Adapting the Aesthetics of Weaving in the Development of the Mineral Light Unit as a Small-Scale Production Project Baseding on the 2030 Sustainable Development Strategy

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Abstract

Textile has an important role since the dawn of history, as it is considered one of the oldest means that man has been guided to, and his association with his surrounding environment according to his needs made him think about meeting all these needs, and he used the art of weaving with its various techniques and methods with an aesthetic sense, which causes tactile aesthetic effects, giving aesthetic richness to the surface of the textile workpiece. The material of the insulated wire is closer to the textile threads in the properties and forms and adapted in the work of metal textile artifacts, it has been possible to form and invest in the development of metal artifacts such as various lighting units using weaving techniques because of its multiple properties that distinguish it from other materials, including the multiplicity of colors and diameters and ease of malleability, and therefore this research will invest the aesthetic and functional characteristics of the metal wiresZola with weaving technology, and will take advantage of the creative properties of some simple textile compositions, as well as aesthetic effects that can be achieved through the distribution of densities and the achievement of spaces, and the distribution of colors, because of their aesthetic values and the application of new techniques in the development of design visions keep pace with the functional and aesthetic requirements of the metal lighting unit to develop the concepts of beauty and plastic values commensurate with our current era, And awareness of the importance of renewal and creativity to develop production through the dissemination of a culture of support for small projects and self-employment for students studying the field of metalworking faculties of specific education, and in this context, the research will be exposed to some simple textile structures used in the implementation (gentlemen and cooler..) The research was presented in the framework of the descriptive analytical and experimental methodology in order to review some of these textile structures, in addition to addressing some of the concepts of plastic art for the aesthetics of

weaving in the light of metal formation, and a brief study on what Small productive projects, their importance, types and characteristics, with a selection of metal lighting units implemented for students of the final stage of the college.

Keywords: weaving, lighting unit, small projects, sustainable development.

1. Introduction

Handmade weaving is one of the oldest means that man has been guided to as a human activity, as the fabric had an important role from the dawn of history, and the human link to his surrounding environment according to his needs made him think about beautifying his life, and he used the art of weaving with its various techniques and methods with an aesthetic sense that causes tactile aesthetic effects, giving aesthetic richness to the surface of the textile workpiece, until it became a means of manufacturing most of what he wants from his living needs, so the job was associated with beauty Through weaving, this style still retains a set of properties unique to it without other means of forming.

The technique of weaving has become a means of artistic creativity distinguished during the human heritage extended over successive civilizations starting from the ancient Egyptian times and the Coptic and Islamic era to the modern era, and Egypt is famous for spinning linen fibers and weaving them with high accuracy and is characterized by gradient decorations and overlapping colors, and in the modern era the artist was interested in some textile compositions to build his artwork in addition to eating new materials such as metal raw materials that were used in many different areas of life such as wires and metal slides ...

Where (Sherif Massad Aref, Abeer Mohamed Afifi) mentions that "whenever the artist has a fertile imagination, the fruit of creativity is high, which makes the viewer and connoisseur of the artwork feel its richness, whether in the idea or in the use of materials and tools well." (Sherif Massad Aref, Abeer Mohammed Afifi (2014), p. 96)

He was also interested in creating plastic media, "and he experimented in a technical framework that governs the relationship between the material and the style of performance based on variables that occur to him aesthetic values, and the most important of these variables is the diversity of threads or wires in terms of diameters and their thickness, distribution density, type of twirl and color arrangement, and the difference in tension, in order to obtain aesthetic values such as unity, balance, rhythm andpeople... (Mona Juma Hussein (2015), p. 108), which prompted the artist to think and experiment to extract aesthetic creations that enrich the textile surface of the metal work, and since dealing with metal wires is the treatment of textile threads, where both metal wires and weaving threads are similar in thicknesses and diameters, it has prompted the artist to think about the use of metal wires as weaving threads, and his imagination has inspired him to weave using metal wires to form a stereoscopic metal woven that takes The same characteristics of the textile workpiece in terms of aesthetic shape and functional performance.

Since the insulated wire is closer to the textile threads in the properties and forms and adapted in the work of metal textile artifacts, it has been possible to form and invest the insulated wire

with varnish in the development of different metal artifacts using weaving because of its multiple colors, this material shows technological progress and the accompanying discovery of many materials and methods, as it provided a fertile field for renewal and innovation, so concepts and aesthetic dimensions were formed towards addressing the shape and functional performance of the material to confirm the plastic and functional values in the artifacts Mineral .

For all of the above, the research has invested the aesthetic and functional properties of metal wires with normal weaving technology, so in this research will take advantage of the creative properties of some simple textile compositions and their derivatives, as well as the aesthetic effects that can be achieved through the distribution of densities and the achievement of spaces, and the distribution of colors, because of their aesthetic values and the application of new techniques in the development of design visions that keep pace with the functional and aesthetic requirements of the metal lighting unit to develop the concepts of beauty and plastic values in line with our time The current to make a real change in the product to benefit the consumer, and raise awareness of the importance of renewal and creativity to develop production.

Since the graduate of the faculties of specific education (art education) in different universities is the main goal of the educational system to prepare a distinguished teacher / specialist who keeps pace with technological developments in his field of specialization, not only in the field of teaching, but in the field of small projects in Egypt, which is the educational output provided by the institution to the community, the institution must strive to prepare and qualify a graduate who is able to produce in various fields of plastic arts or in one of these fields and how to refine his skill and training To qualify for the establishment of a small project and make it able to break into the labor market and contribute to advancing economic development in Egypt.

It contributes to advancing economic development in Egypt, especially in the current situation, where "the rates of economic development have declined on the one hand and interest in small and medium enterprises has increased significantly, as it represents the nucleus towards the establishment of large industries, and supplying them with intermediate requirements, as it is one of the main entrances to economic and social development, and an effective tool to increase the average per capita income and then raise its standard of living and eliminate unemployment" (Central Agency for Public Mobilization and Statistics (2016),p2.

