

Amazigh art as an inspiration source for contemporary interior murals made of glass and fabrics

Prof. Rasha Mohamed Ali Hassan Zenhoum

Professor – (glass department) – Helwan University

rashazenhom@gmail.com

Assist. Prof. Dr. Heba Mohamed Okasha Abou ElKamal Elsayegh

Assistant professor (Textile printing, dyeing & finishing) department- Benha University

heba.okasha2008@gmail.com

Abstract:

The original Amazigh art is the art of indigenous people of North Africa, especially Morocco. Amazigh is also part of the population of Tunisia, Morocco, Algeria, Mauritania, northern Mali, northern Niger and a small part of western Egypt represented in (Siwa Oasis).

The Amazigh art is characterized by its originality, richness, and the ability to express ethnic identity through its forms, signs, and writing, which are found in textiles and jewelry. The Amazigh women are considered to be the most conservative, notary, and implementers of this type of art. It is therefore a source of renewed inspiration for the contemporary artist who can deal with it in new ways and with different and contemporary visions in the interior architecture murals.

Keywords:

The Amazigh art, Interior murals, Contemporary murals, Interdisciplinary studies, Glass murals, fabrics murals & printed fabrics murals.

Statement of the problem:

- How to use the two materials (fabrics and glass), which are completely different in Characteristics, then merge them to create contemporary design murals inspired from (Amazigh art)? In which the aesthetic and creative forms is achieved by mixing these two different materials in (nature, Characteristics, application and implementation) to create the contemporary interior murals.

Aims & Objectives of the research:

- To benefit from the integration of the two materials (glass and fabrics) to make contemporary interior murals created and inspired by the (Amazigh) art.
- Development of the innovation process and enrich it, through upgrading of Interdisciplinary studies between the different fields.

Importance of the research (Significance):

- Creating contemporary interior murals inspired by the (Amazigh) art, combining the two materials (glass and fabrics) in an innovative style.
- Trying application, and implementation of the two materials (glass and fabrics) to create contemporary murals and distinctive artistic designs, in which the optimum utilization of the

nature of the two materials to achieve excellence for the implemented works, whose results cannot be reached if only one of them is used.

The research hypothesis:

- The research assumes using combination of the two materials (glass and fabrics) can create contemporary interior murals with different characteristics and innovative style.
- The research assumes that using the (Amazigh) art as an inspiration source can achieve high creativity in contemporary interior murals.
- The research assumes that implementation of interior murals by mixing and blending two different materials, like (glass and fabrics) in contemporary interior murals, can achieve excellency for the implemented works, whose creative and artistic results cannot be reached if only one material of them is used.

The research limitations:

- **Spatial limits:** Amazigh art in North Africa (Morocco, Tunisia, Algeria, Mauritania, Siwa...) as it is the area that the study is concerned with - Using fabrics and glass as two mixed materials, in creating contemporary interior murals, inspired from (Amazigh art).
- **Time limits:** Traditional (Amazigh art) in North Africa (Morocco, Tunisia, Algeria, Mauritania, Siwa...).

The research methodology:

- It follows **the analytical and the applied research methodology** through the following points:
- The analysis of (Amazigh art) in (elements, forms, and signs) to get inspired by, in creating contemporary interior murals.
- **The applied methodology:** By using and implementing fabrics and glass in the contemporary interior murals.

The research Terminologies:

- **Imazighen (Berber):** Berber, self-name Amazigh, plural Imazighen, Sometimes called "Mazices" and free people. All of these terms refer to any of the descendants of the pre-Arab inhabitants of North Africa. (11).
- **Amazigh art:** The art which has been created by the Imazighen people in many places they have been settled, especially in North Africa.
- **Interior murals:** It is very large image, inside the building which applied directly to a wall or ceiling, such as painting, enlarged photograph attached largely to the wall. (14).
- **Interdisciplinary studies:** The word "interdisciplinary" is defined as simply "involving two or more academic, scientific, or artistic disciplines, also incorporates several fields of study to allow collaboration among diverse disciplines to either specify or broaden students' education, to gain understanding, and/or to problem solve. (12) (13).
- **Digital textile printing:** Digital textile printing is considered to be the 'next generation' printing which is quite different from conventional fabric printing. With fabric printing going digital (16).

- **Glass fusing:** It is one of the glass technique, that can be described as the process by which different forms and colors of glass are bonded through heat in a kiln. In practical terms, however, glass fusion represents a technological revolution in modern art studios. (15)

Introduction:

The word (Amazigh) means (free people) or perhaps (free and nobleman) according to some references in the original (Amazigh) language, which distinguishes them from strangers (who have foreign origins), they are the indigenous people of North Africa, west of the Nile Valley specifically. And the most advanced name although it is not correct for the Berbers is (Berber), a term that the Berbers reject to a large extent because of its negative connotation because it is related to the word (barbaric) (2) (3) and the term barbaric has roots that belong to the Greek civilization, which considered any human being outside its civilized range is barbaric and savage, up to modern European colonialism, which in its language has found no evidence for the people of Morocco other than the word “Bérbère”. Which was preserved for its use after the Arabization of the ruling regimes and its rejection by the Berbers or the indigenous people of the country - as previously mentioned - (3). And that the Amazigh art is the art of the indigenous people of this region and it is original, distinctive, and very unique art, which makes it a rich and renewed source of inspiration for designers starting from the ancient arts in North Africa, where the art was inherited and nourished in this region and up to the alphabet (The Tamazight letters) whose shape is distinguished by the artistic richness and the ability to exploit its uniqueness in distinct design work through its use in making interior murals made of glass and fabrics.

