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THE UTILITARIAN AND AESTHETIC VALUES OF THE CERAMIC FORM USED TO EMPHASIZE LIGHT THROUGH ACCOMPANYING PIERCINGS

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Abstract

A significant relationship exists between the ceramic shape and the light emitted through its gaps with various decorations from which the bright light shines, which helps to highlight the utilitarian or aesthetic value of the shape. This study is summarized as follows:

- This practical experiment of 27 students for the ceramic hollows project the success of these practical results, which reflect the actual utilitarian and aesthetic value of the ceramic shape. The students learned new applied skills in how to make these decorative units and learned how to carve piercings, using them to emphasize the light.
- The utilitarian value achieves a certain benefit or advantage. Aesthetic value makes an object desirable and beautiful in the eyes of others. The aesthetics of ceramic art and the pierced decorative units to emphasize the light achieve combines the utilitarian and aesthetic value of the artwork.
- The use of natural or artificial lighting between the gaps of the ceramic shape has a clear effect on the ceramic work and its highlighting and aesthetics.
- The experience of lighting through ceramic piercings is an art that reflects a wonderful marriage between ceramics and lighting. The piercings and cavities in the ceramic piece are exploited to create magical lighting effects. When light is directed at these piercings, complex and beautiful light patterns are generated that give the ceramic piece a new life and additional dimensions.
- The students' results show the possibility of creating special and multiple topics related to the art of piercing, as the Islamic decorative pattern, Kuwaiti heritage, the plant environment, and contemporary engineering designs for illuminated piercings during ceramic work were presented.
- The higher the percentage of piercings in the ceramic work, the higher that of illumination in the ceramic form, and the lower that of piercings, the lower the percentage of illumination in the ceramic work of the project. Therefore, the greater the amount of illuminated piercings, the greater the aesthetic and utilitarian value in the ceramic form.
- The piercings and cavities in the ceramic piece play a fundamental role in this experiment. These piercings also act as channels for light, allowing it to pass and disperse within the piece, creating diverse light patterns.
- The natural or artificial lights can be placed inside or behind the ceramic piece.
- The shadows, light, and colors that appear when light passes through the piercings form overlapping shadows and colors on the outer surface of the piece, creating an attractive visual effect.
- Lighting is an essential element in the world of ceramics, as it is not limited to providing a clear vision for the artist while working, but goes beyond that to greatly affect the result of the artwork.

In conclusion, the experience of lighting through ceramic piercings is a wide field for creativity and innovation. It combines art and technology to create unique and amazing visual experiences.

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1. INTRODUCTION

Ceramic forms correlate to the light passing between the gaps of ornaments, radiating with natural or artificial lighting.

Ceramic art has progressively evolved through the ages to sophisticated levels of mastery and aesthetic beauty. Potters have employed various techniques to bring about this sophistication, including piercing ceramic forms to both accentuate light and produce dazzling lighting.

The utilitarian value of piercing ceramics to project light is manifested in multiple aspects; ceramic piercings can be a source of direct and indirect light, thereby producing a warm and cozy atmosphere indoors. Pierced ceramics can substitute traditional lamps, thus reducing costs and saving energy. In addition, the piercings provide design versatility, as their diverse shapes and sizes can be used as decorative and illuminating elements in a variety of spaces. The utilitarian value lies also in the thermal insulation properties of ceramic piercings, which make them ideal in colder regions.

Aesthetically, using ceramic piercings for optimized light has numerous facets, among which is visual beauty. Pierced ceramics produce stunning light effects that contrast between shadow and light, hence giving spaces a special splendor.

Designing pierced ceramics is the potter’s artistic expression conveying thoughts and emotions, which creates unique artworks. They blend aesthetically with diverse décor styles, adding an artistic touch to any space. Furthermore, light boosts mental health, whereby pierced ceramics provide a relaxing and tranquil setting.

The artistic expression of pierced ceramics combines decorative elements of utilitarian and aesthetic value. They bring natural light and warmth, as well as save energy, and add an artistic touch to any given space. In addition, not only do they express the creativity of the potter yet also play an essential part in the overall ambiance of the space.

2. RESEARCH PROBLEM

Islamic artists used cavity formations and piercings to emphasize the value of the light emanating from the ceramic vessel. Therefore, students use the same technique to create new forms.

