

MERGING THE ARTS OF HAND EMBROIDERY WITH PAINTING FOR CREATING INTERCHANGEABLE MODULAR FASHION

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Abstract

The study presents the preparation of an experiment to launch a new fashion trend, which can be applied to many women's clothing items, especially the dress and the abaya, as they are the most widespread clothing items in Arab and Islamic countries. The new trend allows for transforming in design using modules which decorated with embroidery in various forms. The idea was generated by the researcher teaching a group of special needs students, deaf and dumb, with the course "Embroidery on Fashion" in the fall semester 24/2025 in the Fashion Design Program at University of Nizwa. The students showed brilliance in design and embroidery stitching. Among the lessons were: 1) The topic of painting through embroidery' threads, and the topic 2) mixed-media embroidery. The students presented distinguished artworks that can be used in fashion. Also, due to the researcher's supervision of a student project granted by the Ministry of Higher Education in the Sultanate of Oman on the modular fashion, finally motivated by her proposed Strategy on the Mosaic Fashion. The idea of the current study has been oriented to prepare a new fashion trend in one of the types of transforming fashion, which is the modules fashion decorated with painting embroidery, as the proposed trend is characterized by the possibility of substitution among the modules and thus the possibility of appearing in different styles for the same garment, the garment contain some modules that can be attached/ detached. The study was based on the actual application of the hand embroidery course students, and on experiments that the researcher applied through generative artificial intelligence, where some modules were decorated with Claude Monet's embroidered flowers, and the possibility of replacing them -as an example- with other embroidered modules inspired by Piet Mondrian's geometric shapes. The significance of the study represented in adopting experimentation in the field of fashion, the current experience can be used by students of fashion programs. The study adopts the experimental, developmental and exploratory approach.

Keywords: Hand embroidery, painting embroidery, mixed-media embroidery, generative AI design, modular fashion, interchangeable fashion, students with special needs.

1 INTRODUCTION

Embroidery is considered one of the first fine handicrafts known to man since ancient times, it is one of the main methods of decorating the fabric' surfaces through various stitch shapes and thread types. Despite the technological progress accompanying the twenty-first century, and the advanced techniques of machine embroidery, digital printing and even 3D printing, the art of hand embroidery and its applications are still keen on by the largest international fashion houses and the most famous brands that compete in the precision of haute couture techniques, especially needlework such as embroidery with threads, pearls and other materials. The aesthetics of hand embroidery depend on construction of the decorative design, formulating it with shapes, and selecting the appropriate stitches for embroidery.

Modern techniques have emerged in recent years in the art of embroidery, allowing manipulation of conventional stitches, and also combining embroidery with other arts, at the same time, new approaches of design as general have been emerged, such as the sustainable multi-modular approach. The current study experimenting to utilize of these recent trends through exploring the possibility of obtaining sustainable fashion with creative aesthetics for proposing an unconventional style. The designer uses imagination' capacity and skills to create designs that are characterized by novelty, modernity, acceptability and feasibility.

1.1 Study Problem

To what extent can the art of embroidery, the art of painting and the modular method, combining together for proposing contemporary sustainable fashion trend?

1.2 Study Objectives

-Presenting students' applications in implementing designs that combine the arts of embroidery and painting:
A) painting by threads B) Mixed-media embroidery, combining embroidery with painting.

- Identify the new embroidery techniques.
- Identify some experiences of multi-modular fashion.
- Designing a multi-modular fashion whose aesthetics are based on embroidered modules.
- Researching the possibility of developing the proposed designs to interchange the embroidered modules and thus obtaining diverse aesthetic configurations for the same garment.

1.3 Study Significance

-Enriching the field of fashion design by combining embroidery, painting and modularity method, which opens new horizons for creators and producers.

- The multi-modular style is one of the transformative fashion styles that involves the application of sustainable development.
- The possibility of developing simple hand embroidery applications - such as those presented by the study' sample students - by implementing them as separate modules that can be used to ornate clothes, and this productive activity can be developed in a entrepreneurial project.

1.4 Study Methodology

This study adopts the experimental development method, where:

- Students applications; some embroidery designs that involve the art of painting (mixed-media embroidery - threads painting) by the students with special needs in the course "Embroidery on Fashion", students' applications of modular construction samples, students of the course "technical arts", at the University of Nizwa.
- Author proposing; embroidered modules fashion, whose aesthetics depend on artistic embroidered interchangeable modules attach/detach by AI generative design.

