

الاستفادة من استخدام برامج التصميم في تحويل الأواني الوظيفية إلى أعمال خزفية

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الملخص

تأثرت الفنون المعاصرة بالتقنية بشكل واسع ونتيجة لذلك خرجت لنا اتجاهات فنية متنوعة، وكان فن الخزف من الفنون التي تأثرت بفلسفة العصر من حيث التقنية والمدارس الفنية. واحد هذه الاتجاهات لتفكيكية فقد أثرت فن الخزف وأتاحت له مداخل معاصرة لم تكن مطروحة من قبل، من حيث العلاقات الداخلية بين العناصر المتكررة وتناولها بشكل مبتكر داخل العمل الفني الواحد. ونظرا لأهمية التراث كقيمة ثقافية تعكس صورة المجتمع السعودي أصبح لزاما على الفنان أن يربط بين التقنيات التكنولوجية المعاصرة والموروث الثقافي. فتبلورت مشكلة البحث حول امكانية الاستفادة من برامج التصميم AutoCAD في استحداث أعمال خزفية مستوحاة من الاواني التراثية، فتناول البحث المنهج التجريبي من خلال ابتكار تصاميم لمفردات تراثية (الدلة) مستوحاة من المدرسة التفكيكية. وبالنسبة للخامة فقد عملت الباحثة على تحسين خواص أحد أنواع الطين وإجراء عدد من التجارب للتوصل إلى صورة محسنة ومناسبة للتطبيق على التصميم، فتضمنت الأهمية على تجديد الرؤية الفنية لفن الخزف المعاصر من خلال الاتجاهات الفنية المعاصرة بصفة عامة والاتجاه التفكيكي بصفة خاصة، وظهرت النتائج الخاصة بالبحث إمكانية الوصول إلى تحسين خواص الطينات بما يناسب التصميم، أما بالنسبة للتوصيات فإن البحث يؤكد على أهمية تحديث الرؤى الفنية الخاصة بفن الخزف مع المحافظة على الموروث الثقافي والهوية السعودية

الكلمات المفتاحية: برامج التصميم، خزف، دله، تفكيكية، تراث، اواني، ما بعد الحداثة

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Utilising modelling software to convert functional utensils into ceramic art.

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Abstract

Contemporary art has been widely affected by technology, and ceramics production is no exception. As an ancient art that originates from clay and other humble materials found in the ground, ceramics is considered one of the most adaptable art forms. Once it is realised how flexible ceramics as a material is, it can be easily altered into endless forms and shapes. Therefore, it is vital for ceramics practitioners to find a relationship between this wonderful material and the media of contemporary art, culture and modelling software or technology in general so that they can take their deformable art pieces to a whole new level. Such a relationship is worth investigating. Thus, for the purposes of this research, several ceramic pieces were identified using AutoCAD software to design authentic artworks with a contemporary look and feel. Throughout the research, these artworks will be examined from different perspectives. This will show in detail how art became not only a technical form or design but also a representation of expressive values stemming from diversity and unity. In this paper, the possibility will be discussed of experimenting with modelling software to develop traditional utensils into contemporary ceramic art by applying an advanced method of deconstruction. In addition, this paper will explain how technology is used to improve the quality of clay utilised in the production of art, producing a composite suitable to be formed, modelled, and dismantled in and through modelling software.

Keywords: Modellingsoftware, Ceramics, Dallah, Deconstruction, Traditional utensils, Postmodernism

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I. Introduction

The technological progress of the twentieth century affected art movements by granting them new vision. This opened horizons for artists to develop relationships between the arts and advanced technology. One of the movements that made an impact on postmodern art was deconstructivism. This movement introduced a philosophy, a form of contemporary theory and a context that could be applied to this kind of art. Ceramic art and its element could thereby be reconstructed/reproduced in an innovative way. It was one of the art forms influenced by deconstructivism. The purpose of applying this theory is to produce a static piece of ceramic design using modelling software. The use of such programmes confirms the interaction between contemporary ceramicists and modern tools. The advent of deconstruction has enriched ceramic art and provided it with contemporary directions that were not available before. As used here, it places a focus on the internal relationship between the repetitive elements and the way they were used to form unique art pieces. It does so by Applying this approach to local traditional utensils that are aesthetically transformed. This contributes to ceramic art becoming not only a technical form or style but also a representation of expressive values stemming from diversity and unity.

II. The theory of deconstruction and ceramic art

What is deconstruction?

Deconstruction is a philosophical approach that was established by literary critic Jacques Derrida in the 1960s as a method for reading literary texts and then turned them into a philosophical theory that influenced postmodernist art and architecture. The effects of this theory were reflected in wider cultural trends, as it required, in the field of politics, to deny European centralism and dismantle its structures, while in the field of fine arts ^[1]. Deconstruction is the method of understanding the relationship between a text and its meanings – or, in art, the relations between the material and design and the form and content. It consists of linking the reading of a text to what contradicts the intended meaning or structural unity of that particular text.

