoff. Henry, 1991):

**Examples of mural works as stated in the results of one of the researches are:** (Abdel Wahab Mahmoud Abdel Wahab, 2012)

- Mural work, such as the mural of the railway station in Egypt by the artist Salah Abdel Karim, the mural of Rosa Al-Youssef by the artist Naji Kamel and the murals of the metro station by the artist Sami Rafi
- Flat and round murals such as the Cairo Tower mural and the Aswan Dam Tower mural are related to the nature of the architectural place
- Murals with levels

Flat murals, three-dimensional murals combining various elements. Today, mural paintings use diverse artistic styles and mediums, including oil paints, acrylics, sprays, dyes, and mosaic tiles. Murals not only decorate walls but also serve as tools for mass communication, expressing political and social opinions, and have become part of interior design for homes, offices, and halls. Generally, murals can be categorized into three main types. Research has shown that public murals can enhance community engagement and foster a sense of identity and pride among residents.

- 1- **Wall engravings** : as in decoration, architecture, etc.
- 2- **Murals:** They can be divided into historical murals, or what can be termed folk murals.
- 3- **Wall writings:** which can be divided into personal scribbles and slogans or political, social or cultural messages, and can be divided artistically into ordinary wall writings and other artistic, where artistic lines are used, traditional.

### Tasks of murals:

Murals can tell a story, highlight achievements, illustrate ongoing struggles, document significant events, or simply serve as decorative elements. They have specific origins, components, and placement conditions. Like sculptures and memorials in urban spaces, murals must harmonise with their surroundings in size and shape, align with the building's purpose or location, suit the local climate, and be easily viewable by passers-by. Recent studies suggest that public art, including murals, can positively impact community well-being and social cohesion (Smith, 2020).

Some researchers have carried out scientific studies dealing with mural painting through a number of variables, and obtained important results that benefited the current research, such as (Imad Farouk, 1995) a study entitled Structural Foundations in Anthology of Contemporary Art Murals as an Entry Point for Enriching Decorative Painting. One of its results is that when implementing the mural, the designer

artist faces several problems, including the selection of formal elements that express the place and the formative construction of the formulation of the elements and their link to the contents.

(Mutasim Hussein Omar, 2009) entitled "Study of the documentary mural of historical figures from the city of Omdurman", dealt with the documentary mural of a number of historical figures from the city of Omdurman in the paragraph from 1920-1970 AD. The study also clarified the concept of mural and the multiplicity of its types, specifically in the framework of research and also the study provided an overview of oil colors and their uses technically in the framework of research as indicated to the aesthetic and moral addition to the spread of this type of photography, which has a positive impact on raising public taste. He pointed out in The results presented by the researcher that the mural is more influential on the largest number of viewers at one time.

(Ola Ahmed Youssef, 2009) study entitled: The symbolic dimension and plastic construction in contemporary photography "The study dealt with the skills of visual perception of the symbol in photography, the concepts of the perceptual process of the symbol. Organizational standards The cognitive process of the symbol, including the sensory perception of the symbol and the dimensional perception of the symbol, and the aesthetic perception of the symbol and the exit of the organizational standards as an entrance to the symbols, including: An overview of the linearity of the symbol Analysis of the situation and the perception of the relationships between the parts of the symbols, the reconstitution of the parts and the return to the overall view.

(Salama Muhammad Ali, Muhammad Al-Shorbagy et al, 2012) In a study entitled "The Impact of the Aesthetic Vision of Sculptural Murals on the Development of Artistic Taste among Young People", the study aimed to present and analyze the meaning, sources and characteristics of sculpture, clarify the relationship of sensory, visual and aesthetic perception with (wall sculpture), and provide the most important factors that help in realizing the aesthetic vision of the three-dimensional mural. The study concluded that the process of visual perception is an upward process in which subjective factors are mixed with objective factors continuously and is considered the visual perception and the results of the effectiveness of harmony with the surrounding external factor,

(Hassan Hassan Taha, 2016) conducted a study entitled "Technical Methods of Linear Design as an Experimental Approach to the Design of Contemporary Independent Murals", which aims to describe and analyze the artistic methods of linear design to extract the technical foundations and structural systems on which they are based. And find an experimental approach to take advantage of these Artistic foundations and structural systems as inspiration for the design and beautification of contemporary independent murals with the help of computer programs. And the exit of Arabic calligraphy from the space of flatness to the space of anthropomorphism (mass and space) through the connection and marriage with the art of independent murals. The study found that it is possible to develop heritage forms, represented in the artistic methods of linear design to reach renewal and contemporaneity through experimentation and access to a new approach through innovative solutions for linear design in the form of independent linear murals,