Here we address small projects that are held on the hope of developing the economic movement of graduates of Egyptian universities, and small projects play a major role in providing job opportunities, supporting development and creativity, and achieving a structural balance of productive activity, as these projects depend on the formation of a simple technical product by employing the energies of graduates and developing their skills in light of the available capabilities in order to achieve excellence. It is worth noting that small projects are considered one of the most important entrances within the sustainable development strategy 2030 to confront the problem of unemployment due to the fact that it is characterized by low capital and the capabilities required for its establishment. Therefore, attention must be paid to such projects and the preparation and rehabilitation of a generation capable of innovation, creativity and production in various fields of plastic arts in general and in the field of metalworking in particular, and from this point of view it was found that it is necessary to find ways to support the idea of small projects for students And young graduates through their training and upgrading the level of their

performance and providing them with the necessary skills to practice their work at the highest level in line with the requirements of the labor market, where in this research will be implemented a project to produce metal lighting units using weaving technology for students of the last year of the college, which makes them able to establish a small productive project that benefits them after graduation, achieving them an increase in average income and then raising the standard of living.

Search problem:

Through the above, researchers see that by adapting the techniques and aesthetics of some simple textile structures (gentlemen and cooler) using metal wires insulated with varnish because of their properties that distinguish them from other materials, it can enrich the metal work by revealing the aesthetics of those compositions to produce new metal lighting units as one of the small projects that benefit the graduate after graduation.

Accordingly, the research problem is determined in the following question:

- To what extent can we benefit from adapting weaving techniques and aesthetics in the development of the metal lighting unit as a small productive project within the framework of the 2030 Sustainable Development Strategy?

Force Search:

The research assumes that:

- The adaptation of weaving techniques and aesthetics can be used to develop the metal lighting unit as a small productive project within the framework of the Sustainable Development Strategy 2030.

Research Objective:

- Benefiting from the structural and technical aesthetics of some textile structures using insulated metal wire material and adapting it in the development of the metal lighting unit as a small productive project in light of the sustainable development strategy 2030.

The importance of research:

- The possibility of adapting the techniques and aesthetics of some textile structures in the development of a metal lighting unit characterized by aesthetic and functional value.

- Enriching small productive projects as one of the main pillars and the cornerstone of the process of economic and social development and its importance.

- Spreading the culture of supporting small projects and self-employment for students studying in the field of metalworking in the faculties of specific education.

Search limits:

- The research is limited to the design and implementation of metal lighting units through the adaptation of the techniques of some simple textile structures (plains and cooler) simple.

- The application is limited to the use of insulated metal wire material (of different diameters and colors) on an iron structure designed for the lighting unit.

2. Research Methodology:

The research depends on the experimental approach using metal wire weaving techniques, and the descriptive analytical approach to describe and analyze the artwork in the research by addressing the following axes:

The first axis: some simple textile structures used in the implementation (gentlemen and cooler..).

The second axis: some concepts of plastic art for the aesthetics of weaving in the light of metal formation.

The third axis: a brief study on the nature of small productive projects, their importance, types and characteristics.

The fourth axis: selections from the metal lighting units implemented for the final stage students of the college .

Search terms:

Weaving

Known as the crown of the bride, "the weaver weaves the garment and weaves it into a weave, so the weaving if the warp is joined to the weft" (Muhammad Murtada al-Zubaidi, p. 237).

Procedural definition of weaving

Weaving in this research is meant as the process of intertwining each of the warp threads (longitudinal) with the weft threads (transverse) to form the textile workpiece using one of the textile structures.

Procedural definition of metal tissue

Metal weaving in this research is meant as the process of interlocking metal wires in the vertical direction (representing warp threads), and between metal wires in the horizontal direction (representing weft threads) to form the metal workpiece using simple textile compositions such as plain fabric and cooler ...

Lighting Unit

Defined by (Sherif Massad Aref, Abeer Mohamed Afifi) as "that luminous source whose designs vary in different bodies according to the space of the place to be lit, and at first used lanterns lit with candle and oil, then with the modern development and the emergence of electricity began to spread in the field of lighting electricity on the different bodies taking into account the quality of light issued by them (direct and indirect) (Sherif Massad Aref, Abeer Mohamed Afifi (2014)"

As defined by (Yahya Hammouda) as everything that is added to the light bulbs to overlay with him, whether as a simple reflector or lampshades, or globe, or chandelier attached to the ceiling, to achieve appropriate lighting, and must be available good appearance and attractive luster of the lighting device by which emanates vitality at night, as the lighting device contributes to a large share in the formation of spaces while not lighting during the day "(Yahya Hamouda (1984)

Small Projects

The International Labor Organization defined it as "those industries that employ less than ten workers (1-9) workers" (for the Central Agency for Public Mobilization and Statistics (2016)) , and the United Nations Industrial Development Organization defined it as that establishment that is managed by one owner and bears full responsibility, the number of workers ranges from (10-50) workers.

Sustainable Development:

Development that meets the needs of current generations without compromising the ability of future generations to meet their needs"

It is a comprehensive development strategy that seeks to provide the basic needs of human beings while preserving the environment and eradicating poverty, by achieving a balance between environmental, economic and social systems, and working with high transparency that guarantees the needs of the current and future generations.

The European Commission for Sustainable Development defines it in 1992 as "a policy and strategy that works to ensure sustainability and continuity in time, to achieve economic and social growth within the framework of respect for the environment, and without wasting natural resources placed in the service of human activity" (Abdo Mustafa (2008), p. 50).

Related studies

1. Study of "Baisa Abdullah Hamed Rahma" in (2017)

Study Title	Micro projects as an input for the production of contemporary lighting units using metal wires
Type of study	Published research – Scientific Journal of the Faculty of Specific Education – Menoufia University
Volume/Issue	(Part I) / Tenth
Objectives	- Training students to implement a micro project as an input for the production of contemporary lighting units using metal wires and marketing. - Revealing the relationship of student awareness of the principles of organizing and implementing modern micro-projects and the demand for the labor market.
Importance	- Enlightening practitioners of the field of metal formation of the importance of establishing micro-projects and creating new job opportunities that achieve a rewarding financial return for students after their graduation. - Undergraduate students can be trained and given skills that make them able to start a micro-productive project using prefabricated resources - Documenting and strengthening the links between the production of a contemporary lighting unit using metal wires and its marketing through microenterprises
Benefit points	- The use of insulated metal wire material in the production of contemporary lighting units
Points of difference	- The current research adopts one of the goals of the Sustainable Development Strategy 2030 (small productive projects)

	- The current research is limited to the use of some simple textile structures on a designed iron structure.