2 LITERATURE REVIEW

In (Abdel Aziz, and Harraz, 2017) the study aimed to identify the aesthetic values and symbolic connotations of Nubian folklore motifs, and to attempt to benefit from these aesthetic values in creating contemporary decorative designs for university students' clothing, and to implement these motifs using the canvas stitch. One of the most significant results is the preparation of a collection of designs inspired by some symbols of Nubian art (triangle - crescent - star - hand - palm tree) in the form of motifs. These motifs are characterized by being transformative and can be disassembled, fixed and redistributed on the garment in more than one way, which is what the current study also presents through the multiplicity of embroidery modules which construct the garment.

In (Nadabsbs, and Cileroglu, 2017) the research experimented the technical requirements of using modules in clothes, which allow style and size change, the findings indicated to some considerations, such as designed skirt model should in the same length when interchange between the block parts. () Chen, and Lapolla, (2020) explored that design focusing on transformability allow the wearer to create various configurations with no need for sewing, the paper investigated the modularity method from three aspects: The shape, the cutting and the fabrication.

In (Suleiman, and Mahran, 2018) the research problem is represented in the possibility of utilizing the motifs, materials and methods of Egyptian folklore to design and produce fashions for contemporary women and to reach the opinions of specialists and consumers regarding these designs. The research aims to identify the motifs values and symbolic connotations of the symbols, materials and methods used in Egyptian folklore and to attempt to employ them in creating a collection of contemporary designs for women's fashions. This study has benefited the current research in identifying some methods of formulating aesthetic motifs in contemporary fashion.

In (Mohamed, and Hussein, 2019) the study aimed to identify the characteristics and techniques of the metal wire shaping method, and to implement some designs formed with metal wires using different embroidery stitches. The work was carried out in three stages: 1 - The stage of shaping and sculpting with metal wires, 2 - The stage of embroidery on the outer borders of the metal piece, and finally 3 - The stage of embroidery to fill the internal spaces. the current research benefited from this study in identifying one of the patterns in which the art of embroidery was applied to produce separate embroidered decorative units that can be installed and removed (attach/detach) on any artwork to enrich its aesthetics, as is followed in the current study with fashion.

Hassaan, (2020) proposed a new strategy, namely (Mosaic Motifs Structure) with the objective of opening a new innovative entry for students' applications in the courses of the fashion design program, so that the proposed method can be applied with many projects in all fashion courses, where the student learns the technique and then apply it after training and mastering, under the name (mosaic), as well as the current study following the method of interlocking modules which is somewhat similar to it , in addition that current study consider sustainability principles and the possibility of interchanging the modules.

In (El-Dawi, and others 2021) the research aims to identify the techniques of three-dimensional embroidery, and to prepare a collection of decorative designs that suit artworks. The study urged to renewal and innovation in embroidery applications and to avoid conventional aesthetics. In (El-Dessouki, and others 2024) the study aimed to utilize ancient Egyptian motifs in souvenirs designing and apply the designs by the punch needle, 5 products have been produced inspired by: lotus, Horus, scarab, and pyramid. A questionnaire has been designed to measure the functional and aesthetics aspects of the proposed designs by sample of both: fashion designers and consumers.

Al Qurashey, (2022) experimented applying modular fashion inspired by Islamic geometric patterns in repetitive relations (circular- vertical- horizontal- axial), the researcher/designer applied two techniques: 1) simple geometric shape (rectangle- square-hexagon) 2) complex geometric shapes (rosette- star), the results are for first technique, the simple one which evoked more aesthetics values of Islamic mosaic. Al Saied, and Al Manie, (2024) presents the sustainable fashion' properties which supporting sustainable practices, collection of transformative fashion had been designed, and measured by fashion designers and consumers.

In (Al Gohery, and El Anzy, 2023) the study aimed to create evening wear using leather decoration techniques such as laser cutting, printing, and three-dimensional embroidery together, and measuring the acceptance of consumers for the proposed designs, the decorative design inspired by Najdi doors.

In Hassan's study (2024), the exploratory approach had been applied with students to experiment various techniques for artistically formulations with felt, the experiment aimed to utilize felt in designing and producing fashion accessories such as bow bags and jewelry, this study is consistent with the current one in opening entries to creative experimentation of student' applications that can be developed to small and micro-entrepreneurial projects.

In (Darwesh, 2024) the study aimed to highlight the aesthetic and formative value of the art of embroidery on plastic canvas, The study aimed to highlight the aesthetic and formative value of the art of embroidery on plastic canvas, open new horizons for the development of handicrafts through experimentation, and present unconventional ideas for a handbag with high values.

3 THEORATICAL FRAMEWORK

3.1 Modern Hand Embroidery

Embroidery is defined as an artistic method of decorating fabric using threads and special needles whose thickness and length vary according to the type of fabric and stitches used, threads vary in type from natural, synthetic and mixed fibres.