(Saad Al-Sayed Al-Abd, 2017) conducted a study entitled "The Role of Visual Arts in Deepening the Artistic Vision and Developing the National Awareness of the Recipient (An Analytical Study of the Aesthetics of the Burullus Experience of the Artist Abdul Wahab Abdul Mohsen Foundation for Culture, Arts and Development)", which aimed to Revealing the positive role of the Burullus photography experience in enriching the artistic vision and the visual and aesthetic stock of the recipient and revealing the educational and social role of mural photography in developing the general taste of the residents of the Burullus area and developing their national awareness. The study was also interested in identifying the message of the artist Abdul Wahab Abdul Mohsen Foundation for Culture, Arts and Development and its objectives, which aims to activate art in society and improve public taste and shed light on the experience of Al-Burullus and its role in enriching the artistic vision and the visual and aesthetic stock of the people of the region.

(Rasha Ahmed Suleiman, 2019) With a study entitled "Visual Technology Technology and its Impact on the Development of Contemporary Murals", the study aimed to clarify the importance of using digital technology in artistic work, and how the field of visual vision expands significantly for research, experimentation and interaction with all new data, and concluded that there are vigorous attempts to invest digital technology in the fields of science and various arts. Technological applications have changed the shape of cities and streets now, and they give the viewer the opportunity to see The artwork and interact with it in a different way, as it could feel that it is part of it.

(Islam Haiba, 2013) conducted a study entitled "The artistic and aesthetic values of environmental design and their role in enriching the civilized side of cities and villages" and the study aims to pay attention to the aesthetic values and decorative pattern that the environment around us must be and exploit the raw materials of the environment and benefit from them in two paragraphs and recycle them in the environment.

(Wael Abdel Hamid Anwar 2020) With a study entitled Symbolic connotations and their relationship to aesthetic values in mural painting as an entrance to beautify public squares (a field study in um Kulthum Square in Dakahlia Governorate) The research aims to reveal the importance of symbolic connotations and their relationship to aesthetic values in the construction of pictorial murals in the fields and find an entrance in the formulation of pictorial paintings to achieve modernization and contemporary in the work of art education students, and previous studies are the closest studies for current research, which can benefit from solutions to the problems included in these studies or related to its problem and objectives and its methodology.

The researcher was commissioned to develop the building of art education design atelier first floor

- (1) The interior area of the atelier in terms of its heights and dimensions.
- (2) How to process them artistically so that they become suitable for design.
- (3) Preparing the design that consists of design elements and units employed to achieve the foundations of the design.

In the current research, a number of (4) murals were designed and implemented, so the number of participants became 30 students who are the research sample, and half of the number of murals tended to the network direction in building the design painting through the color gradation of the paintings, and the procedures for designing and implementing murals were carried out by 13 interviews allocated to each interview 6 hours, so the total completion time for the 4 murals was 78 hours.

### **Search problem:**

The functions of the mural painting are multiple, between cosmetic, documentary, media and decorative, which makes it distinct from the rest of the fields of decorative design, and because some of the few buildings of Ain Shams University are aesthetically poor and lack a decorative and aesthetic sense on their walls, which prompted the university administration to try to clear this character and aesthetic sense through the design and implementation of a group of murals in which the foundations of aesthetic design are achieved among students of the Faculty of Specific Education Under the supervision of the researcher, the research problem is therefore summarized in the rehabilitation and beautification of the design atelier at Art Education Department Ain Shams University through the work of murals that achieve the foundations of design.

### **Research Objective:**

The research aims to reveal the relationship between the design and implementation of design atelier murals at the Faculty of Specific Education at Ain Shams University and achieve the foundations of design, I have a sample of students of the second year at the Faculty of Specific Education – Department of Art Education – Ain Shams University.

**Research hypotheses:**

There is a positive relationship between the design and implementation of murals and the achievement of the foundations of design for a sample of second-year students at the Faculty of Specific Education, Department of Art Education – Ain Shams University.

**Importance of Research:**

(1) Students understand the importance of the teamwork they do.