Theoretical Framework

Who are the (Imazighen) Berbers

The distribution of Berber Amazigh states extends from the Atlantic Ocean to Siwa Oasis in Egypt, and from the Mediterranean Sea to the Niger River in West Africa. It is known historically that the Berber countries have spoken the Berber language, which is one of the branches of the Afro-Asian language family. The historical opinions have multiplied and differed among themselves in determining the origins of the Berber people and the difficulty of arbitration and inclination to view at the expense of the other, given the lack of historical evidence that are built on practical foundations which indicates a tendency to the validity of one of these views clearly at the expense of the other opinion. The Semitic Origin in this regard, Ibn Khaldun mentioned that the Berbers are descendants of Maza'i bin Kanaan bin Hamm bin Noah, meaning that the origins of the Berbers are Canaanite East. Another opinion held that the Berbers (Berbers) are of the Hami origin, i.e. of the sons of Ham ibn Noah, and in this regard, the scholar Muhammad Al-Shatibi Al-Andalus, in his book “Al-Joman in the brief of Akhbar Al-Zaman”, stated that biologists said that “the sons of Ham fought with Bani Sam, the sons of Ham were defeated, who went out to Morocco and procreated in it.” There is also a third opinion attributed to the dual origin of the Berbers (Berbers), and here it was mentioned that they are a mixture of the Semitic and Indo-European dynasties, "The first lineage is Indo-European, Such as the difference in the color of hair, eyes, and accents. There is a fourth opinion completely

rejected by the Imazighen in general and the Moroccans in particular because it stated that the Imazighen are from Yemen. (4)



Figure (1) shows the old Maghreb map, 1889

(17)



Figure (2) shows the symbol of the Amazigh peoples



Figure (3) shows the areas in which Arabs, Berbers, and mixed peoples reside

The Amazigh Language

The writing of the Berbers is called (Tifinagh) in the sense of (our writing, or invention), and had reached this writing in a manuscript, through a group of inscriptions, rocks, and tombstones thousands of years ago, and had more than a thousand engravings on the stone plates, and even exceeded 1300 texts (10). Also, the unknown Amazigh origins find the same problem is occurring in the origins of this alphabet (the language), so the researcher explains in the Amazigh culture that it is difficult to clarify a clear and known origin and a linguistic family of the Amazigh language similar to other languages such as Hebrew and Arabic, but as a language it has an existing and confirmed foundation. According to reports of the Royal Institute of Amazigh Culture, the Amazigh who speak it are more than 66 million people around the world, it has become an academic language recognized around the world and is taught as a course of study in those countries (5). And some opinions of researchers see in this regard that the Tifinagh alphabet of the Amazigh is one of the oldest in the world. (10)

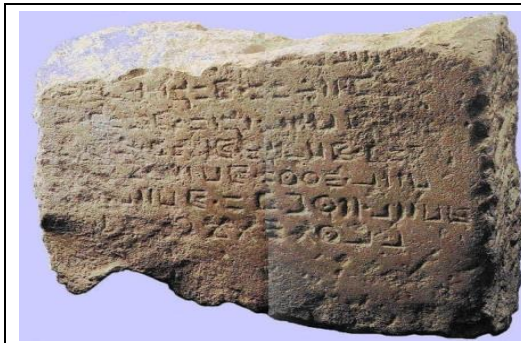


Figure (4) shows an Amazigh inscription (Tifinagh) in a museum in Europe



Figure (5) shows an Amazigh inscription (Tifinagh) in Amazigh manuscript for centuries before Christ.



Figure (6) shows some forms of houses and modern Amazigh architecture (9)

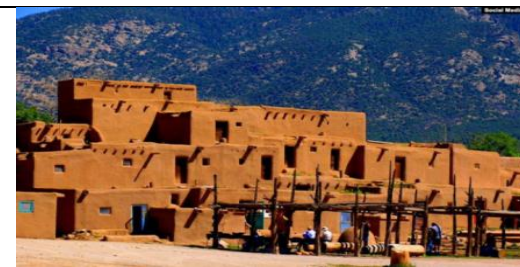
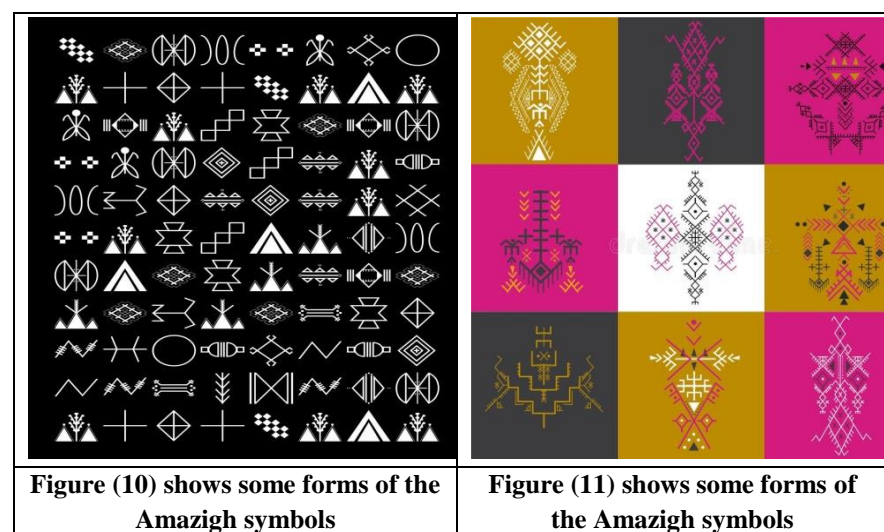
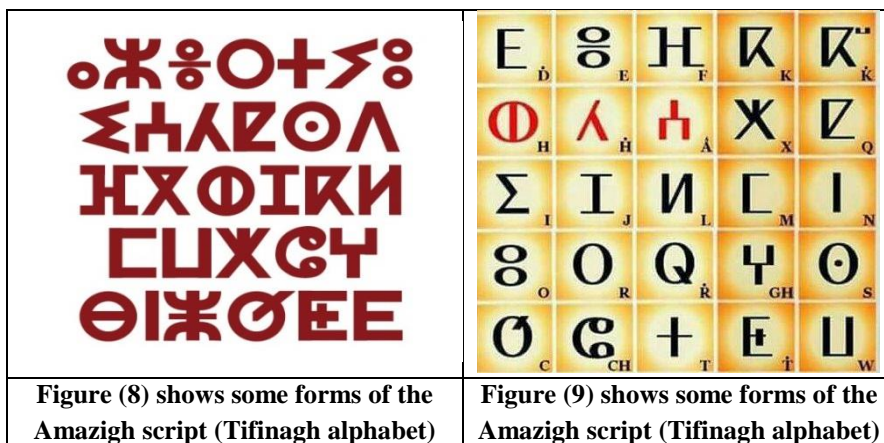