Postmodernist art aimed at consolidating aesthetics in a contemporary perspective. Artists who followed this movement generated aesthetic ideas based in environmental circumstances ^[2]. Deconstruction is a form of postmodernist art that puts the emphasis on changes to previous aesthetic standards, which become more flexible. Apparently, the concept of the creative process thereby changed completely, provoking controversy. The artist, described as a philosophic thought, used their artistic talent as a platform to raise issues about the nature of art and its function in society through art itself ^[3]. The deconstructive method will be applied in this research through modelling software to test using ceramic as a material.

Ceramic art

Clay is one of the oldest materials used by humans due to its availability and diversity of production methods ^[4]. It is undoubtedly one of the most widely used materials in the world ^[4]. Indeed, the use of clay in architecture, traditional techniques and cultural identity ^[5] is taken as evidence of human civilisation. The uses of clay can be divided into two main categories. First, it is used in construction. One of the oldest urban construction methods is building with mud or green, raw, non-fired clay, known as mudbrick. The latter is made by squeezing the clay into a rectangular mould for use as building blocks in traditional building. To improve its quality and bearing capacity, clay is made sticky by adding straw; manure is also added to reduce shrinkage and increase water resistance ^[5]. This building method was used in several

countries, such as Yemen and Saudi Arabia. This increases the strength of the buildings and raises them higher ^[6]. Mudbricks were used for building until the discovery of regular bricks.

The second main use of clay – the formation of utensils – was associated with domestic living. Its general uses were to preserve food and liquid during transportation, which led to improvement in the design and quality of production ^[7]. For instance, grease and tar were used to reduce the clay's absorbency, preserving liquid and food. Art of Ceramics is one of the arts that was developed after the general variables established by postmodern art. This contributed to the development of ceramic art from a craft into works presented at exhibitions and art shows. It is possible to artistically apply modern theories, such as deconstruction, to the production of ceramic works, given the nature of the material, which can be a result of another dimension by being manipulated to present a joint intellectual work between deconstruction and ceramic design techniques. Therefore, Postmodern art is one of the direct influences on ceramic art ^[3]. In order to make modern works that have a distinctive character, the history of ceramics and traditional production must be studied ^[8].

The effects of modelling on ceramic work

Technology has made a huge leap in contemporary art, prompting artists to search continuously and develop different versions of art. Thus, it occupies a vital role in the artist's interactions with updated tools. Which plays an effective role in artistic thought and performance and the emergence of new and advanced images in all fields, especially artistic ones. Technology provides many opportunities to find solutions that can benefit art generally and ceramics specifically. Utilising modern technology in ceramic art creates a contemporary intellectual language with artistic outcomes and formulations to keep up with the technological age. This enriched ceramic art and contributed to its transition from traditional to contemporary methods ^[9]. Distinctive outcomes emerged in contemporary art through the collaboration between technology and ceramics, which articulated technological thinking. This allowed ceramicists to study and test the relationship between technical thought and technological applications. In turn, this helped to create an intellectual harmony between ceramics techniques and digital design software, raising its quality and providing access to the highest levels of ceramics achieved either in aesthetic or functional outcomes ^[3].

Modern technology contributed to change the concepts underlying artistic approaches. Furthermore, contemporary ceramics deals with modern elements as tools that benefit the process of work, such as innovation through design programmes, including AutoCAD and 3D Max. Using these programmes is a fundamental approach in contemporary ceramic art to exceeds it limit ^[9]. The use of such Software to implement and translate ceramicists' ideas in an aesthetic, high-tech style by formulating and modelling intellectual content to reach an advanced level. For instance, modelling a design on one of the software's mentioned above can be produced and printed through 3D printing. Which can result in enhancing ceramics by reducing the time and quantity of materials needed. This is one way where designing was benefited from such technology.

In addition, ceramic works have become characterised by a contemporary aesthetic philosophy that draws the observer to different perspectives. As a result of using technology for ceramic output, ceramics is liberated from the hardness of expression that was once dictated by the nature of the material. The excessive use of these techniques may negatively affect ceramic art by depriving it of part of its identity and original creative outcomes. Therefore, we note that technology and the techniques it enables are in harmony with ceramic art. It has both technological and traditional perspectives, and this illustrates the importance of the role of technology in ceramic theory and process.

III. Method and methodology

The method of this study is a combination of investigating modelling software and carrying out a visual analysis of traditional pots. These approaches are used to apply deconstructive styles to develop traditional materials resulting in renewed design.