(2) The importance of employing design work to develop environmental awareness of artworks (Ferman, 1994) emphasizes the importance of using art education in environmental awareness in the curriculum, and teachers have done research in all disciplines, and used it to transform environmental education topics into studies aimed at directing positive behavior towards the environment and pollution problems.

(dyke, 1996) also pointed out that modern arts, sciences and educational curricula have a positive role in environmental changes, and many countries have been interested in developing projects, curricula and educational plans that achieve positive trends towards environmental awareness.

The use of the word "environmental" began in the nineties, where a vision that includes the environmental city, environmental management, environmental technologies and environmental architecture appeared for the first time in 1998, and the nature of development refers to the addition of the environmental factor in the design process and then focused on the details of environmental design practice such as the production system, individual product or industry as a whole.

The current research achieves the addition of the environmental factor in the design process, and it is expected that the topics of the murals subject of the current research will contribute to raising the level of artistic taste for student viewers and increase their motivation to belong.

**Research sample:**

The research was applied to 30 male and female students from the second year of the Department of Art Education, Faculty of Specific Education, Ain Shams University, because their curriculum is related to the subject of research (murals / foundations of design)

**Research Tools:**

A scale to measure the availability of achieving the foundations of design in mural works (prepared by the researcher) and consists of (7 to 8) items, namely linear rhythm / chromatic rhythm / proportions and proportions unit / equilibrium (see Appendices 2, 3).

**Research Methodology:**

- In the theoretical framework, the researcher follows the descriptive approach.
- In the applied framework, the researcher follows the experimental approach (preliminary design) with one group with dimensional measurement with the group of students of the research sample.

**Terminology:****Foundations of design:**

- The foundations of the design represent the main aesthetic objective that the artist is trying to achieve in a way that reflects the aesthetic and functional purpose of the work designed, loaded with the artist's subjectivity and expressive individuality (Ismail Shawky Ismail, 2000).
- There are many images and methods that achieve these design foundations, each with its own modalities that require the designer to take into account the image that conveys the intellectual or aesthetic message performed by the designer's artwork (Mustafa Mohammed Abdulaziz, 1992).

### **Mural Art:**

It is defined as the artistic term for photography that applies to walls, ceilings, floors (Wall painting) or (mural painting) with any technique used or any material that suits the wall such as fresco, mosaic, oil or other techniques and materials, and means design on the wall.

Mural art or murals as it is technically termed, is one of the fields of plastic art, and it leans on an artistic term with a long history and various aesthetic features, and mural photography comes under several specialized sources under the title (Wall painting) or (mural painting), which means painting on the wall for multiple purposes that may be documentary, symbolic or documentary, and may be purely aesthetic, and in general mural art has been associated with human conscience for expressing other components that derive their origins from many motives and references, stopping the social factor Foremost among them are actors, influencers and directors, as well as the historical and political dimension (Barakat Said Mohamed, 2008).

### **Design Atelier at the Faculty of Specific Education:**

It is the Atelier of the Faculty of Specific Education, Department of Art Education, Ain Shams University.

### **Second year students:**

It is equivalent to late adolescence, which begins at the age of 18-21 years, which is the stage from which the research sample was selected.

### **Stages of preparation and implementation of murals:**

Murals (4 murals distributed on the walls of the atelier) were applied and implemented so that there is a group of students for each atelier ranging from 7 students to 8 students, based on the area of the mural and the desire of the students, and this application has been done with the following steps:

I - Selecting the research sample from the students and students of the second year, Art Education Division, Faculty of Specific Education, Ain Shams University, and their number reached 20 male and female students, who were regular in participation until the completion of the murals.

II - Work was from nine in the morning until six in the evening, interspersed with breaks.

III - The students were divided into seven murals, and the number of students ranged between 7 to 8 students per mural.

**IV - It was agreed with the college administration that the theme of murals will be inspired by the school of optical illusion in the stage of building retinas, and the color stage is implemented through color gradation.**

V - The role of the researcher was to give the sample members the appropriate expertise in the design of the elements and the foundations of design associated with the mural.

VI - The students were watched, examined and discussed the origins of the paintings from scientific encyclopedias or from the information network, then the elements to be used were selected to design, enlarge and arrange the mural in a composition that takes into account the foundations of design, and this was repeated in each of the seven murals in the design atelier.