Figure (7) shows some forms of houses and modern Amazigh architecture

The alphabet and letters (Tifinagh) are consisting of (34) letters, they were used to write on rocks, caves, tombstones, western jewelry, body tattoos, and coins ... They are divided into two classes and they are the old varieties: we mention them especially the desert Tifinagh script and the eastern Libyan. However, the previous pattern is the one that appeared that was carried by this one who bears it. As for the eastern and western Libyan script, they are now confined to plastic arts such as carpets and carving on wood. Modern varieties: branding of varieties, generated and developed on the Tuareg language while preserving the letters (5). This art is one of the ancient global visual arts, which has been famous for centuries and has combined drawing and writing to give in the end an expressive face in which the alphabet is formed to give a harmonious painting that expresses a meaning, vision or message, and this art is one of the most beautiful and most difficult types of art, because of its accuracy and beauty in trying to draw letters or designing words, as well as creativity in forming letters and decorating them in unfamiliar geometric shapes. Finally, some artists and calligraphers try to use these letters in creating calligraphy art paintings and use all design methods, modern techniques, and hand drawing as well.

The advantage of the Amazigh script (Tifinagh alphabet) is that it is one of the most geometric alphabetical shapes, so you find its entire letters are reducible to a square divided by its diagonals into equal squares and divide it by three small circles into two halves. The geometric shape that distinguishes it from other alphabetical systems is also its ability to write from left to right and vice versa from right to left and from bottom to top and also from top to bottom, although the standard formula is to be written from left to right. (7)



The use of Amazigh motifs in applied arts:

A follower of the arts movement in North Africa, especially the Amazigh arts, is very keen that the Amazigh arts are like many traditional arts that have been revived again and reformulated in a modern and innovative style in many applied arts such as clothes, jewelry, furniture and pottery, and were admired by celebrities and they have used it ... Among the manifestations of applied arts in Amazigh art is the sewing of carpets, which was known to the Imazighen, and is considered one of the manifestations of their inherited civilization, and was decorated with plastic precision based on the fundamentals of plastic art such as (repetition, symmetry, rotation, congruence, contrast, and parallel), and the use of geometric shapes such as rectangles, rhombuses, circle, square and triangles, with a variety of thread colors with the use of horizontal, vertical, oblique, closed and open lines.

In its folds it had the Tifinagh letters; it means that the brightly colored Amazigh carpet, is very useful in heating and sheltering from the harsh climatic changes in summer and winter. Among the manifestations of plastic art in the countryside, the design of Berber is costumes in an exciting and attractive way, characterized by serenity, and peace. Tifinagh letters also constitute an artistic beauty and calligraphy and a wonderful plastic space with the lines of these letters and their cultural and civilizational significances.

Amazigh jewelry is a rare design because it represents one of the tributaries of the authenticity and historical depth of the "Amazigh" in the Moroccan heritage, and for this, it is

based mainly on the moral evaluation, that is, the formal and formative value of the connotations and symbols it carries in color and shape. Jewelry for Amazigh women symbolizes tribal affiliation, we find it mostly in silver in the countryside and gold in cities, but unlike jewelry among the Arabs, where the bracelets seem to have come from ancient museums. The arts of engraving and decoration depending on the various characteristics of formation that are based on hammering, stretching, melting, and casting into prepared molds.

Amazigh art has been known for its metallic elegance which combines tenderness and simplicity in support of a sense of refined taste that expresses a complex flavor of nobility and elegance so that it cannot be considered mere folklore or adornment. They are tales, myths, and beliefs that brew in memory and ignite shapes and symbols. Circular shapes mean sanctity because women are associated with shapes such as the sun and the moon, while the crescent and star are two Islamic symbols that indicate optimism (6) (18) (19). Also decorations of palm fronds were found, which are a symbol of production, abundance, prosperity, and fertility. The palm tree is the tree of life that symbolizes flowing water in popular memory even among Arabs. That is, each symbol used in all kinds of applied arts has a clear connotation and symbolism.

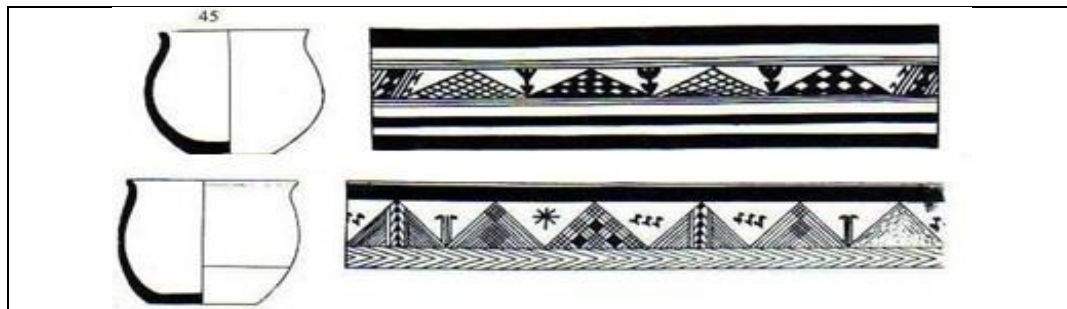


Figure (12) shows some illustrating Berber vessels and pottery from Constantine, Algeria.



Figure (13) shows Some forms of writing and Amazigh graphics in making modern bags that keep pace with international fashion trends.