3. OBJECTIVES

The research aims to:

1. Illustrate the utilitarian value of the ceramics through cavities
2. Train students in the cavity forms
3. Reveal the effect of light on the ceramic form

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4. SIGNIFICANCE OF THE RESEARCH

The significance of the study is summarized as follows:

1. Demonstrating the utilitarian and aesthetic value of the ceramic form using lighting
2. Identifying the aesthetic and utilitarian value of the ceramic form by students in practice
3. Instructing students to establish a correlation between ceramic forms and lighting via motifs and piercings

5. RESEARCH TERMINOLOGY

5.1 Utilitarian value:

Utilitarian value refers to an essential concept in numerous disciplines, spanning from philosophy and ethics to economics and the social sciences. Broadly speaking, utilitarian value denotes the value of an object or action based on its ability to bring about a particular benefit or utility. Its dimensions involve self-interest, which refers to the benefit an individual directly derives from something. Social utility denotes the benefit provided to society. Economic utility is quantified commonly by the financial benefits obtained from a given object. Art itself—as well as its utilitarian value—extends beyond aesthetics to embrace cultural, social, psychological, economic, and educational dimensions ([1]).

According to Marshall (1980), utilitarian value refers to the fulfillment of human needs through consuming products or services. It is intended to maximize utility from limited resources. Utilitarian value denotes the amount of benefit or satisfaction that an individual derives from the consumption of a good or service. This notion is linked to the theory of utility in economics, which addresses analyzing consumer behavior and decision-making in response to the desire to maximize the utility of available resources ([2]).

Dewey (1980) argues that utilitarian value through the visual and artistic sciences is a medium of cultural communication and serves as a mechanism for articulating social values, documenting historical events, or relaying cultural messages. This sort of utilitarian value renders art as a device for fostering collective identity ([3]).

For Throsby (2001), the utilitarian value of art comprises its contribution to the economy via the creative industry, including cinema, music, design, and architecture. These arenas represent major sources of income and employment ([4]).

Elliot Eisner (2002) further suggests that the utilitarian value of art serves as an educational tool for imparting knowledge and skills and promoting critical thinking. For instance, paintings depicting social or political issues can spur societal dialogue ([5]). It illustrates how art can deepen people's insight and contribute to the growth of their skills. A generic example of utilitarian value is products, industrial resources, and auxiliary materials that optimize human life and services that aid humans in the environment and their needs, which are endowed with positive outcomes and can improve their lives.

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5.2 Aesthetic value

Al-Dahri (2005) describes aesthetic value as the quality that elevates an object to the level of desirability and beauty in the human perception. It represents the quality that arouses in us feelings of admiration, enjoyment and contentment, excites the senses, and prompts us to appreciate and contemplate. Aesthetic value means the value of an object in the sense of the beauty of its form, its idea, or its expression of deep significance. The dimensions of aesthetic value involve sensory beauty, which concerns the beauty that we see, hear, smell, or touch. For instance, the appeal of a painting and the fragrance of a flower are key components of aesthetic value. Mental beauty refers to the intellectually perceived beauty of ideas, meanings, and thoughts, such as the beauty of a poem or novel. Another dimension of aesthetic value is spiritual beauty, which deals with the beauty linked to our values and beliefs, such as the beauty of nature ([6]).

Factors that affect aesthetic value include:

- Personal preferences: Everyone has different preferences, and hence, aesthetic values vary widely from person to person.
- Cultural background and environment: The culture and environment in which we are raised affect the formation of our aesthetic tastes.
- History: Aesthetic values evolve throughout time and are affected by artistic and intellectual advancements.

Aesthetic value is exemplified in the arts (Paintings, sculpture, literature, etc.), nature (landscapes, animals, plants, etc.), and design (buildings, furniture, clothing, etc.) ([7]).

The significance of aesthetic value lies in the spiritual enrichment that it brings to our spiritual and emotional life. It is essential for communicating with others and expressing oneself. It is also important for creativity, as aesthetic values encourage creativity and innovation ([8]). Aesthetic value forms an intrinsic aspect of our lives and mirrors our desire for beauty, harmony, and wholeness.

John Dewey (1934) suggests that aesthetic value relies on the individual's subjective experience, as it is a sentiment elicited by the perception of beauty in artwork or landscapes. It is rated upon personal impressions and the sentiments that it raises ([9]). He argues that the aesthetic experience is based on the direct interaction between the individual and the artwork, where beauty is seen as a process rather than a fixed property.

For Emmanuel (1790), aesthetic value is tied to the harmony and symmetry of artistic elements, be it colors, shapes, or composition. These qualities are fundamental to capturing attention and providing a sense of satisfaction ([10]). He characterizes beauty as a sense of harmony that comes from the realization of an object without any practical purpose. Monroe Beardsley (1981) considers art, which exhibits high aesthetic value, to have a visceral appeal to the human mind and emotions, such as eliciting admiration or deep contemplation ([11]). He maintains that aesthetic value is gauged by a work's ability to elicit a distinct mental and emotional response.

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Aesthetic value revolves around the sensory and emotional response to artwork or nature and is associated with elements of harmony, beauty, and emotional impact. This value depends on culture and personal experiences.