VII - The walls were cleaned of potholes, prepared and painted

VIII - The designs were transferred after settling on the walls through the projector.

IX - The designs on the walls were colored in white driton colors added to them dyes and color concentrates, and this requires them to have special and high skills in using the material and achieving all the experiences that benefited from it during the experience lessons.

X - After the completion of the implementation of the frescoes were all painted with an insulating material to prevent damage from erosion factors.

**Eleventh: Lessons:**

The lessons included (4) lessons (for each sample distributed on the four floors) distributed over interviews, and the number of 78 hours as follows:

**The preparation of the lessons and associated results are as follow :**

**Lesson one**

Subject	The beginning of the design		
Domain	design		
Time	Lecture (6 hours) in the first week		
Age Group	second Year (18-20 Years)		
Teaching aids	Materials & Tools	Basic concepts	Goals
<ul style="list-style-type: none"> <li>- Pictures of some of the artists' works that has the optical art designs like Victor Vasarely</li> </ul>	<ul style="list-style-type: none"> <li>- Sketch</li> <li>- pencil</li> <li>- Ruler</li> <li>- Aristotle's Triangle</li> </ul>	<ul style="list-style-type: none"> <li>- Rhythm</li> <li>- Line</li> <li>- Point</li> <li>- color</li> </ul>	<ul style="list-style-type: none"> <li>- be a</li> <li>- Be able to analyze initial forms.</li> <li>- Be able to construct grid</li> </ul>
Strategy used		Lesson Progress	
Brainstorming		<ul style="list-style-type: none"> <li>- At the beginning of the lecture, the researcher throws some interesting questions to motivate students to the topic of the current lesson through brainstorming.</li> <li>- A general explanation is made of what design is and what are the basic concepts and elements of design.</li> <li>- Each student is required to make five innovative design based on the geometric and organic grid</li> </ul>	
It occurs whenever the student issues a desired behavior, and the reinforcement will be material and moral			Strengthening

What difficulties did the student face while doing the lesson and how to overcome them	Correction
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### Lesson Three

Subject	Project implementation		
Domain	design		
Time	Lecture (6 hours) X 9days		
Age Group	second Year (18-20 Years)		
Teaching aids	Materials & Tools	Basic concepts	Goals
<ul style="list-style-type: none"> <li>- Pictures of some of the artists' works from op art school like Bridget Riley, Richard Anuszkiewicz, Marina Apollonio</li> </ul>	<ul style="list-style-type: none"> <li>- Sketch</li> <li>- pencil</li> <li>- Ruler</li> <li>- Brush</li> <li>- Wall colors</li> </ul>	<ul style="list-style-type: none"> <li>- Rhythm and unity, Balance</li> <li>- Line</li> <li>- color</li> </ul>	<ul style="list-style-type: none"> <li>- be a</li> <li>- Be able to analyze initial forms.</li> <li>- Be able to choose color to get the compatible color</li> </ul>
Strategy used		Lesson Progress	
Brainstorming		<ul style="list-style-type: none"> <li>- At the beginning of the lecture, the researcher throws some interesting questions to motivate students to the topic of the current lesson through brainstorming.</li> <li>- Discuss what is the unity and the foundations of the balance</li> <li>- Begin implement the designs on the walls using direct drawing</li> </ul>	



		<ul style="list-style-type: none"> <li>- Begin to paint the colors in the shapes and the units of the grid that they draw</li> <li>- Students are divided into murals to start implementing the project</li> <li>- Students are always directed during implementation on how to mix and prepare colors and how to use a wall paint brush</li> </ul>
It occurs whenever the student issues a desired behavior, and the reinforcement will be material and moral		Strengthening
What difficulties did the student face while doing the lesson and how to overcome them		Correction

Lesson	Lesson topic	Interview time	Number of interviews	Total Hours
<b>The first</b>	Start designing	6 hours	1	6 hours
<b>Second</b>	Choose colors and start implementing	6 hours	2	12 hours
<b>Third</b>	Implementation of murals	6 hours	9	54 hours
<b>Fourth</b>	Mural finishing	6 hours	1	6 hours
<b>Total</b>			13	78 hours