2. Study of "Mohamed Abdel Basset Mohamed Darwish" in (2024)

Study Title	Developing woodwork as small projects using wood turning techniques within the framework of the Sustainable Development Strategy 2030
Type of study	Published research – Journal of Architecture, Arts and Humanities
Volume/Issue	Ninth/Forty-third
Objectives	- Developing woodwork as small projects using wood turning techniques within the framework of the Sustainable Development Strategy 2030
Importance	- Employing woodwork and preparing students for the labor market. - Adopting one of the sustainable development trends in Egypt's Vision 2030 through woodwork.
Benefit points	- Identify different steps and entrances to visualize small projects.
Points of difference	- The current research adopts one of the objectives of the Sustainable Development Strategy 2030 through the field of metalworking.

3. Study of "Hind Khalaf Morsi Mohamed" in (2020)

Study Title	A proposed training program for the pioneers of the Coptic Museum as a starting point for rooting the cultural identity by establishing a small productive project in the field of metal formation
Type of study	Published research - Huth Journal in Art Education and Arts - Faculty of Art Education - Helwan University
Volume/Issue	-
Objectives	- Rooting the cultural identity of the visitors of the Coptic Museum to establish a small productive project through a proposed training program in the field of metal formation. - Contribute to the service of the external community and the development of humanity and the environment by training some of the pioneers of the museum to achieve an opportunity to increase the economic return for them. - Employing the field of metalworking through the proposed training program in solving the problem of unemployment in the light of rooting the cultural identity of some visitors to the Coptic Museum and helping them to establish a small productive project.
Importance	- Emphasizing the role of metalworking in serving and developing members of the outside community through the application of the proposed training program to train some of the pioneers of the Coptic Museum. - Rooting the cultural identity in the members of the external community (some visitors of the Coptic Museum) through their study of Coptic art with its symbols and expressive significance addressed by the Coptic artist according to the intellectual, philosophical and ideological beliefs that suit the era in which he lives. - The practice and experimentation by the pioneers of the Coptic Museum within the framework of the proposed training program in the field of metal formation provides an opportunity to open a fertile field for the work of a small productive project.
Benefit points	- Identify the nature of small projects and their characteristics.
Points of difference	- The current research used the material of insulated metal wires using some simple textile structures. - The current research has been hired to the metal lighting unit as a small production project.

The first axis: some simple textile structures used in the implementation (gentlemen and cooler..).

Among the textile structures that have been used in the practices of the current research are simple textile structures, including plain fabric and radiator... , for ease of implementation with insulated metal wires.

First: the fabric of the gentlemen

The fabric of gentlemen of the simplest types of textile structures that can be implemented and obtained where repeated interlocking tissue on the number of two wicks of warp with two wicks of the weft, as in the form (1) and illustrated some simple textile compositions gentlemen 1/1 implemented metal wire as in the form (2), (3).

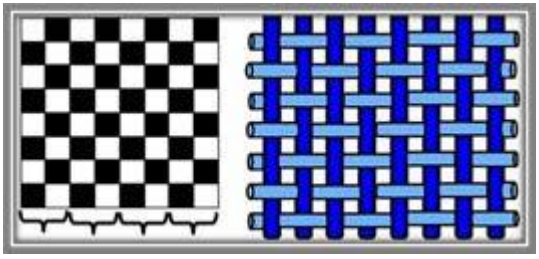


Figure (1) Simple Textile Structure (Gentlemen) 1/1

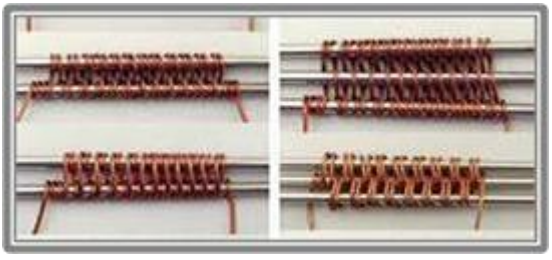


Figure (2) Some simple 1/1 textile structures are illustrated by metal wire

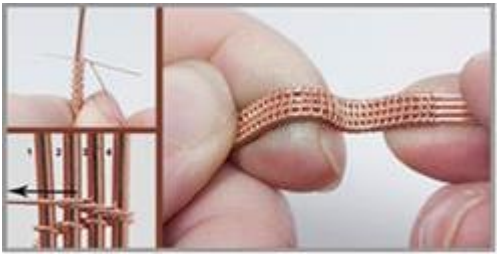


Figure (3) The plain textile structure is illustrated 1/1 with metal wire

Figure (4) shows the superficial appearance of the repetition of one of the repetitions of the plain fabric "and shows that the weft passes under the threads of the individual masters and above the marital threads, while the second weft passes vice versa and the threads of the dam intersect with the weft at right angles and if the weft extends in the plain fabric the width of the weaving from the right messenger to the left messenger, this is a normal thing, but if it does not extend the width of the fabric as a result of changing the color, this type of fabric is called Tabsperti or

Coptic
Or woven decoration or unextended weft texture.

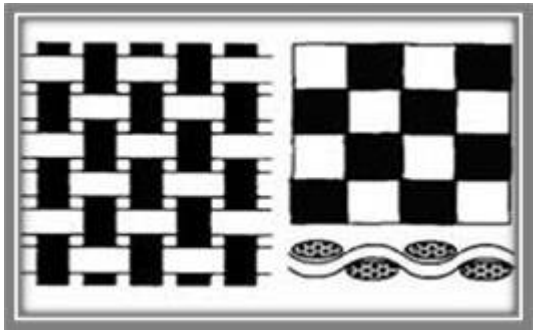


Figure (4) Simple Textile Structure (Gentlemen) 1/1

Figure (5) (A – B) Samples of the works of the artist (Mary le ho) based on the use of weaving technique using plain fabric with metal wire, and were among the pieces displayed in the exhibition at the Bellevue Museum of Art in Washington in 2012, quoting: https://www.ornamentmagazine.org/articles/mary-lee-hu-volume-444

Second: Refrigerated fabric :

The chilled fabric is the second type of tissue used and common after the compositions of gentlemen and is distinguished in its appearance from the plain fabric due to the way it is built and interlocking the threads of warp and weft, where the cooled fabric is generally characterized by the presence of the effects of oblique lines at different angles degrees and these effects are on the right or left or both together, and these effects are clear on the surface of the textile and the appearance of warp and weft varies as a result of the type of radiator used, Figure (6), and the installation of the radiator tissue is clear outlet by metal wire As in Figure (7).