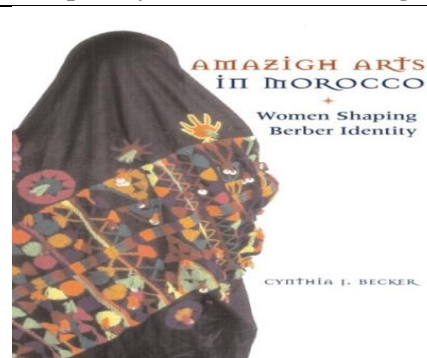
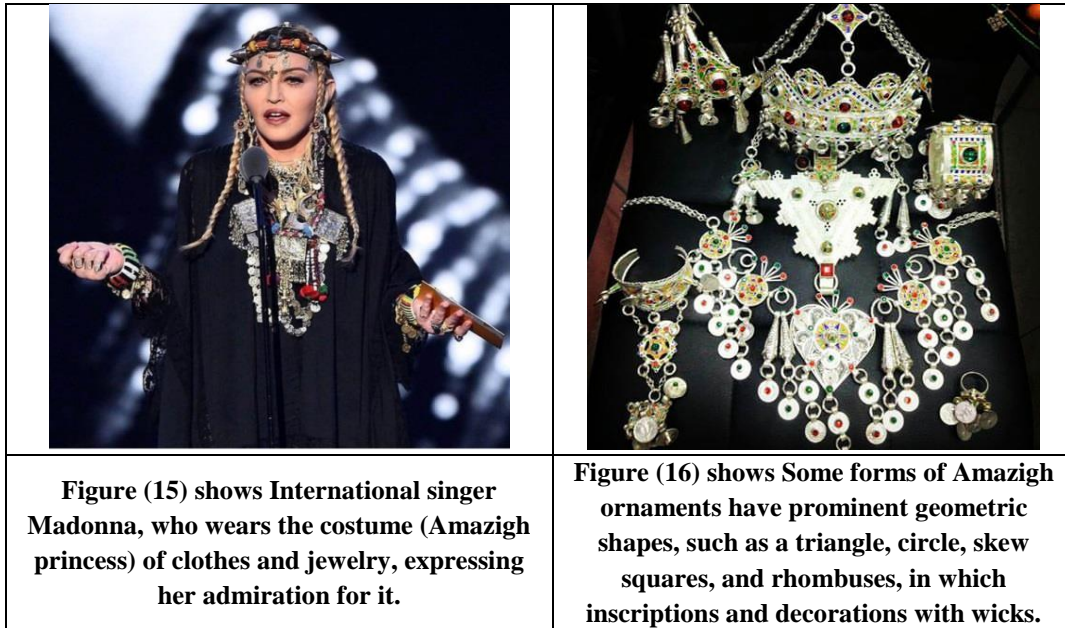


Figure (14) shows The use of some forms of Amazigh art in the embroidery and design of clothes.



The symbolism of colors in the Amazighs

There are many connotations and symbols of the colors in the Amazigh arts, which reflect many meanings, features, and symbolism that characterize the Amazigh art, you find the green color a symbol of youth, start and a good life, while the blue color is a symbol of calm and peace, while the red color symbolizes warmth, love, courage, and strength (the same reference is part of jewelry). As well as the white color that spread strongly after the introduction of Islam, as the color that was preferred by Berbers throughout their history is blue. But the Amazighs, with the introduction of Islam, will compensate it with the white color, an indication of the representation of the religion of Islam and the drive behind the principles of purity and the embrace of the Amazighs. As a reflection of these feelings, the psychological expression of colored gemstones is also carried out through these feelings.

What is a mural?

The mural is an artistic work that is being executed directly on walls, it has wide area most probably and isn't limited with frames and doesn't need mediums for its execution on the walls, but they are implemented on the walls directly even if it occupies only part of it, or even if the wall isn't even due to the presence of prominent or sunken parts such as columns, cambers or any other various architectural slots, even if the implementation was on multiple surfaces such as using facades and sides of a building in the implementation of one mural. **The paper research focuses only on the interior murals.**

Purposes of mural:

- 1- Developing the community regarding social and health aspects.
- 2- Linking political, social, and economic structures with the artistic structure.
- 3- Enhancement of realization and reviving the civil environment and economic development.
- 4- How to restore the social sensation and limit racial tension and stabilizing the societal concept towards contemporary causes?

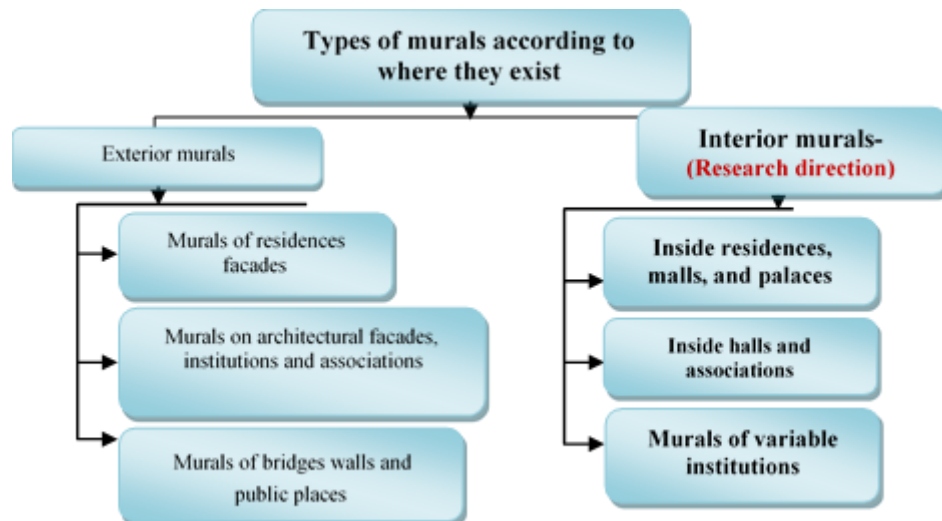


Fig (17) clarify types of murals

Some of the conditions and considerations that should be taken care of during execution of an interior mural:

- Consideration of ratios and compatibility between size of the mural and the place where it will be executed in the interior design.
- Study visual elements and their relation to the place ratio and the spot of its appearance from above or below level of sight.
- Connecting the used material with the place, from its quality or colors that should match colors of the place elements.