According to Arthur Danto (1981), aesthetic value often echoes the cultural and aesthetic values of a particular society, becoming a metric for the development of artistic taste and cultural identity ([12]). He discusses how aesthetic values convert ordinary works to art with cultural meanings.

5.3 Cavities

Cavity is a general term that describes any piercing, hole, or cavity found within a solid object or material. Cavities can be natural, such as rock cavities, or artificial, such as cavities carved into wood or metal. In other terms, a cavity is essentially an empty space surrounded by solid material. The types of cavities differ depending on the materials and purposes. Examples of cavities include natural ones, such as cave cavities and volcanic rock cavities. There are also industrial ones, such as cavities in machine parts and molds, and the ones in construction, such as wall cavities and decorative ornaments. In arts, there are cavities made of ceramics, wood, and sculpture ([13]). Cavities have significance in many fields, including biological functions—cavities in the body are crucial for many biological functions. In art, cavities are used to add depth and detail to artworks.

5.4 Light and lighting

Light is a form of electromagnetic energy that is visible to the human eye. It is the basis of our sense of sight, allowing us to see things around us. The wavelength of visible light ranges from 400 to 700 nanometers. In simple terms, light enables us to see ([14]). Horace Kahn (2023) views lighting as the process of providing light to a space. This lighting may be either natural, such as sunlight, or artificial, such as light from lamps. The purpose of lighting is to create a sufficient level of illumination that allows for clear and safe visibility and to bring about a certain ambiance in a space. In other terms, lighting involves the use of light to illuminate places ([15]).

The difference between light and lighting:

- Light: The energy itself that produces the sensation of seeing.
- Lighting: The process of applying this energy to light a specific place.

The sources of light and lighting are drawn from natural sources, such as the sun, stars, and lightning. Others are from artificial light sources, such as incandescent and fluorescent bulbs, LEDs, and candles.

- Examples of lighting: room, street, and theater.

The importance of light and lighting is essential for the act of seeing and, therefore, for performing many daily activities. It also makes us feel safe and avoid accidents. Lighting improves our moods and emotions. It is also aesthetically pleasing and plays an important role in interior and exterior design.

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6. RESEARCH LIMITS

The scientific research will focus on the following:

1. Applied to the Department of Art Education students in the ceramics course (2)
2. The utilization of piercing techniques in the ceramic form
3. Using the appropriate white clay to produce pierced shapes in the ceramic form

7. SCIENTIFIC RESEARCH METHODOLOGY

The research applies the descriptive-experimental approach to 27 female art education students in the ceramics course (2).

- Chapter I: Theoretical material: Lighting and its relationship to the ceramic form
- Chapter II: Applied material and practical experience with the students
- Chapter III: Findings

The research themes will be discussed as follows:

7.1 First theme: The importance of lighting and its relationship to the ceramic form

I: Significance of Lighting in Ceramic Work

Smith (2016) and Al-Dawari (2003) argue that lighting is an essential component in the field of ceramics, as it not only allows the artist to see clearly while working but also greatly influences the resultant piece. The importance of lighting in ceramic work is as follows:

- Highlighting color and texture: Lighting is vital in accentuating colors and fine details of ceramic vessels. Light highlights the natural colors of clay and additives and exposes the smooth or rough texture of the surface.
- Setting the mood: Lighting can establish a certain atmosphere around a ceramic piece. Warm light provides the work with a sense of warmth and comfort, while cool light adds a calm and cozy atmosphere.
- Emotional reaction: Lighting can elicit different emotions in the viewer, like happiness, sadness, calmness, or excitement.
- Manipulation of shadows: The shadows generated by lighting give depth and suspense to the ceramic piece and can highlight details of shape and size.
- Influencing perception: Lighting can modify the shape of a ceramic piece in the viewer's perception by altering the angle of incidence and the intensity of the light. It also affects and enhances the effect of soft light to prevent harsh shadows that may obscure some details.
- Simplifying the molding process: Sufficient lighting provides artists with a clear vision of the piece while molding, allowing them to master their craft.

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- Enhance fine details: Directed lighting can illuminate the fine details in the motifs and patterns on a ceramic piece ([16]).

II: Types of Lighting Used in Ceramics

Martin Wan (2023) argues that lighting types are as follows:

- Natural lighting: The sun is a source of natural lighting, offering warm and natural light, yet with variable intensity and direction.
- Artificial lighting: This comprises incandescent, fluorescent, and LED bulbs, which provide constant and controllable light in intensity and color ([17]).