The methodology of the research was designed in two parts:

- Choosing the utensils that will be worked on, experimenting with the deconstructive method in the AutoCAD program and verifying the results. This was the application of the design.
- Working on improving the material to comply with the design that was produced in the first stage. The material chosen was clay, and the technique was thin layers.

IV. Experiment

Modelling software and design

The experiment was divided into two parts. The first part was the design stage, in which a traditional utensil was chosen and converted from a functional piece into a work of art. Specifically, an Arabic coffee dallah (Figures 1). A dallah is a Saudi symbol and an important element in the tradition of Arab hospitality. It was chosen as it is compatible with the data required in the program for the deconstructive approach. These data are referring to the pot dimensions, thickness and symmetry of its design. The measurement of the Dalla was taken and added to the AutoCAD to create a front elevation of the dallah design. This elevation was then divided into multilabel cut sections creating 5 different sections that can be resampled to create a deconstructive an artistic new design of the traditional dallah (Figures 2).



Fig 1: The dallah: an Arabic coffee pot

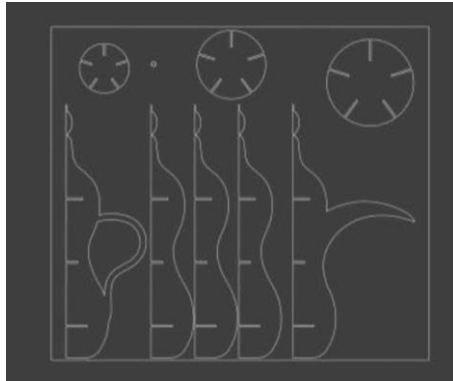


Fig 2: The dallah design in AutoCAD

Material improvement and production

At this stage, the design from the software of the dismantled dallah (Figures 2) was moulded and casted with medium white clay. However, the clay form was not suitable for the project design. Hence to reach satisfying result certain percentage of subsidising materials were added with the aim of reaching a specific consistency with clay that matched the required thickness in the created design (Clay experiment schedule). Therefore, it is necessary to understand the nature of the clay as a design material.

Characteristics of local clay

Clay is formed in nature through geological processes. Influenced by direct factor like where it is found, i.e., whether it is found on a mountain or by the riverside. Whereas indirect factors include minerals the material was exposed to and time. It is essential to analyse each region individually, as clay varies according to the geographical area. Clay in the kingdom Saudi Arabia (KSA) is likely to be existed since the Permian era ^[1], leaving deposits in most areas of the Arabian Peninsula. The geographical diversity of Saudi Arabia has contributed to the diversity of the clay formed in terms of textures and colours. For instant, The marine retreat of the Red Sea's coast helped raise the percentage of kaolin in the clay so that it could be produced as bricks. The different characteristics and a gradient of colours, ranging from beige to dark red. The substance found in the central of KSA is red clay, which can be fired at 1,050°C, making it suitable for art and industrial use. The type found in the eastern part of the Kingdom is light-coloured clay, which has manufacturing potential; it is applied in stoneware, which can be used in health facilities ^[10].

To sum up, after explaining the classification of local clay types and their nature, we note that these types are not compatible with the intended use of the clay in the dallah project. Therefore, it is desirable to raise the efficiency of the used clay in a practical experiment and by following certain measures, as illustrated within the schedule below:


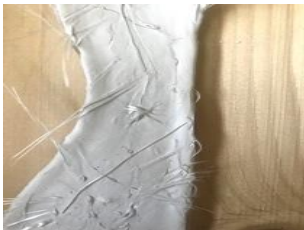


Clay experiment

Experiment No.	Clay	Materials added	Percentage	Application description	Result
1	Liquid white clay	<ul style="list-style-type: none"> • Fibres • polyester 	5%	Fibres are added to the clay after cutting it	The fibres are used to support the tenacity of the clay, but a trace is left after burning (the result was not approved).
2	Liquid white clay	<ul style="list-style-type: none"> • Fibres • polyester 	3%	Fibres are added without cutting the clay after pouring it into the upper part of the shape	The percentage of fibres was reduced to support the shape after drying with a thickness of 3 mm. However, the fibres left an impact on the surface of the mud after burning (the result was not approved).
3	Liquid white clay	<ul style="list-style-type: none"> • Feldspar • Ceramics • kaolin • fibre • polyester 	20% 20% 20% 1%	All materials were chosen to improve the resistance of the liquid and increase its transparency.	Materials were added to the liquid with hot water to reduce the density of the liquid. The liquid became thick and foamy, rapidly becoming consistent and drying, but the liquid colour became greyish, and the trace of the fibres is still clear with slight shining.