## Lesson two

Subject	Choosing color and begin in the project		
Domain	design		
Time	Lecture (6 hours) X 2days		
Age Group	second Year (18-20 Years)		
Teaching aids	Materials & Tools	Basic concepts	Goals
<ul style="list-style-type: none"> <li>- Pictures of some of the artists' works that has the optical art designs like Bridget Riley</li> </ul>	<ul style="list-style-type: none"> <li>- Sketch</li> <li>- pencil</li> <li>- Ruler</li> <li>- Aristotle's Triangle</li> </ul>	<ul style="list-style-type: none"> <li>- Rhythm and unity</li> <li>- Line</li> <li>- color</li> </ul>	<ul style="list-style-type: none"> <li>- be a</li> <li>- Be able to analyze initial forms.</li> <li>- Be able to choose color</li> </ul>
Strategy used		Lesson Progress	
Brainstorming		<ul style="list-style-type: none"> <li>- At the beginning of the lecture, the researcher throws some interesting questions to motivate students to the topic of the current lesson through brainstorming.</li> <li>- Begin to choose the best designs from the whole students due to how they achieve the design rules and how they choosed the color due to applying the color theories</li> <li>- Students are divided into murals (from five to seven student in each mural) to start implementing the project</li> </ul>	
It occurs whenever the student issues a desired behavior, and the reinforcement will be material and moral			Strengthening

What difficulties did the student face while doing the lesson and how to overcome them	Correction
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#### Lesson Four

Subject	Finalizing the Design Project		
Domain	design		
Time	Lecture (6 hours) one day		
Age Group	second Year (18-20 Years)		
Teaching aids	Materials & Tools	Basic concepts	Goals
<ul style="list-style-type: none"> <li>- Pictures of some of the artists' works from op art school like Bridget Riley, Richard Anuszkiewicz, Marina Apollonio</li> </ul>	<ul style="list-style-type: none"> <li>- Sketch</li> <li>- pencil</li> <li>- brush</li> <li>- wall color</li> <li>- water proof painting</li> </ul>	<ul style="list-style-type: none"> <li>- Rhythm and unity, Balance</li> <li>- color</li> </ul>	<ul style="list-style-type: none"> <li>- to finish the Mural in acceptable and comfortable way</li> </ul>
Strategy used		Lesson Progress	
Brainstorming		<ul style="list-style-type: none"> <li>- At the beginning of the lecture, the researcher throws some interesting questions to motivate students to the topic of the current lesson through brainstorming.</li> <li>- Discuss what they did in the Murals, and help student how to finish the design murals</li> <li>- Paint the wall with the water proof to protect the murals</li> </ul>	
It occurs whenever the student issues a desired behavior, and the reinforcement will be material and moral			Strengthening
What difficulties did the student face while doing the lesson and how to overcome them			Correction

Teaching unit results Comment	
<b>Rhythm</b>	The students used Rhythm, Unity and balance by taking into account the distribution of the four design elements in the spaces they created through The Design Morals and the elements were distributed in the initial spaces taking into account the Rhythm and unity and balance in the distribution of each design element by analyzing the areas consistent with the context of the composition of each Design for students separately
<b>Line</b>	The students used the Line element in all their work, with the types of geometric lines and the organic line, while the straight geometric line and the organic line are the two most types that students used in their designs
<b>Shape</b>	The students used geometric and organic spaces, and also introduced organic shapes with geometric Grid in a harmonious manner, whether in the construction of design or within the treatment of areas.