Various glass techniques that can be used when merging with fabrics:

Using means of thermal glass reformation whether individual or by merging in producing some glass patterns that fit to be merged with woven materials (different kinds of fabrics), or non-woven (leather and fur) to create styles of glass and other variable materials to produce and execute interior murals that serve all kinds of architecture and inspired from the Amazigh art. Means of thermal glass restoration can be divided into several levels according to temperature and glass viscosity. **Some of which are:**

- Inert thermal Level
- bending sagging level
- Glass formation with flame “flames”
- Millefiori technique (1)
- Technique (Pâte de Verre)
- Digital Printing technique on glass









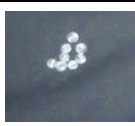

Digital printing textile technology:

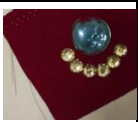









The digital printing process in general is intended to apply some colorants to fabrics according to a specific design shape or specific patterns, and sometimes it is according to a clear and specific repetition. For example, textile printing is related to its dyeing, as dyeing means the complete coloring of the fabrics while printing means coloring only in certain places. There are many methods of printing on fabrics, between the latest one which is digital printing or with thermal drafts, printing and dyeing knots, batik, stencils and dyes, and in rotary factories and

sometimes thermal transfer. Digital printing is one of the most important printing methods nowadays. It can be implemented in many Media like textile, glass, wood, aluminum (8) (16)etc.

Integration of fabrics and glass in one design (the mural):

An experimental study which include constant and variable was done on a collection of various fabrics such as (satin, wool, lycra, chiffon, gabardine, etc.) with the use of multiple kinds of implementing variable experiments like sewing, and the use of many kinds of glass adhesive materials such as (epoxy, silicone, wax, etc.) The adhesive substance like silicone **or** epoxy **or** wax.... as constant and try it with all the kinds of fabrics and shapes of glass like (Flat glass-Bunched crystal beads- stone lobes.....) and try it for all kinds of adhesive materials). Many experiments which include constant and variable as mentioned above, so the final result was as the following:

N o:	Type of glass	Results of the experie nce	Epoxy	Silicone	Sewing experiments	Wax	Multiple purposes adhesive UHU
1.	Flat glass	The image					
		The result	Fits	Doesn't fit	Doesn't fit	Doesn't fit	Doesn't fit
		The reason	It was used on the crepe fabric and it was noticed that it leaves a slightly dry trace.	It was used on the chiffon fabric and it leaves a dry trace on the fabric and because of its extreme porosity, the adhesive material leaks out.	It is hard to fix the glass piece in addition to the bad aesthetic look due to the appearance of strings.	It was used on the satin fabric but it was noticed it doesn't adhere due to the weight of glass over the fabric.	It was used on gabardine fabric and it was noticed that it is hard to deal with.
2	Bunch ed crystal beads	The image					
		The result	Fits	Fits	Fits	Fits	Fits
		The reason	Ease of installation but it leaves a trace on the fabric.	Ease of installation.	Ease of installation.	Ease of installation.	Ease of installation.

3	Stones (lobes)	The image					
		The result	Fits	Doesn't fit	Doesn't fit	Doesn't fit	Doesn't fit
		The reason	Fits the weight of the lobe and doesn't cause damage to the textile.	It leaves a trace on the fabric.	The smooth rounded surface of the lobe hardens the process of fixing the string.	The heavy weight of the lobe makes it easy to take it off while adhering it.	Pieces can be easily ripped off after drying the adhesive.
4.	Millefiori	The image					
		The result	Fits	Doesn't fit	Doesn't fit	Doesn't fit	Doesn't fit
		The reason	It leaves a simple effect that can be avoided if carefully apply the adhesive material.	The silicon leaves a trace on the fabric and turns into rubber, it causes the lobe to strip off easily.	It is hard to fix the glass pieces and the small size of the beads obstructs the sewing process, in addition to the bad aesthetic look due to the appearance of strings.	After being dried out, it is easy to take off the glass pieces.	After being dried out, it is easy to take off the glass pieces.

The following tables clarify the experimented types of fabrics and the best adhesives that could be used to integrate glass with the fabrics:

Using adhesive substance epoxy:

Glass type/fabric type	Millefiori	Dichroic	Stones	Transparent Glass Spectrum	Transparent Egyptian Glass	Opaque	Mosaic
Crepe	•	•	•	•	•	•	•
Tarja	•	•	•	•	•	•	•
Linen							
Leno							
Wool	•	•	•	•	•	•	•
Organza							
Semi-natural chiffon							
Chiffon							
Tulle							
Chiffon satin							
Lycra							
Shiny satin							
Shiny chiffon							
Viscose							
Satin							
Jersey							
Stretch linen	•	•	•	•	•	•	•
Heavy crepe	•	•	•	•	•	•	•
Lace							

Using wax as adhesive substance:

Glass type/fabric type	Millefiori	Dichroic	Stones	Transparent Glass Spectrum	Transparent Egyptian Glass	Opaque	Mosaic
Crepe	•	•	•			•	•
Tarja	•	•	•			•	•
Linen	•	•	•			•	•
Leno	•	•	•			•	•
Wool	•	•	•	•	•	•	•
Organza	•	•	•			•	•
Semi-natural chiffon	•	•	•			•	•
Chiffon	•	•	•			•	•
Tulle	•	•	•			•	•
Chiffon satin	•	•	•			•	•
Lycra	•	•	•			•	•
Shiny satin	•	•	•			•	•
Shiny chiffon	•	•	•			•	•
Viscose	•	•	•			•	•
Satin	•	•	•			•	•
Jersey	•	•	•			•	•
Stretch linen	•	•	•			•	•
Heavy crepe	•	•	•	•	•	•	•
Lace	•	•	•			•	•