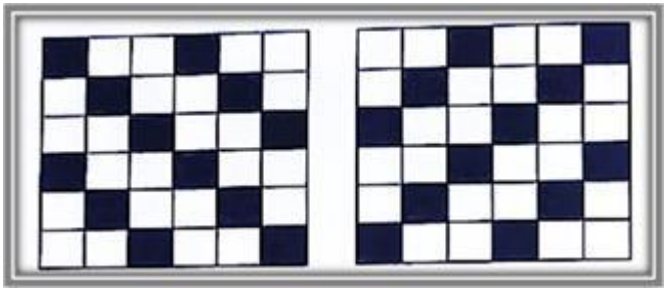


Figure (6) shows the effects of the cryogenic fabric on the right and left side

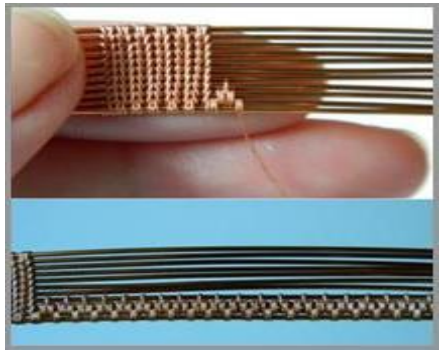


Figure (7) Illustrated textile structure cooled by metal wire

(a) (b)

Figure (8) (A-B) Samples of the works of the artist (Sally Craig) based on the use of weaving technique using metal wire-cooled fabric, quoting:

https://uk.pinterest.com/sallycr/jewelry-by-sally-craig-for-sec-design/

The second axis: some concepts of plastic art for the aesthetics of weaving in the light of metal formation.

Weaving and overlay concept

Weaving was associated with the concept of superposition, where it is a case of partial overlap cases, form (9), the overlay is intended in linguistically (the intermediate lexicon) installed the thing some of it sold a z oroverlap and defined by one of the researchers (Muhyiddin Tarabay) "that the disappearance of parts of the distant elements in the composition as a result of the presence of other elements in front of them, and the phenomenon of overlap may occur between two or more units, which is either partial overlap or seeAkba total (full)" (Mohieddin Tarabieh) (1977), p. 82), and from the above it is clear by the definition of (Tarabia) that the superposition has two types: total superposition, and partial superposition.

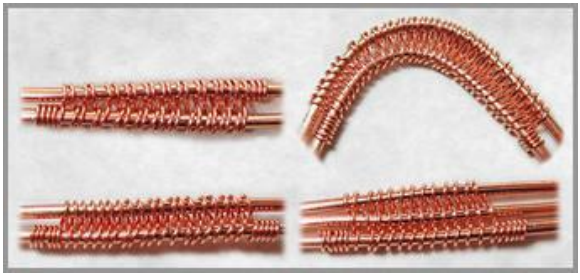


Figure (9) It is clear that the weaving is one of the cases of mutual partial superposition

He explained to us (Ihab Bismarck) the role of overlay in building and seeing the work of art, through his definition of superposition, where he defined it as a factor that increases our perception of unity and interdependence between the elements, and benefits from our awareness of the estimated movement of shapes, where it arises from a distinct movement that combines the movement of elements on the surface, and another clear movement in the direction of the estimated depth strengthens the sense of the presence of depth

Figure (10) The overlay is evident inside the artwork of the metal hanging of the artist (Hind Khalaf), red and yellow copper wires and pipes and precious stones

Figure (11) The overlay is evident inside the artwork, a lighting unit for the artist (Hind Khalaf), yellow and red copper, garnet and seashell

Some studies have tended towards linking the sense of overlay through the sense of touch or sight or both together as a study (Hind Khalaf), where he defined the overlap "as a case of total or partial disappearance of a morphological tick as a result of the occurrence of another formal single in front of her in the composition, whether in nature or artwork, which is perceived by the sense of touch or sight or both, which leads to strengthening the movement of that formal single on the surface and its movement in the direction of the estimated depth" (Hind Khalaf Morsi Mohamed (2004)..p. 22)

It thus confirms that there are two types of overlay (real superposition) that can be perceived by the sense of touch or sight or both, as well as (overlay illusionary) which can be perceived by the sense of sight only, and shared by both tissues and overlay in the possibility of perceiving and identifying them with the senses of touch or sight or both.

So we find that the concept of overlay and its application is strongly related to the concept of weaving, if the weaving is real as in Figure (12), where it is possible to touch the surfaces that make up the artwork and identify the type of texture and nature, the overlap is real, but if the weaving is delusional as in Figure (13), where the two-dimensional texture only transmits its effect after visually perceived through the eye, and then perceived by the mind, describes the visible surfaces as rough or Soft, prominent or sunken The superposition was delusional by extension, and it is possible to combine the real and delusional textile structures together as in Figure (14).

Figure (12) metal earring in which the real weave of the artist (Helen Murphy) is shown, metal wires, quoting from: https://jp.pinterest.com/helencmurphy/

Figure (13) A metal work in which the artist's illusion weaving is evident (Hamed Al-Sayed Muhammad Al-Bazara), brass

Figure (14) (A – B) metal work and a detailed body of it in which the real and imaginary textile overlays of the artist (Engy Saber Darwish) are shown, red copper

Weaving and the concept of intersection

Weaving is related to the concept of intersection, where one of the studies is described as a study (Hind Khalaf) that the intersection is one of the cases of partial superposition, whether mutual or non-m. Other, as defined (Muhyiddin Tarabieh) intersecting lines "that if a line meets while moving with another line at any point on it, without stopping in movement at the point of encounter, it is said that the first line has cut the second line, and this is called the intersection, and the place of their intersection is known as the point of intersection, and then the two lines become from the geometric point mtobey

From the above, we conclude that the intersection is closely related to the technique of weaving, if we look towards the intersection of the lines, we find that the weaving in its concept is a set of parallel vertical lines and represents the warp, intersecting with another group of horizontal lines transverse and represent the weft, and the intersection occurs when each line of these vertical lines meets with each line of horizontal lines as in Figure (15).