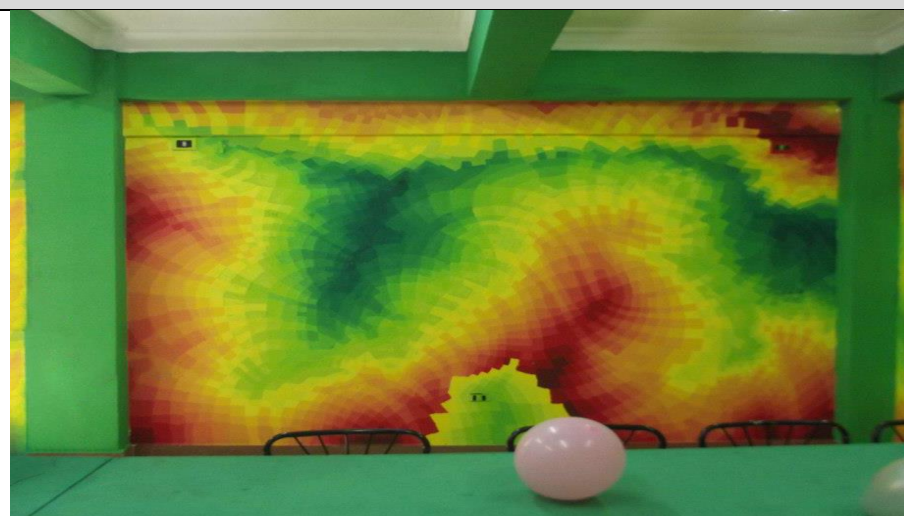
### Teaching unit results

Final Design Art – First Mural



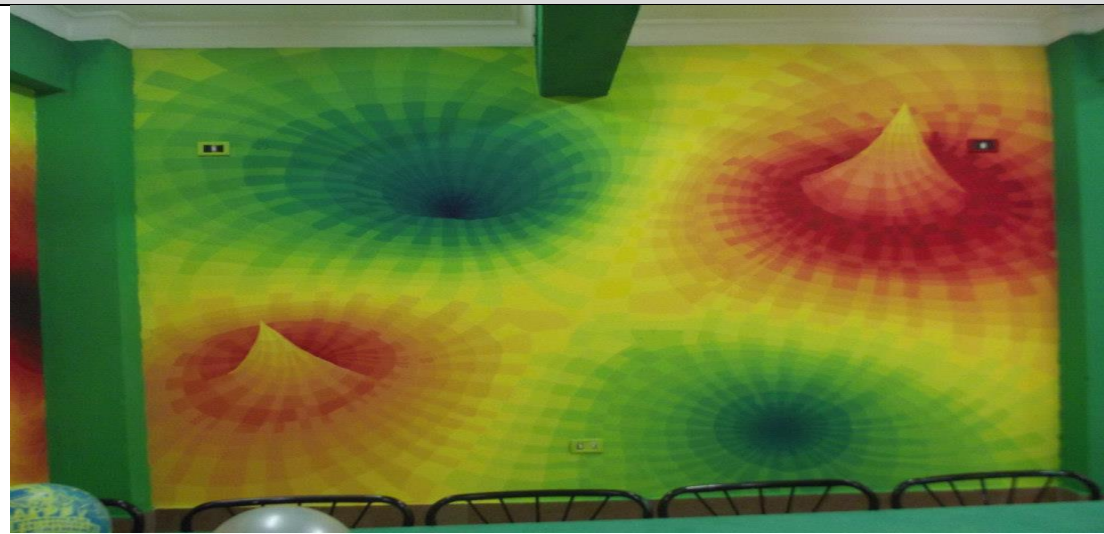
### Teaching unit results

Final Design Art – Second Mural



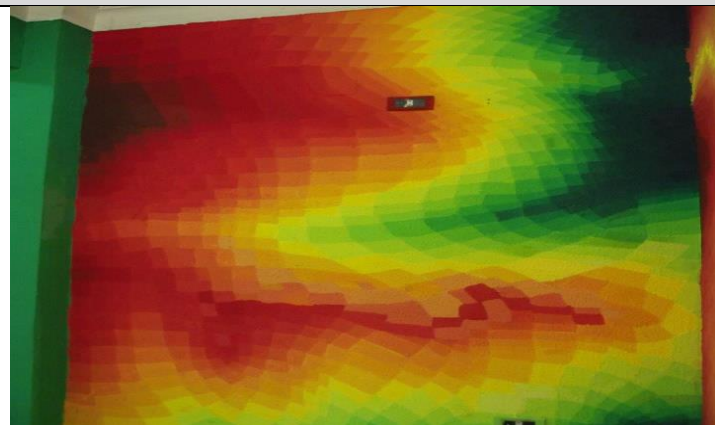
### Teaching unit results

Final Design Art – Third Mural



### Teaching unit results

Final Design Art – Fourth Mural



### Results:

The scale of<sup>1</sup> achieving the foundations of design in the mural works (prepared by the researcher) was applied to the murals of the current research and the number (4) murals by three arbitrators of experts<sup>(2)</sup> of the subspecialty and the steps of application were as follows:

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Scale1 (see appendices).

- 1- Each arbitrator applied the terms of the form to each of the (4) murals, and the role of the arbitrator is to answer with ( Ö ) if the design foundations are available, and the answer with (×) if the design foundations are not available.
- 2- Each arbitrator calculated the final results for each of the scale items for the 4 murals.
- 3- The researcher calculated the averages of the final results of the arbitrators' scores for each item of the scale as stated in the applications of the three arbitrators for each mural of the 4 murals, as well as the percentages.