Using adhesive substance UHU:

Glass type/fabric type	Millefiori	Dichroic	Stones	Transparent Glass Spectrum	Transparent Egyptian Glass	Opaque	Mosaic
Crepe	•	•	•	•	•	•	•
Tarja	•	•	•	•	•	•	•
Linen	•	•	•	•	•	•	•
Leno	•	•	•	•	•	•	•
Wool	•	•	•	•	•	•	•
Organza							
Semi-natural chiffon							
Chiffon							
Tulle							
Chiffon satin							
Lycra	•	•	•	•	•	•	•
Shiny satin							
Shiny chiffon							
Viscose	•	•	•	•	•	•	•
Satin							
Jersey	•	•	•	•	•	•	•
Stretch linen	•	•	•	•	•	•	•
Heavy crepe	•	•	•	•	•	•	•
Lace							

After all these experiments by using many kind of adhesives substances in various kinds of fabrics, the best result is epoxy **adhesive** substance because of the following points:

- Epoxy adhesive substance hardens quickly.
- The glass is opaque, so it does not show any yellowing effect on the fabrics.
- It makes quick fixation of the glass.
- It is suitable as adhesive substance for heavy beads glass, make strong fixation in fabrics.


Applied Studies:

The applied study of the research is based on the combination of using two materials, glass and fabrics, in the design of murals and interior hangings that are used as a basic and main part of architecture in the interior design, and the murals have been designed to fit multiple places,


from administrative offices and ballrooms.... And therefore, the sizes and designs for this have varied to suit the environment and the place where the employment is. And since murals, in general, can be classified internal or external according to where they are used, they can also be classified with the love of their themes, roles, and function that they perform.

These details and uses of these interior murals will be clarified by analyzing the methodological steps for designing each mural and clarifying its usage environment.

The first design idea

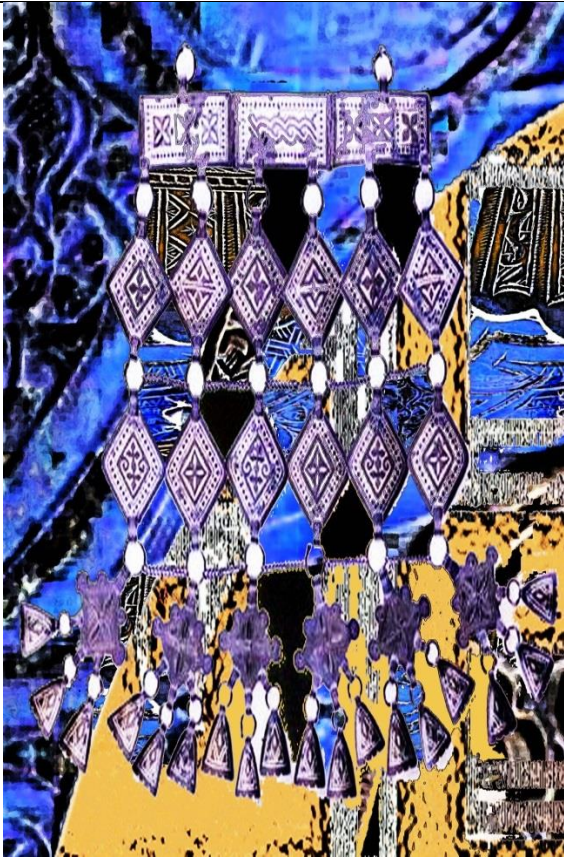
Kind of mural & the suggested place	Mural named (Abak Elsahra) – Inner mural inside halls or entrance of commercial Malls.
Suggested Interior mural design	
Design inspiration source	Inspired by the heritage of Amazigh art, the distinctive alphabet, and the daily life of the Amazigh woman while she wanders in the desert and her rotating daily life with many scenes.
Interior mural dimension	"4" height and "30" meters width.
Suggested materials used in the implementation of the mural	The use of digitally printed fabrics to illustrate the whole scene and design, especially clothes of the Amazigh woman in its bright colors and combine them with different types of glass with different techniques such as glass sculpture. Glass sheet. Reshaping of glass, using glass lobes to inlay fabrics, making surfaces of glass mosaic and adding a waterfall to express purity and transparency.

The Second design idea

Kind of mural & the suggested place	Mural named "Tin Henan", which is an internal mural inside a heritage hall or the main heritage library.
Suggested Interior mural design	

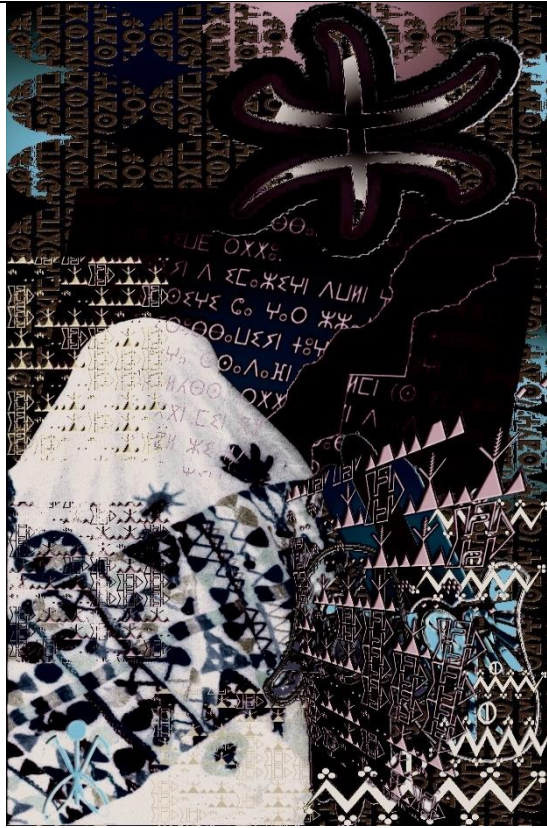
Design inspiration source	An interior mural is inspired by the history of the Amazigh and expresses an important representation of an important part in the Amazigh history, as it represents the image of "Tin Henan" that a 4th-century Tuareg queen. She was a strong, brave, and spiritual mother of the Tuaregs. She was defending her land and people against other invaders and enemies. The mural also contains an expression of the Amazigh alphabet, motifs, and kinds of Amazigh architecture.
Mural dimension	3.5" height and "1.5" meters width."
Suggested materials used in the implementation of the mural	The use of digital printing fabrics to illustrate the whole scene of the design with the whole details, especially the clothes of the Tuareg queen "Tin Henan" in its bright colors and how to combine them with different types of glass with different techniques such as glass sculpture, reshaping of glass, using glass lobes to inlay fabrics, making surfaces of glass mosaic and adding a 3D dimensions to the mural.