Figure (15) and a detailed part of it in which the relationship between the weaves and the intersection of lines and spaces by the artist (Sally Craig) is clarified, a necklace of gold and silver oxidized quoting:

https://sallycraigsecdesigns.com/bio/

Weaving, overlap and interweaving

There is a close relationship between weaving and the concept of overlap and entanglement, where he mentions to us (Hamid Mr. seed) in his definition that overlap and entanglement linguistically are synonymous words for onemeaning, which is the mixing or entry of things, some of which are Baa, and he explained that overlap and entanglement is a more comprehensive and broader concept than just the overlap of different surfaces on top of each other, but rather put him a set of possibilities that can be achieved, which is the overlap and entanglement between the plastic vocabulary used in one work as in Figure (16).

Figure (16) A metal work in which the real overlap and interweaving between the plastic vocabulary superimposed within the one artwork of the artist (Hamed Al-Sayed Al-Seed), red and yellow copper

From the above, it is clear that overlap and entanglement according to this definition is a concept directly related to the method of weaving, the weaving depends mainly on the idea of overlap and entanglement between the warp and weft threads through what is known as the textile structure, which results in the interweaving of those transverse threads with longitudinal threads direction in a state of entanglement in the lines and spaces with mesh compositions that depend on their cohesion and overlap on the network connection between their components

The third axis: a brief study on the nature of small productive projects, their importance, types and characteristics.

What are small projects?

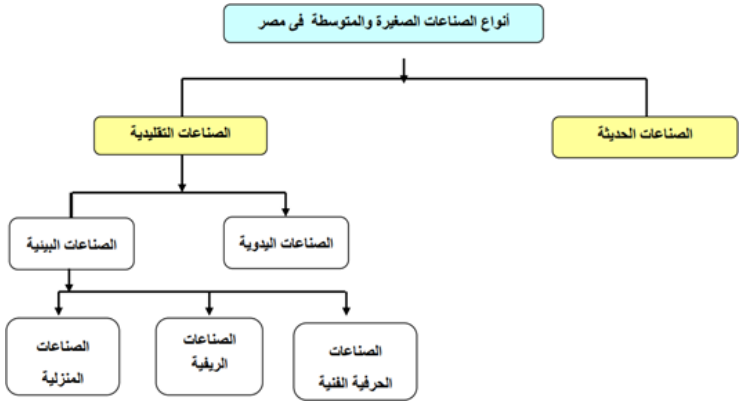
Although small projects play an important and vital role in the economies of many developed and developing countries alike, there is no specific or unified definition, but each country uses a definition that suits its circumstances, especially Egypt, where there is no specific and codified definition of small projects, and since the difference of countries in their definition of small industries is due to the different conditions of each country from the other in terms of the volume of economic activity, economic growth rate, and structure. Political, economic and social, there are several criteria that researchers tried to define small projects on the basis of which the most important of which are the size of the necessary capital, the size of labor, the quality of the technology used.

SmallProjects

Small and medium enterprises are considered the locomotive of the national economy because of their great importance and fundamental role for economic decision-makers, whether in developed or developing countries alike, as they are considered the cornerstone of the process of economic and social development, due to their positive return on the national economy, and their importance is largely embodied in their ability to create jobs at large rates and at a low capital cost, and thus contribute to the elimination of unemployment suffered by most countries, especially when Youth.

It also receives increasing attention from all countries of the world, especially developing societies, as it is not a modern inventor or modern innovation, but it has islands and historical background since ancient times until now, and small projects of any size or qualitative composition or geographical distribution represent a measure of resources, and they also reflect a degree of production capacity to meet the needs of the individual.

Types of small projects



Small industries are one of the most important elements on which the economic and social development strategy is based, as they contribute effectively to raising the competitiveness of the national economy and achieving regional development justice, and also play a major role in raising the competitiveness of large industries as a complement to them and exploiting all human and natural resources and providing goods and services at reasonable prices for low-income people. From this point of view, small industries can be divided through the following figure:

Characteristics of a small project

- Relying mainly on environmental and local raw materials.
- A small number of trained workers not more than fifteen people.
- Small capital
- The product is marketable.
- The product is characterized by simplicity and importance
- Lack of separation between ownership and management
- This product covers part of the needs of the local market and then export as a later step
- Profitability in a short time due to the small capital.

The fourth axis: selections from the metal lighting units implemented for the final stage students of the college.

Workshop No. (1)	
	
Type of workpiece	Lighting unit
Workpiece Dimensions	40 × 20 cm
Materials used	Steel structure, insulated wires Balornice (four colors)
Textile compositions used	Plain 1 / 1
Description and analysis of the workpiece The workpiece is a lighting unit taken as a cochlear open from above in a spiral, a package of metal wires insulated with varnish (hair wires) was used multi-colored and used in the implementation of the workpiece with one of the textile compositions (plain 1/1) as a single textile thread, so this gave diversity and richness of color to the shape, which achieved the aesthetic and artistic values of the workpiece, and a plant unit was formed in the form of a multi-petaled flower and was superimposed on the surface completely, which achieved balance between mass and emptying For the busy .	

Occupied No. (2))	
Type of workpiece	Lighting unit
	
Workpiece Dimensions	30 × 30 cm
Materials used	Iron structure installed on a wooden base with two floors, iron structure, insulated wires Balornis (three colors)
Textile structures	Plain 1/1
Description and analysis of the workpiece	

The workpiece is a lighting unit taken as a waterwheel open some parts of the top until the lighting is distributed, and the plain textile installation was used 1/1 to build the structure of the lighting unit through three colors of the insulated hair wires, and a group of plant units were formed in the form of flowers and decorated with parts of the surface of the workpiece, giving that diversity and richness of color and form, which achieved the aesthetic and artistic values of the workpiece.

Occupied No. (3))	
Type of workpiece 	Lighting unit (lampshades) 
Workpiece Dimensions	35 × 20 cm
Materials used	Iron structure installed on a circular wooden base, insulated wires Balornice (three colors)
Textile structures	Plain 1/1
Description and analysis of the workpiece The plastic construction of this workpiece depends on the formation of the upper structure of the lamp taken as a hemispherical body (adapted from the external shape of the mushrooms) using the plain textile composition 1/1 through three colors of the insulated wires and then treating the surface and decorating it with units of flowers formed by the insulated wire with a green balloon, which achieved color harmony between green, red and yellow, which achieved the cycle of aesthetic and artistic values of the workpiece.	