**The final results were as shown in the following table:**

**Table (1) Percentages of Arbitrators' Estimates on the Availability of Design Foundations in Total Murals**

% Availability in total murals (4) in total murals	Design foundations	M
83%	Linear rhythm	1
92%	Rhythm chromatography	2
79%	Proportions and proportions	3
85%	Unit	4
86%	Balance	5

From the previous table, the researcher sees that the results of a consensus have confirmed the existence of an investigation of the foundations of design in the murals subject of the current research ranging from 79% to 92%, and this result is considered statistically acceptable, and indicates the achievement of the research objective and hypotheses.

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- (2) The application was carried out by (3) arbitrators of experts from the exact specialization of the researcher, professors and assistant professors from the Department of Art Education, Faculty of Specific Education - Ain Shams University.

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## Research Appendices

**Appendix (1):** Opening and honoring pictures at the Design Atelier at the Faculty of Specific Education, Ain Shams University.

**Appendix (2):** The final image of the questionnaire and the scale of judgment on the murals.

**Appendix (3):** Stages of calculating the percentage of the arbitrators' agreement on each of the design bases included in the scale.**Appendix (1)**

### Opening and honoring pictures

**The Design Atelier at the Faculty of Specific Education, Ain Shams University.**





## Appendix (2)

### The final image of the questionnaire and the scale of judging the murals

Prof. Dr.

#### Greetings.

Prof. Dr. Ahmed Mustafa Mohamed Abdel Aziz, Assistant Professor of Design, Department of Art Education, Faculty of Specific Education – Ain Shams University with research entitled: Design and implementation of murals for the Art Education Department Atelier at the Faculty of Specific Education at Ain Shams University: Achieving design principles with second-year secondary school students

The research requires the establishment of a scale to judge the availability of five foundations of the design to achieve the objectives of the research, and the role of the arbitrator is to answer b (Ö) if the design foundations are available, and the answer is (×) if the design foundations are not available, and the following is the form of the scale (the final form after modification).

Availability		Design Name	M
×	Ö		
		Linear rhythm	1
		Rhythm chromatography	2
		Proportion and proportionality	3
		Unit	4



		Balance.	5
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- Please review the items of the scale and express an opinion on their appropriateness in light of the objectives of the current research.

**Thank you**

**Researcher**

### Appendix (3)

#### Stages of calculating the percentage of arbitrators' agreement on each

##### One of the design foundations included in the scale

**The first stage:** Each arbitrator shall judge the availability or non-availability of the five design bases in a number (4) mural representing the results of the current research through the following model:

Total property availability in the (4) mural	Mural numbers and judging the availability of design foundations							Design foundations
	To the end of the 4 murals	3		2		1		
		No	Yes	No	Yes	No	Yes	
								1- Linear rhythm
								2- Chromatic rhythm
								3- Proportion and proportionality
								4- Unit
								5- Equilibrium

**The second stage:** reaching the percentages of the arbitrators' agreement on the availability of each of the design foundations through the following model, which aims to reach the percentage of the arbitrators' agreement for one of the design foundations, and repeats the use of this model to reach the percentages for each of the five design foundations on the scale.

% Arbitrat ors Agree ment	Aver age Arbit rator s Agree ment	Total num ber ( ) Öper arbit rator	The availability or unavailability of the basis number ( ) of the design foundations is ( )					Arbitrators
			To the end of the murals	Mural (2)		Mural (1)		
				×	Ö	×	Ö	
								First Arbitrator
								Second

								<b>Arbitrator</b>
								<b>Third Arbitrator</b>

**From the previous model can get:**

- 1- The total number ( $\ddot{O}$ ) of each arbitrator on each design basis.
- 2- Finding the average agreement of the arbitrators on the availability of each basis of the design by dividing the average agreement of the arbitrators by the number of arbitrators (3 arbitrators).
- 3- Finding the percentage of the arbitrators' agreement on the availability of each of the design foundations by dividing the average agreement of the arbitrators by the number of murals, which is 4 murals, and then the quotient is multiplied  $\times 100$  to avoid fractures.

The percentages were then rounded to avoid fractions as well.