III: Guidelines for Proper Lighting for Ceramic Work

It is preferred to consider the appropriate lighting for ceramic work, according to Douglas (2018) and Wan (2023) as follows:

- Concentrating on the colors by picking a lighting that emphasizes the desired colors to highlight the ceramic work
- Ensuring adequate lighting to include all facets of the ceramic piece and underline its motifs
- Choosing diffused lighting to avoid hard shadows that hide details
- Experimenting with various kinds of lighting and angles to reach the optimal ones

Briefly, lighting is a key ingredient in ceramic work beautification and its appeal to the viewer. By selecting the proper lighting, a ceramic artist can emphasize the beauty of their work and create a unique visual experience ([18]).

IV: Factors Affecting the Relationship of Lighting to the Ceramic Form

Lighting is crucial for accentuating the beauty and fine details of ceramic forms and affects the global impression of the ceramic artwork by the observer. Brown (2019) and Wan (2023) consider the factors influencing the relationship between lighting and the ceramic form as follows:

- Type of light: Natural or artificial, white or colored, direct or indirect
- Angle of light: The angle at which the light is projected onto the ceramic piece
- Light intensity: The amount of light that shines on the piece
- The colors of the ceramic piece
- The texture of the ceramic piece: surface roughness or smoothness
- The shape of the ceramic piece: its size, geometry, and details ([19])

Lighting is a valuable tool to the ceramic artist and can be harnessed to further elevate the beauty of their work and its impact on the viewer. Understanding the relationship

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between light and ceramic form allows the ceramic artist to produce unique and impactful visual experiences.

7.2 Second Theme: Applied Aspect: Practical Experience with Students

The applied aspect is highly relevant in the field of ceramics, whereby scientific facts can be concluded and reached in the field of ceramic sciences. According to Ghandour (2005) on the importance of applied studies, the more the study in the artistic heritage is combined with practical and scientific experimentation, the more rewarding and educational it will be—as concentrating on the theoretical study does not fulfill the required in technical colleges in particular as it requires scientific practice and experimentation with materials and techniques. He further recommends the scholar examine the arts of heritage thoroughly, without limiting oneself to boundaries, but rather delving into the origins and distant roots, which are a heritage that holds relevant contents, cultures, and ideas that are closely linked to the present ([20]).

The practical aspect can be categorized based on the following applied stages:

7.2.1 Designs of Students' Ceramic Projects

Pierced Ceramic projects are a rewarding experience that combine creativity, technique, and cultural heritage. Students can explore their artistic abilities and develop appropriate designs craft skills while expressing their artistic vision through the projects.

All students of the ceramics course (2) endeavor to creatively develop a ceramic work that contains pierced geometric or circular decorations or drawings with cavities. These designs are determined after several sketches and modifications until one is finally selected to initiate the experiment.

7.2.2 Practical Steps of the experiment

I: The Molding and Building Stage of Ceramics

The molding and building stage are the core process of ceramics, in which a mass of clay is transformed into a three-dimensional art form. In this phase, students creatively aestheticize and convert the clay into a unique artwork. The design is determined, the appropriate idea is selected, and a practical plan is set to carry out the ceramic construction of each project. The students consider the building techniques and what tools are helpful in the process of building the ceramic form and utilizing the method of forming the ceramics.

The ceramic molding and building stage comprise the following steps:

1. **Clay preparation:** For the clay to be ready to start working, it must be plastic and moldable; the clay is produced by adding water, storing it, and then kneading it if it is not ready.
2. **Manual slab construction technique stage:** The technique of slab construction is a proper method for making a decorative piercing ceramic project. This method relies on

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building strips of clay, utilizing pottery clay, placing it between the two wooden targets, and rolling it out using a mixer or a round roller to produce individual strips of clay. These are used to form the appropriate shapes of the desired design by molding and glazing the parts together with ordinary ceramic tools. Each student begins to assemble the parts of the ceramic work to form their design.

3. **Glazing and assembling the segments:** Art education students begin to build and assemble parts of the basic shape of the artwork, taking care to fit the parts and joints firmly and well together, utilizing the soldering process. The soldering process involves fitting the parts of the slides, using a ceramic needle tool, and then applying liquid clay to the composite parts and affixing them; they ensure the soldering process by passing a rope clay over the composite joints and then leveling and blending it on the surface of the ceramic work. The soldering stage is crucial for the construction and balance of the shape and to ensure that the ceramic piece does not fracture or crumble.
4. **Drying stage:** Upon completion of the proper construction phase of the ceramic work, the piece is progressively dried to decrease the water content and harden while retaining a small percentage of water inside the clay. The wall of the ceramic clay is monitored with the sense of touch and knowing its softness, dryness, or abundance of water. If the ceramic work is excessively loose, it is air-dried and left in place for a prolonged period and occasionally monitored without the use of plastic sheeting to cover the ceramic work. This stage is vital to ensure consistency and dryness and to prepare the ceramic piece for the decorative piercing stage. The piercings and cavities of the ceramic work cannot be made without this stage.
5. **General Finishing Stage:** Upon completion of the construction process, a finish should be applied to the artwork to improve the appearance of the three-dimensional piece. The method of finishing is conducted by applying blocks of clay to weak or cracked places or in areas where fractures or crookedness of the surface are present. Alternatively, a little water with a sponge is used to correct the imperfect edges and parts and to improve the external appearance of the form before starting the decorative Piercing stage of the form.