Occupied No. (4))	
Type of workpiece 	Lighting unit 
Workpiece Dimensions	Height 37 × diameter 23 cm
Materials used	Steel structure, wires insulated with Beyrenis (three colors)

Textile structures	Plain 1/1
Description and analysis of the workpiece The workpiece is a lighting unit taking the cylindrical form of the shape, relied in its construction on the use of plain textile composition 1/1 by choosing three colors of metal wires insulated with varnish of different diameters and the formation of a group of floral units and distributed systematically on the surface of the workpiece led to the diversity of contact between sunken and prominent, which enriched the surface of the workpiece and achieved aesthetic and artistic values, as evidenced by the balance between the mass and the space of the workpiece.	

Occupied No. (5))	
Type of workpiece 	Mobile lighting unit 
Workpiece Dimensions	Height 35 × 38 × 20 × 20 cm
Materials used	2 of the steel structure, insulated wires Balornice (three colors)
Textile structures	Plain 1/1
Description and analysis of the workpiece It is a lighting unit of two pieces of iron structures, the first is a rack structure installed by a zipper, and the second is an open cubic iron structure from the top and bottom to distribute the lighting installed in the first stand and movable, relied on the construction of the workpiece on the use of one of the simple textile structures plain 1/1, to process parts of the surface and distribute some plant elements formed to achieve balance between mass and space, and the use of more than two colors of insulated metal wire achieved diversity and color richness of the shape that Achieve aesthetic and artistic values for the workpiece.	

Occupied No. (6))	
Type of workpiece 	
Workpiece Dimensions	Lighting Unit (Lantern)

Materials used	Height 35 × diameter 20 cm
Textile structures	Iron structure installed on a wooden base, insulated wires Balornice (three colors)
Description and analysis of the workpiece This workpiece was formed in the form of a lantern, and the plastic construction relied on the textile composition of the masters 1/1 using three colors of the material of the insulated wire (hair) any very thin, and the use of wire with a larger diameter and wrapped on the iron structure of the lantern, which achieved the tactile diversity of the surface of the workpiece, and a group of plant units was formed using plain weaving 1/1 and another group using one of the types of crochet weaves and decorated by parts of the surface of the workpiece led to the diversity of contact between sunken and prominent, which led to the diversity of contact between sunken and prominent, which Enriched the surface of the workpiece and achieved aesthetic and artistic values, as evidenced by the balance between mass and space of the workpiece	Plain 1/1

Busy No. (7))	
Type of workpiece 	
Workpiece Dimensions	Lighting unit
Materials used	Height 30 × 20 × 40 cm
Textile structures	Steel structure, wire insulated with Beyrenees (three colors)
Description and analysis of the workpiece The workpiece is a lighting unit inspired by the shape of the ice car, the plastic construction of it relied on the use of textile composition 1/1 using three colors of insulated wire, where the use of various packages or groups of wires led to show diversity in textile compositions, which enriched the surface of the metal workpiece as the balance between the mass and the vacuum of the workpiece is evident.	Plain 1/1

Occupied No. (8))	
Type of workpiece 	
Workpiece Dimensions	Lighting unit
Materials used	Height 35 × Diameter 12 × 16 cm
Textile structures	Steel structure, wire insulated with Beyrenees (three colors)
Description and analysis of the workpiece The workpiece is a lighting unit whose bodies are adapted from the shape of the hourglass and formed using the textile composition 1/1, through three colors of insulated wires (red, yellow, green), and a larger wire was wrapped in diameter on the iron structure as a whole systematically, to achieve the tactile diversity of the surface with the woven parts, and a group of plant units were formed represented in the leaves and bending parts of them and distributing them to parts of the surface of the workpiece, and reflects to us the composition as a whole sensitive Unity, balance, spatial depth and renewed illusionary movement, as a result of the contrast resulting from tactile harmonies resulting from the weaving and bending of some parts of the plant unit superimposed on parts of the woven surface.	masters 1/1,

Occupied No. (9))	
Type of workpiece 	
Workpiece Dimensions	Lighting unit
Materials used	Height 37 × 8 × 6 cm

Textile structures	Steel structure, wire insulated with Beyrenees (three colors)
Description and analysis of the workpiece A lighting unit inspired by the shape of the telescope and its plastic construction relied on the use of plain textile composition 1/1 through three colors of the insulated wire, and the treatment of parts of the surface with some plant elements formed by weaving and spiral curve and distributed to parts of the surface, which led to the tactile diversity of the surface, to achieve balance between the mass and the space of the workpiece.	Plain 1/1

Occupied No. (10))	
	
Type of workpiece	Lighting unit
Workpiece Dimensions	Height 38 × diameter 20 cm
Materials used	Steel structure mounted on a metal base, insulated wires Balornice (four colors)
Textile structures	Plain 1/1, cooled 1/2
Description and analysis of the workpiece The workpiece is a lighting unit taken in the form of a flower pot, a package of metal wires insulated with varnish (hair wires) was used multi-colored and used in the implementation of the workpiece with one of the textile structures (plain 1/1, cooler 1/2) as one textile thread, so this gave diversity and richness of color to the shape, which achieved the aesthetic and artistic values of the workpiece, and two units were formed in the form of a multi-petal flower and were superimposed on parts of the surface completely superimposed which achieved balance between the mass and the void of the workpiece.	

Busy No. (11))	
Type of workpiece	Lighting unit

	
Workpiece Dimensions	Height 20 × Diameter 25 cm
Materials used	Steel structure, wire insulated with Beyrenis (five colors)
Textile structures	Chiller 1/2, plain 1/1
Description and analysis of the workpiece A lighting unit whose bodies take the form of a wheel, and its plastic construction relied on the use of the plain textile composition 1/1, the bar 1/2 through five colors of the insulated wire, which achieved the tactile diversity of the surface, and it is clear in the workpiece the balance between the woven parts and the space.	Chiller 1/2, plain 1/1

Occupied No. (12))	
Type of workpiece	Lighting unit
	
Workpiece Dimensions	Height 37 × diameter 23 cm
Materials used	Steel structure, wire insulated with Beyrenis (four colors)
Textile structures	Chiller 1/2, plain 2/2
Description and analysis of the workpiece A lighting unit whose bodies take the form of a lantern, and its plastic construction relied on the use of plain textile composition 2/2, Al-Mubar 1/2 through four colors of the insulated wire, and the form of some plant units and spiral lines and their distribution on the surface, which achieved the tactile diversity of the surface, and it is clear in the workpiece the balance between the woven parts and the space.	Chiller 1/2, plain 2/2