Modern embroidery is a great creative outlet. With embroidery tools, modern embroidery is even easier. Contrasting colours are an important part of creating shading and texture in modern embroidery designs, for

shading techniques it's preferred to use contrasting colours, this enhancing in creating realistic-looking portraits by thread. Colour blending with thread is an important part of practicing modern embroidery, (Turner, 2021) Conventional embroidery techniques can be adapted to suit more modern embroidery designs, the stitching style can be developed from some basic embroidery stitches, such as the French knot, for creating three-dimensional balls in embroidery, stem stitch bullion stitch, buttonhole stitch, satin stitch, pinwheel stitch, fishbone stitch. and backstitch as well, they are simple but offer more experienced embroiderers new techniques, embroidery is an art suitable for creating free hand art without a strict pattern.

Almost conventional embroidery is quite flat but recently embroiders utilized stitches for creating embroidered three-dimensional-looking. Many creative works in 3D embroidery techniques can be observed through visual search engines such as Pinterest. The technique is based mainly on forming the thread around the needle in various ways, repeating the passes, then fixing it to the fabric, fabulous applications have been launched as embroidery on photos and pictures, embroidery on tulle, a sheer fabric with large holes is certainly a different experience and aesthetics with exciting possibilities of layering, and embroidering by thick thread on the racquets.

Line's art suits being applied through embroidery, requiring simple stitches, recommended for beginners. Many products have emerged from the applications of modern embroidery, including, for example, art painting combined with hand embroidery, gifts with embroidery scripts, bookmarks, monograms, abstract Self Portraits, cherished memories painting, and marble patterns, the last by the satin stitch. (Landies, 2022)

Many modern definitions have begun to appear on the scene when describing and marketing contemporary embroidery works, especially those that are integrated with art, for example; free-style embroidery of mixed media- Spring floral - art desert - abstract woman art - digital pattern lines - coral art- abstract embroidery inspired by the organic textures of coral reef- neon dream digitally enhanced abstract embroidery art- and others. Many definitions also when describe the embroidery trends, for example; free-motion embroidery when the needle is moving freely allowing for unique designs, 3D embroidery using padding to create raised, textured designs, adding a dynamic, tactile appearance to the design, and Combining embroidery with other art forms, such as painting, and beading which call mixed media embroidery, these trends push the boundaries of conventional embroidery, create visually texturally rich artworks. (*The Art and Science of Fabric Embroidery*, 2024) Sharon Boggon one of the One of the most prominent practitioners of the art of mixed media embroidery, in which she applies some of distinctive techniques in contemporary embroidery, adopting the approach of combining the art of embroidery with other arts, she also employs many materials in her paintings, including natural, used materials, and of course painting. (Boggon, 2020)

3.2 Modular Fashion

Modularity considers one category of transformative fashion categories, which includes: Reversible fashion, multi-design fashion (with: snaps- buttons- rubber bands- zippers), multi-function, high- technology transformative fashion, and modular fashion (Al Saied and Al Manie, 2024). It is worth noting that all these categories of transformable clothing belong to what is called D4S (Design for sustainability), as they control consumption through transforming from one configuration to another in the same clothing, the proposed project in the current study is an example, where the author proposes changing the appearance of the clothing through its modules, the modules are decorated with artistic embroidery, which can be applied to clothes easily and with personal effort.

The multi-modular approach includes some concepts, including:

- Organizing ideas, rearranging components, and presenting them in a new structure.
- Looking at the design through imagination in more than one combination and imagining unconventional visions.
- Developing ideas, ensuring that they are wearable every time.
- Each new design carries aesthetic dimensions that do not limit the functional value of the garment.

Achieving the concept of interchangeability, assembly/disassembly or attach/ detach. Interchangeability through modules can be applied using a variety of fastenings such as Velcro, buttons or snaps. There are specific fashion brands for modular fashion production; Konundrum, Riot Division and Orbitgear. (*What is Modular Clothing?* 2023)

In Hassan's (2024) study of modular fashion, she presented a new vision for designing a women's abaya, in which the artistic formulations of the abaya' parts are multiple, through attach/detach some parts to the abaya; sleeves - cuffs - cuts - some additions such as pockets and collars, means assembling and disassembling the basic parts in the abaya's composition. The proposed designs considered the factor of

diversification in the parts' materials, the separable and the alternative parts, including plain- floral-geometric, the materials should be compatible with each other. The current study is characterized by applying interlocking method, not fixing tools such as buttons and snaps, these modules are small decorative modules that are added to the basic garment, they are decorated by modern hand embroidery that combines embroidery with painting.