II: The Stage of Decorating and Piercing the Ceramic Clay

The stage of decorative painting and piercing the ceramic clay is the process that provides the ceramic piece with its unique spirit and beauty. During this phase, the three-dimensional shape becomes an artwork that reflects the idea and design of the students and shows their creativity in the piercings and cavities. This stage is significant as follows:

- Beautification of the piece: Decorations and colors bring beauty and diversity to the ceramic piece.
- Self-expression: The decorations mirror the personality and artistic style of art education students.
- Adding artistic value: Decorations enhance the artistic and aesthetic value of the piece.

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Among the essential phases of the decorating and piercing stage:

1. Surface preparation:

- Drying: It is imperative to double-check the dryness of the area where drawing or decorative piercings is to be executed. The surface must be dry to start drawing.
- Smoothing: Students employ specific tools to smooth the surface appropriately and to remove any roughness with sponges or metal polishing tools.

2. Ornament design:

- Sketching: Each student's work is performed by drawing the pre-determined decorative design on the corresponding position on the ceramic surface. The proper layout, size, and space of the area of the ceramic work is established and examined to perform any required modifications.
- Spontaneity: The decoration may be spontaneous, with students adding new details as they draw.
- They can add geometric, botanical, biblical, or just abstract lines and shapes to illustrate appropriate piercings.

III: Piercing Ceramics

Piercing a ceramic piece is a fine art that brings depth and detail to the design and makes for dramatic light and visual effects. There are various methods to accomplish it, and the ideal approach is based on the size and depth of the cavity desired. Here are some essential steps for making decorative piercings and cavities:

1. Sketching:
    - Designing the piercings: Students start by tracing the piercings and decorative drawings—as per individual designs—accurately on the surface of the piece. They draw a pencil or sharp object to make marks.
    - Determining the depth: The depth of the piece is defined by its thickness.
2. Piercing:

There are two types of piercings:

- Deep: These create large cavities and add depth to the design.
- Staggered: Several layers of piercings are applied to create a three-dimensional effect.
    - Piercing tools: These are used according to the size and depth of each student's desired cavity.
    - Starting on the outside: Students begin by piercing the outer edges of the cavity and then move toward the inside using the cutter and continue.

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- Controlling the pressure: Note that hard pressure should not be applied to avoid breaking the piece.
- Gradual depth: If a student desires a cavity with a gradual increase in depth, start with smaller piercing tools and then proceed to larger tools.
- Using water: Water is applied to moisten the clay lightly during piercing, which facilitates the removal process.
- Practicing piercing on tiny clay pieces prior to working on the final piece as piercing takes precision and patience.

3. Finishing and tidying up the piece once finished:
   - Remove the excess: Use a sponge or a damp cloth to remove extra clay blocks
   - Smoothing: Students smooth the edges of the cavity using precise piercing tools.

IV: Kiln Firing

After shaping and decorating the ceramic piece, the next decisive stage is the kiln firing process. This turns the moist clay into a solid and durable ceramic piece.

The firing procedure hardens the piece, and the high heat inside the kiln ensures that the clay particles stick to each other indefinitely, thereby rendering the piece strong and durable. It also sets the decorations in place. The heat affixes the motifs on the piece, rendering them resistant to breakage. It also alters the clay's physical and chemical properties throughout the firing process, granting the ceramic piece new properties such as heat and water resistance.

The electric kiln is most commonly used in this experiment and is distinguished by its accurate temperature control and ease of use.

Stages of the first firing process (bisque firing):

- The raw (unglazed) piece is heated at a temperature between 900–1,200° Celsius.
- It will extract the residual moisture in the clay and stabilize it.
- The piece becomes strong but porous following this process.

Chapter III: Findings from the students' practical applications

The outcomes of the experimental study revealed the vast potential of the cavity and piercing techniques in producing unique and fascinating light experiences in ceramic forms. Combining art and light offers us the opportunity to investigate aesthetic aspects of lighting design and decorate the piercings. The experiment has demonstrated that piercings are not merely a form of decoration but a medium for interacting with light and creating an enchanting atmosphere. This practical demonstration highlighted the student's diverse designs, and they all applied the hollows and cavities on the ceramic work in an expressive way, although the designs differed depending on their choice with the nature of the chosen theme.

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Throughout the implementation process, some students encountered certain challenges in the construction stages and occasionally in choosing the appropriate shapes and types of decorative elements, as well as the method of cutting and piercing.