Occupied No. (13))	
Type of workpiece	Lighting unit (lantern)
	
Workpiece Dimensions	Height 27 × 15 cm
Materials used	Steel structure installed on a wooden base, insulated wires Balornice (four colors)
Textile structures	Plain 1/1, crochet
Description and analysis of the workpiece A lighting unit whose bodies take the form of a lantern, and its plastic construction relied on the use of plain textile composition 1/1, through four colors of the insulated wire of different diameters, which achieved color and tactile harmony of the surface, and it is clear in the workpiece the balance between the woven parts and the space.	Plain 1/1, crochet

Occupied No. (14))	
Type of workpiece	Lighting unit (lampshades)
	
Workpiece Dimensions	Height 27 × 33 × diameter 12 cm

Materials used	Steel structure, wires insulated with Beyrenis (three colors)
Textile structures	Plain 1/1, 2/1
Description and analysis of the workpiece A lighting unit inspired by its bodies from the shape of the lampshades, and its plastic construction relied on the use of plain textile composition 1/1, 2/1 through three colors of the insulated wire, and the treatment of parts of the surface with some plant elements formed by weaving and bending, and the spiral bending of parts of them, and distributed to parts of the surface, which led to the tactile diversity of the surface, to achieve balance between the mass and the space of the workpiece.	Plain 1/1, 2/1

Occupied No. (15))	
Type of workpiece 	Moving Candlestick 
Workpiece Dimensions	Height 27 × 23 cm
Materials used	2 of the iron structure, insulated wires Balornice (three colors)
Textile structures	Plain 1/1, 2/2
Description and analysis of the workpiece It is a lighting unit (candlestick) of two pieces of iron structures, the first is a carrier structure installed by a hung, and the second is a conical iron structure installed in the first holder and movable, relied on the construction of the workpiece on the use of some simple textile compositions plains 1/1, 2/2, to process parts of the surface and distribute some plant elements formed to achieve the aesthetic values of the surface, and the use of more than two colors of insulated metal wire achieved diversity and color richness of the shape that achieved aesthetic values And artistic for the busy .	Plain 1/1, 2/2

Occupied No. (16))	
	Lighting unit 
Type of workpiece	Height 37 ×25 × 25 cm
Workpiece Dimensions	Iron structure installed on the base of a cube, insulated wires Balornice (three colors)
Materials used	Plain 1/1, crochet
Textile structures	Plain 1/1, crochet

Worked No. (17))	
	Lighting Unit (Lantern) 
Type of workpiece	Height 40 × 20 cm
Workpiece Dimensions	Iron structure installed on a wooden base in the form of a pyramid, insulated wires Balornice (two colors)
Materials used	Plain 1/1
Textile structures	Plain 1/1

Occupied No. (18))	
	Lighting unit 
Type of workpiece	Height 36 × diameter 23 cm
Workpiece Dimensions	Steel structure, insulated wires Balornice (two colors)
Materials used	Plain 1/1
Textile structures	Plain 1/1

Worked No. (19)	
	
Type of workpiece	Lighting unit
Workpiece Dimensions	Height 25 × 22 cm
Materials used	Iron structure installed on a wooden base, insulated wires Balornice (three colors)
Textile structures	Plain 1/1
Description and analysis of the workpiece	

A lighting unit whose bodies take the form of an applice, and its plastic construction relied on the use of plain textile composition 1/1, through three colors of the insulated wire of different diameters, achieved color harmony, and formed a group of textile strips using different bundles of wire in addition to the formation of some plant units using plain fabric and crochet, which achieved the texture harmony of the surface, and it is clear in the workpiece the balance between the woven parts and the space between the textile strips.

Worked No. (20)	
Type of workpiece 	Lighting Unit (Candlestick) 
Workpiece Dimensions	Height 30 × 23 cm
Materials used	2 steel structures, insulated wires Balornis (2 colors)
Textile structures	Plain 1/1
	Plain 1/1

Worked No. (21)	
 Type of workpiece	Lighting unit 
Workpiece Dimensions	Height 22 × 12 cm
Materials used	Iron structure installed on a wooden base, insulated wires Balornice (two colors)
Textile structures	Plain 1/1
Description and analysis of the workpiece A lighting unit whose bodies take the form of a flower with closed petals, and its plastic construction relied on the use of plain textile composition 1/1, through two colors of the insulated wire of different diameters, and	Plain 1/1

the formation of plant units with weaving and distributed on parts of the woven surface, which achieved color and tactile harmony of the surface.	

Worked No. (22)	
	
Type of workpiece	Lighting unit
Workpiece Dimensions	Height 33 × 26 × 26 cm
Materials used	Steel structure, wires insulated with pyrenees (five colors)
Textile structures	Plain 1/1, cooled 1/2
Description and analysis of the workpiece A lighting unit whose bodies take the form of an open cube from the top and bottom to distribute the lighting, and its plastic construction relied on the use of plain textile composition 1/1, Al-Mubar 1/2 through five colors of the insulated wire, which achieved the tactile diversity of the surface, and it is clear in the workpiece the balance between the woven parts and the space.	

Busy No. (23)	
	
Type of workpiece	Lighting unit

Workpiece Dimensions	Height 42 × 40 × diameter 22 cm
Materials used	Steel structure, wires insulated with Beyrenis (three colors)
Textile structures	Plain 1/1
Description and analysis of the workpiece A lighting unit whose bodies take the form of a spacecraft, and its plastic construction relied on the use of plain textile composition 1/1, through three colors of the insulated wire of different diameters, achieved color harmony, and formed a group of textile strips using different bundles of wires in addition to the formation of some plant units using plain fabric, which achieved tactile harmony for some parts of the surface, and it is clear in the workpiece the balance between the woven parts and the space corresponding to the textile strips.	