The Third design idea

Kind of mural & the suggested place	Mural named "Treasure", which is an internal mural inside a heritage identity hotel
Suggested Interior mural design	

Design inspiration source	An interior modern mural is inspired by one of the most important treasures in the Amazigh art and expresses an important inspiration source, which is the uniqueness of Amazigh jewelry, fine details of Amazigh motifs, and geometrics.
Mural dimension	"2" height and "1.5" meters width.
The suggested materials used in the implementation of the mural	The use of different types of digitally printed fabrics to illustrate the details of the Amazigh jewelry details in its bright colors and combine them with different types of glass with different techniques such as glass sculpture, reshaping of glass, using glass lobes to inlay fabrics, making surfaces of glass mosaic and Glass fusing to express purity, transparency and the 3 dimensions.


The Fourth design idea

Kind of mural & the suggested place	Internal Mural named "The Leader", which is a mural inside the lobby of hotel and malls.
Suggested Interior mural design	
Design inspiration source	An interior mural is inspired by the history of the Amazigh and expresses an important representation of an important part in the Amazigh history, as it represents the role of the Imazighen women that united the Amazigh tribes, lead them in the seventh century AD, and established their kingdom. The mural also contains an expression of the Amazigh motifs, symbols, clothes, and architecture.



Mural dimension	"2" height and (4.5) meters width.
	In this mural, we use digitally printed fabrics to illustrate the whole design & view of the Amazigh woman in different colors and combine them with different types of glass with different techniques such as glass sculpture, (Glass fusing) and reshaping of glass, using glass lobes to inlay fabrics, to express details, mixing the materials. And transparency.

Samples of Implemented interior mural designs:


- Internal implemented Mural (1)

Applied & Implemented Techniques	<p>Mural named "Tin Henan", is an internal mural that is implemented by using mixing between:</p> <ul style="list-style-type: none"> -Textile digital printing in heavy natural cotton fabric (Duck) and using (Glass fusing) technique to implement some parts of the design (Tifinagh) letters, then joining together pieces of glass at high temperature, usually in a kiln. This is usually done roughly between 700 °C (1,292 °F) and 820 °C (1,510 °F), and can range from tack fusing at lower temperatures, in which separate pieces of glass stick together but still retain their shapes, to full fusing at higher ones, in which separate pieces' merge smoothly into one another. <p>Implementation by mixing between digital printing fabrics and glass fusing technique adding strong aesthetic effect, levels in interior mural, 3D shapes in some parts with real texture & handling and interactive effect can't be achieved by printed fabrics only or glass techniques only.</p> <ul style="list-style-type: none"> - Epoxy is used as adhesive substance between fabric and glass, according the result of previous experiments.
Parts of implemented interior mural	

- **Internal implemented Mural (2)**

<p>Applied & Implemented Techniques</p>	<p>Mural named "The Leader", it is an internal mural which is implemented by using mixing between:</p> <ul style="list-style-type: none"> - Textile digital printing in heavy natural cotton fabric (Duck) and also the researches are using the Glass fusing technique in some parts of design like (small beads & (Tifinagh) in the background of the design. Glass fusing can be implemented by joining together pieces of glass at high temperature, usually in a kiln. This is usually done roughly between 700 °C (1,292 °F) and 820 °C (1,510 °F), and can range from tack fusing at lower temperatures, in which separate pieces of glass stick together but still retain their shapes, to full fusing at higher ones, in which separate pieces merge smoothly into one another. Implementation by mixing between digital printing fabrics and glass fusing technique adding strong aesthetic effect, levels in interior mural, 3D shapes in some parts with real texture & handling and interactive effect can't be achieved by printed fabrics only or glass techniques only. - Epoxy is used as adhesive substance between fabric and glass, according to the result of previous experiments.
<p>Parts of implemented interior mural</p>	
	

- **Internal implemented Mural (3)**

<p>Applied & Implemented Techniques</p>	<p>Mural named "Tifinagh ", it is an internal mural which is implemented by applying paint in glass sheet with special coatings according to the suggested design idea. We leave it to dry and draw up the design idea, then the color is removed according to the design using engraving and abrasive tools to make the glass clear again, then complete the firing process up to (590) C. The digital printing fabric is placed between two layers of glass so that the first layer of glass is being painted over it, showing the transparency of the glass in the color of the used printing textile, so we can show the printed textile design details through the engraving painting glass. That way, we can mix between the natures of the two materials in different way from the previous implemented interior murals, to make new mural creative design with different implementation techniques according the idea of the design and the target aesthetic effect.</p>
<p>Parts of implemented interior mural</p>	

Conclusion:

The study is concerned with one of the most important Interdisciplinary studies in the field of applied arts, which are (textile & glass) although the two materials are very different in nature and properties from each other

The research study is based on the combination of using the two materials, glass and fabrics, in the design of interiors murals, the researchers take the Amazigh art as an inspiration source for designing these interior murals. The interior murals have been designed to fit multiple interior places in malls, libraries..... and therefore, the research make a lot of experiments on many kinds of fabrics to clarify the experimented different types of fabrics and the best adhesives that could be used and be more suitable to integrate glass with the fabrics, also an experimental study was done on a collection of various fabrics such as satin, wool, lycra, chiffon, gabardine, duck etc. with the use of multiple kinds of glass, implementing variable experiments with sewing and the use of adhesive materials such as epoxy, silicone, wax. At the end and after all these previous experiments, the researchers have designed four interior murals

inspired by (Amazigh art) as the essential source for the research and implemented parts of them by using digital printing on heavy Duck fabrics and using (Glass fusing) in some parts of the designed murals, like letters with different shape, colors, textures and sizes to make all the murals 3 Dimensional.