The art education students succeeded both in practice and theory. These results are similar in the overall theme chosen in order to achieve lighting and utilitarian and aesthetic values; however, they varied in the method of implementation, their forms, and the manner of designing their hollows, and the results can be broken down into several topics according to the thematic approach chosen by the students as follows.

I: Pierced Ceramics bearing the Islamic and Arabic styles

The findings of the students' work in this study reveal a variety of forms of Islamic heritage through arches, domes, lighthouses, geometric motifs, and Arabic calligraphy in their ceramic designs. They have placed well piercings and cavities for the elements of Islamic decorations and units, piercing these units in a proper and balanced fashion for the spaces in the form from which the light emerges if exposed to natural lighting (see Figures 1 and 2). These outcomes provide a brilliant reflection among the internal piercings of the shape so that the aesthetics of the Islamic art of the ceramic piece emerge, while its shadows can be reflected on the wall or change the direction of the lighting in it.

II: Pierced ceramics inspired by Kuwaiti heritage and old Kuwaiti buildings

The findings of the students' works reveal a wide range of forms inspired by the design of the old Kuwaiti houses, castles, and the way Kuwaiti walls and fences are constructed. They created piercings and cavities for building elements such as windows while making the doors the main piercings from which the light passes when exposed to natural or artificial lighting (Figures 3 and 4). These findings provided a glowing reflection between the cavities showing the aesthetics of the ceramic piece's Kuwaiti heritage and controlling its shadows and the direction of the lighting or exposing the lighting from the outside to the artwork.

III: Pierced ceramics decorated with botanical motif

In this study, a variety of botanical motifs, such as plant leaves, flowers, curved branches, and palm fronds, were used. They have also successfully placed the piercings of the plant elements in a shape that shines when illuminated (Figure 5). These results allow a brilliant reflection in the piercings, displaying the aesthetics of the leaves or flowers, and their shadows can be reflected on the wall. The lighting direction can also be reversed from the outside to the inside.

IV: Pierced ceramics exhibiting the contemporary character of circular motifs and geometric triangles

The students' works reflect the diverse contemporary forms through the use of medium and small circular elements, as well as the use of the geometric motifs of the triangle in close proximity and sometimes spaced apart, and their spatial distribution in the ceramic work provided a wonderful impression in implementing the piercings on the ceramic form.

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They also made a brilliant selection in creating the hollows and cavities that illuminate when exposed to the light (Figures 6–8). Such results reflect luminous effects in the spaces to reveal the aesthetics of the contemporary art of geometric circles and triangles. The reflections on the wall can vary by changing the direction of the lighting.

Figure 1: The students' results of the pierced ceramics for emphasizing light. Their choice of the Islamic heritage character and the use of Islamic geometric motifs, decorative Arabic letters, windows, doors, domes and the Islamic lighthouse

Figure 2: The students' results of the pierced ceramics for emphasizing light (They opted for the Islamic heritage theme and the use of Islamic geometric motifs, windows, domes, and the Islamic minaret)

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Figure 3: The female students' results of the pierced ceramic for projecting light. The students' choice of the Kuwaiti heritage and Kuwaiti buildings

Figure 4: The female students' results on the pierced ceramics for highlighting light (The students opted to include character of Kuwaiti heritage and Kuwaiti buildings)

Figure 5: The students' results of the pierced ceramics for highlighting the light (They opted for the character of plant decorations and the shape of pierced plant leaves and flowers)

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Figure 6: The students' results of the pierced ceramics for bringing out the light (They opted for the contemporary nature of the geometric circular motifs)

Figure 7: Female students' results of the pierced ceramics for shedding light. The students' choice of the contemporary nature of the geometric triangle motifs

Figure 8: Female students' results of the pierced ceramics for lighting (They opted for of the contemporary nature of the geometric triangle motifs)

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8. RECOMMENDATIONS

Based on the applied practice of studying the utilitarian and aesthetic value of the ceramic form utilized to project light through the piercings, the researcher recommends the following:

- Academics, scholars and specialists should focus on ceramics with interest in the effect of lighting and light, whether emanating from the artwork or induced on it from the surrounding environment, hence impacting and changing its colors.
- The researcher suggests further research and development of pierced ceramics of the Arab heritage by experimenting with different applications of murals, wax lighting, and other methods to achieve aesthetic and utilitarian value.
- Moreover, studies should be conducted on the influence of the surrounding environment in emphasizing the beauty of the ceramic lighting, as wall and furniture colors can be used to enhance the visual appeal of the ceramic piece to accentuate the lighting.
- Creativity in pierced ceramics should be maximized, especially as they fit with the atmosphere of Arab architecture and withstand heat and weathering, thus increasing the aesthetic and utilitarian value.
- The researcher recommends the significance of mixing utilitarian and aesthetic value in art and using them together in most art forms in order to elevate the art itself. Art provides meaning to the human condition, affecting its environment, and, thus, cannot be dispensed with.
- Potters and anyone involved in lighting should maximize the piercings in the ceramic form. The number of the piercings correlates positively with the lighting in the ceramic works, which emphasize their aesthetic and utilitarian value.
- To avoid breaking the ceramic form during creating piercings and cavities in the clay, the researcher recommends starting from the upper side of the three-dimensional piece, moving on to the middle side, and then finishing the decoration on the bottom side.
- The researcher recommends applying a variety of natural and artificial colored lights, which can produce overlapping shadows and colors on the exterior of the piece, thus creating an attractive visual effect.