Worked No. (24)	
	
Type of workpiece	Lighting unit
Workpiece Dimensions	Height 27 × 22 cm
Materials used	2 steel structures installed on a wooden base, wires insulated Balornis (two colors)
Textile structures	Plain 1/1
Description and analysis of the workpiece A lighting unit whose bodies take the form of a compound with two sails opposite to each other, and its plastic construction relied on the use of plain textile composition 1/1, through two degrees of red color for the insulated wire of different diameters, the small diameter formed by the inner triangle of the sail, and the large diameter is systematically wrapped on the outer frame of the triangle, which achieved tactile harmony of the surface, and it is clear in the workpiece the balance between the woven part represented in the inner triangle, and the space represented in the outer part between the small triangle and the triangle Big.	

3. Results

The results came in a set of points that answer the hypotheses of the research, and the results were as follows:

1. The development of metal lighting units through the use of some techniques of simple textile structures (plains and cooler) using the material of insulated metal wires of multiple colors and diameters.

2. The combination of some textile structures techniques and some metal techniques resulted in enriching the plastic formulations of the metal lighting unit and the diversity of surface treatments.

3. The experience can contribute to solving the problem of unemployment among young graduates.

4. It was possible to form and invest the material of metal wires insulated with varnish because of its several considerations, including not to be affected by water and air, which remains clean and luster, and the multiplicity of colors and the degree of high softness in the production of lighting units of different bodies characterized by aesthetic and functional values.

5. The research found the importance of spreading the culture of supporting small projects and self-employment for students studying the field of metalworking in the faculties of specific education.

6. Benefit from the adaptation of techniques and aesthetics of some textile structures in the development of a metal lighting unit characterized by aesthetic and functional value.

7. The results of the students' work indicate that there are signs of the growth of their skills in the production of metal lighting units developed as nuclei for small productive projects that can be marketed, based on the sustainable development strategy Egypt Vision 2030 as one of the goals of the economy axis, the sixth goal (providing decent and productive job opportunities).

4. Research recommendations

1. Maximizing the benefit of the sustainable development goals of Egypt's Vision 2030.

2. Adopting the sustainable development strategy - Egypt Vision 2030 through the field of metalworking.

3. Focusing on the importance of spreading the culture of supporting small projects and free manual work.

4. The need to continue innovation by linking the various fields of plastic arts, and encouraging the preparation of interdisciplinary research.

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WORKS CITED

Arabic References
1. Ibrahim Anis and others (1972): The Intermediate Dictionary, 2nd Edition, Part 1, Dar Al-Maaref, Cairo.

2. Central Agency for Public Mobilization and Statistics (2016): A study of the reality of small and medium enterprises in Egypt during the period (2009-2015), Publisher, Central Agency for Public Mobilization and Statistics Press, Arab Republic of Egypt.
3. Ihab Bismarck Saifi (1988): Aesthetic and structural foundations of design (the activities of formal elements), 2nd Edition, the Egyptian writer for printing and publishing, Cairo.
4. Raad Sami Abdel Razek Al-Tamimi (2008): Globalization and Sustainable Human Development in the Arab World, 1st Edition, Dar Degla, Amman.
5. Riyad Bin Jalili (2010): Competitiveness of Small and Medium Enterprises, Characteristics and Challenges, Edition 93, Development Bridge Series, Arab Planning Institute in Kuwait.
6. Sherif Massad Aref, Abeer Mohammed Afifi (2014): The Art of Forming Metals, Enamel and Glass, 1st Edition, Dar Al-Andalus for Publishing and Distribution, Hail, Saudi Arabia.
7. Abdel Rafi Kamel (1988): Introduction to textile technology and tapestry, Dar Al-Maaref, Cairo.
8. Abdel Moneim Sabry et al. (1975): Dictionary of textile industry terms, Arabic with definitions, English, French, German, Dar Al-Ahram for Publishing, Cairo.
9. Muhammad Murtada Al-Zubaidi: The Crown of the Bride from the Jewels of the Dictionary, Tah: A Group of Investigators, Arab Heritage Series, National Council for Culture, Arts and Letters, State of Kuwait, 1965: 2004, Article "NSC", Part 6, Tah: Hussein Nassar, 1st Edition, 1369 AH - 1969 AD.
10. Yehia Hammouda (1984): Lighting inside buildings, Dar Al-Maaref, Cairo.

Theses and scientific research

11. Beesa Abdullah Hamed Rahma (2017): Micro projects as an input for the production of contemporary lighting units using metal wires, published research - Scientific Journal of the Faculty of Specific Education, (Part One) / Issue X, Menoufia University.
12. Juma Hussein Abdel-Gawad (1997): Development of the tabletop loom to accommodate new combinations of terry techniques and decorative textile structures, unpublished doctoral thesis, Faculty of Art Education, Helwan University.
13. Hamed El-Sayed Al-Bazara (1996): Overlap and entanglement in metal formation, scientific exhibition view, Horus Hall, Faculty of Art Education, Helwan University.
14. Abdo Mustafa (2008): The impact of political corruption on sustainable development (the case of Algeria 1995-2006), Master's thesis in political science, Batna.
15. Mohieddin Tarabieh (1977): Linear values in drawing and painting the twentieth century, and the possibility of benefiting from them in the preparation of the art education teacher, unpublished master's thesis, Faculty of Art Education, Helwan University.
16. Mohamed Abdel Basit Mohamed Darwish (2024): Developing woodwork as small projects using wood turning techniques within the framework of the sustainable development strategy 2030, published research - Journal of Architecture, Arts and Humanities, Volume Nine / Issue Forty-Three, Cairo
17. Mona Gomaa Hussein (2015): Combining formation with melodies and weaving with wires and metal slides and employing them technically in building ornaments, unpublished master's thesis, Faculty of Art Education, Helwan University, Cairo .
18. Hind Khalaf Morsi Mohamed (2004): Plastic dimensions of the composition to develop a metal work, unpublished master's thesis, Faculty of Art Education, Helwan University.
19. (2020): A proposed training program for the pioneers of the Coptic Museum as a starting point for rooting the cultural identity by establishing a small productive project in the field of metal formation, published research - Research Journal in Art Education and Arts - Faculty of Art Education - Helwan University.

Foreign References

20. Alain Jounot (2004) : 100 questions pour comprendre et agir le development durable ,ed Afnor .

Internet

21. https://www.ornamentmagazine.org/articles/mary-lee-hu-volume-444
22. https://uk.pinterest.com/sallycr/jewelry-by-sally-craig-for-sec-design/
23. https://jp.pinterest.com/helencmurphy/
24. https://sallycraigsecdesigns.com/bio/