4 STUDY'S EXPERIMENT

4.1 Merging arts of Hand Embroidery with Painting

Applications by special needs students, deaf and dumb, they presented great potential in painting through embroidery threads, remarkable skill in selecting the proper stitches, significant raised layers/extra depth, and high precision in embroidery y stitching.

4.1.1 Thread Painting

The researcher assigned the students to select natural scene by one painter and copy the painting features on linen fabric, determine the suitable stitches method for each part of the painting, It is worth noting that the students were allowed to use some of the well-known stitches that were studied, such as the knot, chain, stem, seed, and others, the students were allowed to use thread stitching also according to her artistic taste, thus providing an opportunity for experimenting using threads on the fabric freely, and creating various artistic textures. Following figures present the students artworks, Fig. (1:8):



Fig. (1)



Fig. (2)



Fig. (3)



Fig. (4)

Fig. (1:4) Students' thread painting works inspired by the nature painting. Embroidery works by: University of Nizwa, Fashion Design Program, students with special abilities.



Fig. (5)



Fig. (6)



Fig. (7)



Fig. (8)

Fig. (5:8) Students' thread painting works inspired by the nature painting. Embroidery works by: University of Nizwa, Fashion Design Program, students with special abilities.

4.1.2 Mixed-Media Embroidery (embroidery combining with painting)

The students' embroidery works: the author/professor assigned the students to colour the fabric first, then draw or print the artwork' composition, using the embroidery stitches freely, combine the conventional stitches with creative thread motions Fig. (9:14).



Fig. (9)



Fig. (10)



Fig. (11)

Fig. (9:11) Mixed-media embroidery, combining embroidery with painting. Embroidery works by: University of Nizwa, Fashion Design Program, students with special abilities.



Fig. (12)



Fig. (13)



Fig. (14)

Fig. (12:14) Mixed-media embroidery, combining embroidery with painting. Embroidery works by: University of Nizwa, Fashion Design Program, students with special abilities.

4.2 AI Generative Design Applications

Divided in two categories, the researcher applied Microsoft Bing generative design for proposing fashion modular designs which adopting the modular method in the construction, and embroidery technique as decorations. Following figures present the proposed designs:

Category (A): Modules fashion, decorating with Monett embroidered flowers, Fig. (15:21):

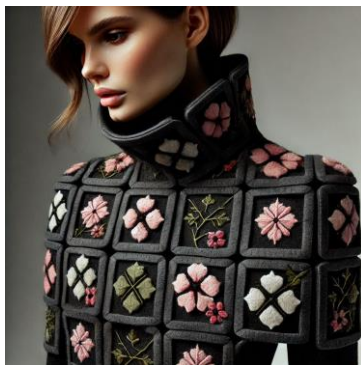


Fig. (15)



Fig. (16)

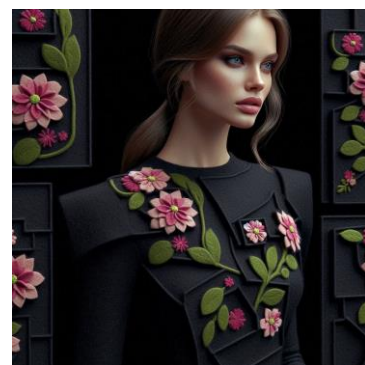


Fig. (17)

Fig. (15:17) Embroidered flowers inspired by Monett painting, adopting modular method. Prompt by the author: Rehab Hassaan, Microsoft Bing



Fig. (18)



Fig. (19)

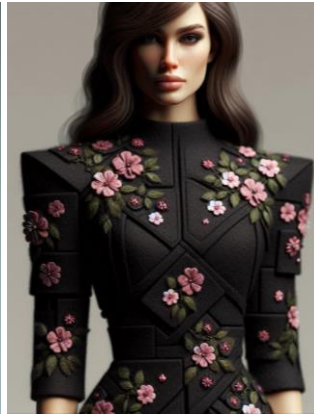


Fig. (20)



Fig. (21)

Fig. (18:21) Embroidered flowers inspired by Monett painting, adopting modular method. Prompt by the author: Rehab Hassaan, Microsoft Bing

Category (B): Geometrical Modules fashion, decorating with embroidered flowers, Fig. (22:26):



Fig. (22)

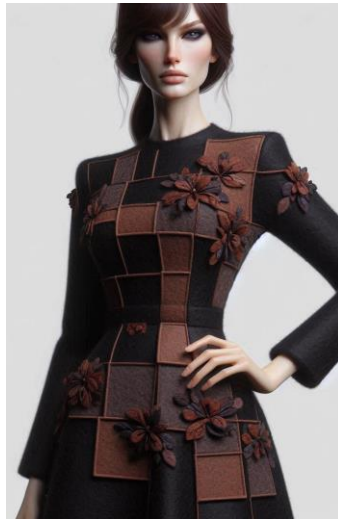


Fig. (23)