9. CONCLUSION

There is a major correlation between pierced ceramics with diverse decorations radiating luminous light and emphasizing their utilitarian or aesthetic value. This study is summarized as follows:

- The accumulated practical experience for 27 students of the ceramic discharge project illustrates the success of these practical results, which express the actual utilitarian

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and aesthetic value of the ceramic form. Students have learned new practical skills in working with these decorative units and have gained the knowledge of creating piercings and channeling light through them.

- Utilitarian value brings a particular benefit or utility. Aesthetic value refers to the qualities that appeal to others as desirable and beautiful. The aesthetics of ceramic art and the pierced decorative units to accentuate light combines the utilitarian and aesthetic value of the artwork.
- Using natural or artificial lighting through pierced ceramics has the most pronounced effect, emphasizing the artworks' aesthetics.
- Incorporating lighting into pierced ceramics forms a wonderful synergy. The piercings and cavities in a ceramic piece are utilized to produce enchanting light effects. When light is channeled into these piercings, complex and beautiful light patterns are created, bringing vibrancy and dimension to the ceramic piece.
- The students' results conclude that light piercings have multiple special themes manifested in the resultant ceramic work, including Islamic decorative pattern, Kuwaiti heritage, botanical environment, and contemporary geometric designs.
- The abundance of piercings in the ceramic work allows more light, and conversely, fewer piercings guarantee less light in ceramic work. Consequently, the greater the amount of illuminated piercings, the greater the aesthetic and utilitarian value of the ceramic form.
- The piercings and cavities in the ceramic piece are essential to this experiment. They act as light conduits, passing and scattering light within the piece, thereby creating a variety of light patterns.
- Various natural or artificial lights can be positioned inside or behind the ceramic piece.
- The overlapping shadows, light, and colors emerge around the piece when light passes through the piercings, producing a visually appealing effect.
- Lighting is a key aspect of ceramics; not only does it provide a clear view to the artist while working but it also greatly affects the resultant piece.

In conclusion, lighting in pierced ceramic is a vast field of creativity and innovation. It blends art and technology to produce unique and breathtaking visual experiences.

Footnotes

1) T. Payne and Son (1789). Introduction to the Principles of Morals and Legislation. London.; Smith, Adam. (1776). The Wealth of Nations. London; W. Strahan and T. Cadell. (1863). Utilitarianism. London: Parker, Son, and Bourn.
2) "Marshall, Alfred (1890). Principles of Economics. London: Macmillan."
3) Dewey, John. (1934). Art as Experience. New York: Minton, Balch & Company
4) Throsby, David. (2001). Economics and Culture. Cambridge: Cambridge University Press.

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DOI: 10.5281/zenodo.15373219

5) Eisner, Elliot W. (2002). The Arts and the Creation of Mind. New Haven: Yale University Press.

6) Al-Dahri, S. (2005). The Aesthetic Values in the Books of Reading for the First Three Grades in Iraq, Egypt, and Lebanon. Journal of the College of Education for Girls for Humanities, Al-Qadisiyah University.

7) Hegel, Georg Wilhelm Friedrich. (1990). “Aesthetics”. Arabic Book House: Croce, Benedetto. (2001) “Aesthetics”. Cambridge University Press. Arnold, Matthieu (1970) An Introduction to Literary Criticism. Oxford University Press

8) Habermas, Jürgen. (1984) The Theory of Communicative Action. Cambridge University Press. : Sen, I. “Modern Utilitarianism” (1970). Oxford University Press.

9) Dewey, John. (1934). Art as Experience.

10) Kant, Immanuel. (1790). Critique of Judgment.

11) Beardsley, Monroe C. (1981). Aesthetics: Problems in the Philosophy of Criticism.

12) Danto, Arthur C. (1981). The Transfiguration of the Commonplace: A Philosophy of Art.

13) Tarbuck, Edward J., Lutgens, Frederick K. (2019): Earth: An Introduction to Physical Geology,Pearson; Callister, William D. Jr. (2018) Materials Science and Engineering: An Introduction, Wiley.