4	Liquid white clay	<ul style="list-style-type: none"> • Feldspar • Chinese clay • kaolin 	<p>10%</p> <p>10%</p> <p>10%</p>	Materials were added one by one after being mixed with the clay slurry	<p>The clay became less dense and non-foaming, started to have a new consistency and dried in a timely manner, with the ability to be poured at a thickness of 4 mm.</p> <p>The effect of kaolin was evident in the colour and consistency during burning, but the clay was slightly porous, and the application of glaze is not suitable.</p>
5	Liquid porcelain	<ul style="list-style-type: none"> • Feldspar • Chinese clay • kaolin 	<p>5%</p> <p>10%</p> <p>20%</p>	The ratio was changed to test the kaolin's effect	<p>The clay became bright white and cohesive after being fired at a temperature of 1060°C .</p> <p>It also became heat-resistant and possibly transparent if fired at a temperature of 1305°C.</p>
6	Clay porcelain powder	<ul style="list-style-type: none"> • Feldspar • Chinese clay • kaolin • silicate 	<p>5%</p> <p>10%</p> <p>20%</p> <p>2%</p>	The dry materials were ground together; 50% hot water was added and mixed with the silicate	<p>The liquid became light and could not be poured into the mould. Its colour became yellowish, but after 5 days, the liquid solidified and could be poured at a thickness of 5 mm.</p>

By applying these measures to increase the flexibility, improve the fusion and bonding characteristic of the used clay, the result was a production of clay that has certain properties that complied with the design requirements explained in the previous sections and illustrated in detail in the following table:

Firing results

Experiment	Photos after firing	Cone degree	Thickness
1		06 = 999c	6 mm
2		05 = 1046	4 mm
3		06	4 mm
4		Glazed 04 = 1060 Bisuc 06	4 mm

5		04	3 mm
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V. Results

The experiment demonstrated that the produced clay formula could reach a high temperature and was suitable for the intended artistic use. The benefit of using modelling programmes was that they help to produce ceramic works with a unique character and renewable outputs. Applying theories such as deconstruction contributed to raising the level of artistic expression and thus producing contemporary ceramic outcomes.

As for the compositions, understanding the nature of the raw materials helped in highlighting the artistic works and distinguishing the ceramic outcomes. The experiment successfully produced the required material by the fifth combinations when the ratio of feldspar was reduced to 5 % and ratio of kaolin was doubled, which fulfilled the design and theory of the scientific experiment by producing a 3-mm-thin slab and applying it in a contemporary ceramic work of art.

VI. Discussion

The heritage of the KSA can be captured in the production of contemporary ceramic art. Focusing on contemporary movements and philosophies, such as the deconstructive school, enriches ceramic art with contemporary artistic formulations through the repetition of elements and achievement of unity between them. The diversity of local traditional elements can be used to create ceramic pieces within a contemporary style inspired by inherited features. We created contemporary ceramic artworks through the employment of the philosophy of the deconstructive movement in art. The local artistic vision of contemporary ceramic art was practically updated by demonstrating the association between postmodernism and ceramic art. Thus, the results were applied in the research project (Figures 4, 5). Art is important to reflect the cultural value of Saudi society, by connecting contemporary culture with tradition through art. Furthermore, this relationship between originality and the contemporary in modern art and design can be articulated through the art of ceramics. Thus, ceramic art becomes not only a form or a technical style but also an expression of values stemming from diversity.

In this paper, I have addressed the lack of research on the possibility of drawing from the deconstructive movement to develop ceramic works inspired by the heritage of the KSA. This research used the descriptive analytical method in dealing with contemporary artwork that were influenced by the deconstructive approach. As for the experimental method, it involved

creating designs for a traditional product (the dallah) that were inspired by the deconstructive movement. Regarding the material, the researcher developed features of one of the types of clay and conducted several trails to produce an improved and appropriate material for the created design. The results of the research demonstrate the possibility of improving the characteristics of different clays to match a certain design. In summary, the research concentrates on the importance of updating artistic visions of ceramic art while preserving the Saudi cultural heritage and identity.



Fig 4. The project outcome: a design made of ceramic slab, white glaze, fired electric kiln (04)



Fig 5. Outcome of the clay experiment: glazed ceramic slab, verity of firing between 06 and 04 electronic kiln.

VII. Conclusion

This research relied on several elements that were linked to the research methods, including the study of functional utensils and the extraction of a piece of art, through design programmes. A different medium was chosen to carry out the work and understand its nature, such as the medium of digital modelling software and the medium of ceramic studies. However, the most important goal was to benefit from local wealth. This study will benefit local research by looking at the different elements of the study introduced to the scholars who are interested in the Saudi heritage, which would create useful research and artistic dialogue.

There are some challenges that I encountered as a researcher, such as the lack of availability of materials, but they were replaced by alternative materials. There was also a lack of information about the traditional utensils, so I relied on collecting information from the sources directly.

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