So, when we use important inspiration source like (Amazigh art) to get inspired with as designers, and also use two different kinds of materials that are completely different in (properties, nature, Characteristics, application, and implementation (Fabrics and glass), we can make interior murals with high creativity and innovation that can't be achieved with glass only or with fabrics only.

Results:

- Interdisciplinary research study allows for the synthesis of ideas and the synthesis of characteristics from many disciplines, like fabrics and glass.
- Using two completely different kinds of materials, can increase innovation creativity, and making new ideas out of the box like the interior mural, which is implemented by using digital printing textiles and many techniques of glass like Glass fusing.....
- Researching old and traditional inspiration sources, like (Amazigh art), can improve the creativity and inspiration process with new ideas, motifs, and colors and patterns to get inspired with.

Recommendations

- The necessity to increase the Interdisciplinary studies between many fields of applied arts; it should solve lots of problems in more than one field with innovative way.
- The Egyptian governmental & private universities should have an integration of specialists, researchersto create Interdisciplinary studies in undergraduate and postgraduate studies.
-

References:

- Books:

1- Crofford- Maurice - The Rich Cut Glass of Charles Guernsey Tuthill- Texas A&M University Press-2001.

- Websites:

2-Nuunja Kahina, free people: The Imazighen of north Africa , accessed (1-2-2021) <https://intercontinentalcry.org/free-people-the-imazighen-of-north-africa/>

3- "About earth-cultures ", "Earth culture inspiring genius experiences: The Berber people", accessed (15-1-2021), <https://www.earth-cultures.com/destinations/morocco/berber-of-morocco->

4- About "MAGHREBVOICES", "Aswat maghreba", Accessed (1-10-2020). <https://www.maghrebvoices.com/>

5- Hamdawy, Gameel, "madekhal ela kataba elamazighia", Accessed (1-10-2020), http://www.amazighworld.org/arabic/studies/index_show.php?id=1311

- 6- Hamdawy, Gameel, "Elharka eltashkilia elamazighaia bialrief", Accessed (9-4-2021), <https://pulpit.alwatanvoice.com/content/print/147590.html>.
- 7- "About PORTIAL-AMAZIGH", "kesam elthakafa elamazighia", accessed (7-4-2021), <http://www.portail-amazigh.com/search/label/%D9%82%D8%B3%D9%85%20%D8%A7%D9%84%D8%AB%D9%82%D8%A7%D9%81%D8%A9%20%D8%A7%D9%84%D8%A7%D9%85%D8%A7%D8%B2%D9%8A%D8%BA%D9%8A%D8%A9?&max-results=10>
- 8-Terlizzi, Mike, "Understanding the Basics of digital textile printers", Accessed (7-4-2021), <https://itnh.com/blog/basics-digital-textile-printers/>
- 9- Putinja, Isabel, "Exploring the Berber towns and culture of Tunisia", Accessed (7-3-2021), <https://www.lonelyplanet.com/articles/exploring-the-berber-towns-and-culture-of-tunisia>
- 10-"About PORTIAL-AMAZIGH", "kesam elhadara elamazighia", Accessed (7-4-2021), <http://www.portail-amazigh.com/search/label/%D9%82%D8%B3%D9%85%20%D8%AD%D8%B6%D8%A7%D8%B1%D8%A9%20%D8%A3%D9%85%D8%A7%D8%B2%D9%8A%D8%BA%D9%8A%D8%A9?&max-results=10>
- 11-Brett, Michael, "Berber People", Accessed (7-4-2021), <https://www.britannica.com/topic/Berber>
- 12- "About CBUONLINE", Interdisciplinary studies: a connected learning approach, Accessed (21-3-2020), <https://www.cbuonline.edu/articles/what-is-interdisciplinary-studies>.
- 13-Accessed (21-3-2020), <http://press.rebus.community/idsconnect/chapter/basic-terms>
14. "About COLLINS DICTIONARY", "Definition of 'mural'", Accessed (21-3-2020), <https://www.collinsdictionary.com/dictionary/english/mural>
15. "About BULLSEY GLASS", METHOD & IDEA, Accessed (21-3-2020), <http://www.bullseyeglass.com/education/fusing-basics.html?fbclid=IwAR0gcfutygI6dupMRQQNgn3FwBo423w98t3i-9pifpra4o4AP-xvrdVR9WU>
16. "About FIBRE2FASHION", Digital textile printing, Accessed (21-3-2020), <https://www.fibre2fashion.com/industry-article/7055/digital-textile-printing>
17. Bratu, Mihaela, "Terms of Reference in the Berber History", Tradition and Art in Maghreb, Accessed (10-3-2021), https://www.researchgate.net/publication/334482507_Terms_of_Reference_in_the_Berber_History_Tradition_and_Art_in_Maghreb.
18. -"About AFRICA", "AMAZIGH (BERBER)", Accessed (10-4-2021), <https://africa.uima.uiowa.edu/peoples/show/Amazigh+%28Berber%29>.
- 19-"About TRIBALISTE", "Patterns and signs in berber crafts", accessed (5-4-2021) <https://www.tribaliste.com/magazine/en/patterns-and-signs-in-berber-crafts/>
- 20- "About THEFREEDICTIONARY", "Mural", accessed (1-5-2021), <https://www.thefreedictionary.com/mural>.
- 21- Benyoussef, Iman, "a project that tries to keep Amazigh symbols alive", accessed (1-5-2021), https://issuu.com/imanebenyoussef/docs/amazigh_issu