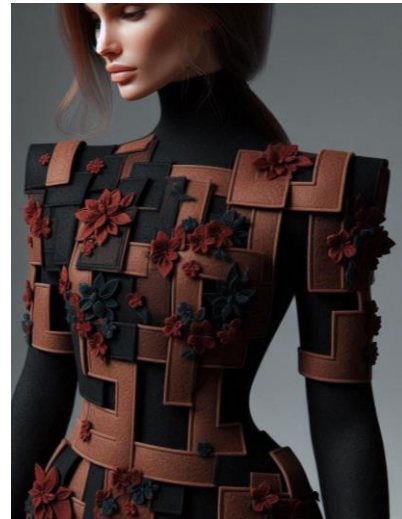


Fig. (24)

Fig. (22:24) Geometrical modular interchangeable fashion. Prompt by the author: Rehab Hassaan, Microsoft Bing

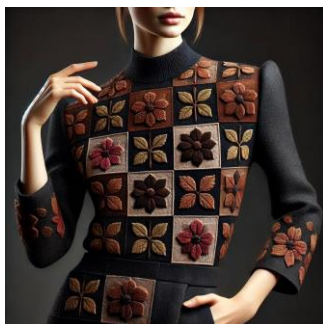


Fig. (25)



Fig. (26)



Fig. (27)



Fig. (28)

Fig. (25-26) Geometrical modular interchangeable fashion. Prompt by the author: Rehab Hassaan, Microsoft Bing

Fig. (27-28) Interlocking the geometric decorated modules. By: Rehab Hassaan

4.3 Interlocking Modular Experiment

The author applied interlocking method with the student of the course “Technical Works” of the same

semester -Fall 24/2025, Arts Education Program at University of Nizwa, this application aimed to introduce Art Education' students to some of the methods in which art merges with engineering, students had to conduct precise calculations to draw the dimensions of each module, as well as to adjust the overlapping parts between these modules with high accuracy (Fig. 29:35). Therefore, the current research' experiment actually casts its shadows among several specializations, how can students of the Hand Embroidery course -Fashion Design Program combine embroidery and painting, and how can students of the Technical Works course- Art Education program combine art and engineering, and finally the overall goal behind the current experiment, creating a proposed fashion collection based on the method of interlocked modules, to form one garment, the aesthetics of which are renewing through replacing the embroidered modules, which ornate some of its parts.



Fig. (29)



Fig. (30)



Fig. (31)

Fig. (29:31) Interlocking modules patterns. By: University of Nizwa- Art Education Program, "Technical Works" Course", Fall 24/2025.



Fig. (32)



Fig. (33)



Fig. (34)



Fig. (35)

Fig. (32:35) Interlocking modules patterns. By: University of Nizwa- Art Education Program, "Technical Works" Course", Fall 24/2025.

5 STUDY RESULTS

Through the study, the main research' question was answered; the possibility of proposing a multi-modular fashion whose aesthetics depend on the interchangeable modules decorated with hand embroidery. It was proved through the students' applications in contemporary hand embroidery, which combined the art of embroidery and the art of painting; thread painting / and mixed-media embroidery, as well identifying some modern embroidery techniques, that the students can produce creative designs in painting embroidery.

It was also defined the multi-modular fashion, as well as the students' various works for some applications of the interlocking system to achieve the multi-modular method. At the end of the experiment, the researcher/designer proposed a fashion collection were designed by generative artificial intelligence for achieving the research goal, sustainable innovative fashion whose aesthetics depend on interchanging interlocking modules decorated with hand embroidery, the designs were prepared for implementation in the next stage.

6 THE RECOMMENDATIONS

1. Academics' concern to acquire continuous recent knowledge and skills in design and art fields.
- 2- Academics' keenness to develop creative thinking and application with the students, through continuous renewal of the contents of the curricula, as students are not on the same level of experience as professors, professor must apply contemporary trends and even propose creative applications on an ongoing basis.
- 3- Displaying the proposed innovative applications through art exhibitions and research.
- 4- Producers and decision-makers' inserting the applications of new creative methods proposed and presented by students under the supervision of their expert professors.
- 5- Financial support from the competent authorities for creative students to apply artistic projects that meet the needs of society.
- 6- Completing the proposed project of the current research to the second phase in which there is actual implementation and marketing of the products.

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