14) International Lighting Vocabulary (1987). Number 17.4. CIE, 4th edition. ISBN 978-3-900734-07-7. By the International Lighting Vocabulary, the definition of light is: “Any radiation capable of causing a visual sensation directly.

15) Kan, Rayzeek (2023) what is Lighting: https://www.rayzeek.com/ar/glossary/%D9%85%D8%A7-%D9%87%D9%8A-%D8%A7%D9%84%D8%A5%D8%B6%D8%A7%D8%A1%D8%A9

16) Smith, Catherine (2016) Colors in the Visual Arts. Oxford University Press: Al Dawri, S. (2005). The Aesthetic Values in the Books of Reading for the First Three Grades in Iraq, Egypt, and Lebanon. Journal of the College of Education for Girls for Humanities, Al-Qadisiyah University.

17) Wan, Martin (2023) guide-to-museum-lighting: https://www.ledyilighting.com/ar/a-definitive-guide-to-museum-lighting/

18) Douglas, James. (2018) Fundamentals of Lighting in Art and Design. Modern Art Publishing, 2018.: Wan, Martin (2023) The definitive guide to museum lighting. https://www.ledyilighting.com/ar/a-definitive-guide-to-museum-lighting/

19) Brown, Ellen. (2019) The Art of Lighting in Art Display. Cultural Publishing House: Wan, Martin (2023) The definitive guide to museum lighting. https://www.ledyilighting.com/ar/a-definitive-guide-to-museum-lighting

20) Mohsen Muhammad Abdullatif Al-Ghandour (2005) Research title: Technical methods of Islamic ceramic paintings as an introduction to ceramic processing, p. 342, Journal of Research of the Faculty of Quality Education - Mansoura University, Issue Six - July 2005.

Arabic references

1) Arnold, Matthieu (1970) *An Introduction to Literary Criticism*. Oxford University Press

2) Brown, Ellen (2019) *The Art of Lighting in Art Display*. Cultural Publishing House:

3) Al-Dahri, S. (2005). The Aesthetic Values in the Books of Reading for the First Three Grades in Iraq, Egypt, and Lebanon. *Journal of the College of Education for Girls for Humanities*, Al-Qadisiyah University.

4) Douglas, James (2018) *Fundamentals of Lighting in Art and Design*. Modern Art Publishing.

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5) Smith, Catherine (2016) *Colors in the Visual Arts*. Oxford University Press.

6) Sen, I. “Modern Utilitarianism” (1970). Oxford University Press.

7) Croce, Benedetto. (2001) “Aesthetics”. Cambridge University Press.

8) Mohsen Muhammad Abdullatif Al-Ghandour (2005) Research title: Technical methods of Islamic ceramic paintings as an introduction to ceramic processing, p. 342, *Journal of Research of the Faculty of Quality Education* - Mansoura University, Issue Six - July 2005.

9) Habermas, Jürgen. (1984) *The Theory of Communicative Action*. Cambridge University Press.

10) Hegel, Georg Wilhelm Friedrich. (1990). “Aesthetics”. Arabic Book House.

References

1) Beardsley, Monroe C. (1981). *Aesthetics: Problems in the Philosophy of Criticism*.

2) Callister, William D. Jr. (2018) *Materials Science and Engineering: An Introduction*, Wiley.

3) Danto, Arthur C. (1981). *The Transfiguration of the Commonplace: A Philosophy of Art.*

4) Dewey, John (1934). *Art as Experience*. New York: Minton, Balch & Company

5) *Earth: An Introduction to Physical Geology*, Pearson (2019).

6) Eisner, Elliot W. (2002). *The Arts and the Creation of Mind*. New Haven: Yale University Press.

7) International Lighting Vocabulary (1987). Number 17.4. CIE, 4th edition. ISBN 978-3-900734-07-7. By the International Lighting Vocabulary, the definition of light is: “Any radiation capable of causing a visual sensation directly.”

8) Kan, Rayzeek (2023) what is Lighting: https://www.rayzeek.com/ar/glossary/%D9%85%D8%A7-%D9%87%D9%8A-%D8%A7%D9%84%D8%A5%D8%B6%D8%A7%D8%A1%D8%A9

9) (1790). Critique of Judgment.

10) Marshall, Alfred (1890). *Principles of Economics*. London: Macmillan.

11) Smith, Adam. (1776). *The Wealth of Nations*. London.

12) T. Payne and Son (1789). *Introduction to the Principles of Morals and Legislation*. London.

13) Throsby, David. (2001). *Economics and Culture*. Cambridge: Cambridge University Press.

14) W. Strahan and T. Cadell. (1863). *Utilitarianism*. London: Parker, Son, and Bourn.

15) Wan, Martin (2023) guide-to-museum-lighting: https://www.ledyilighting.com/ar/a-definitive-guide-to-museum-lighting/