



Experimental Study of Using Formative Techniques for Expanded Metal Mesh to Develop the Creative Thinking in Ornaments Formation for Students of Art Education

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1. Explaining Expanded Metal Mesh

The metal mesh is composed of interlaced wires to form specific geometrical shapes vary according to their different thicknesses in mesh. It can be found in two different ways: one as a roll and another one in flat shape. Expanded metal meshes are widely used as steel reinforcement materials in petroleum, chemical industries and building. It is produced from solid sheets or plates of carbon, galvanized and stainless steel, as well as aluminum and a variety of alloys of copper, nickel, silver, titanium and other metals. Also recently other kinds of mesh can be found from plastic and Industrial fiber, [1]. To produce expanded metal; a sheet is simultaneously slit and stretched. This process expands the cuts into diamond shaped holes of uniform size. Because no metal is lost in the expanding process, expanded metal is cost effective and saves energy by conserving material and allowing the fabrication to go further and do more.

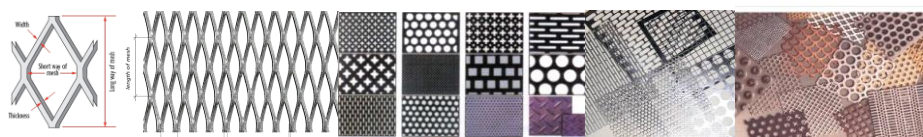


Fig.1.Group of Different Shapes for Expanded Metal Mesh

The specification of the expanded metal mesh is known by the Short Way Diamond "SWD", and also a measurement known as the Long Way of Diamond "LWD" with strand width and thickness. In fencing applications, the orientation of the diamonds creates different look to the final fence [2].

2. General Applications

Expanded metal is used in grates, outdoor furniture fencing, installation of "heating floor" system, plastering. [3] It is often used for guarding hot surfaces or machinery. Expanded metal is often used for architectural details and in security applications. Wire mesh is manufactured for variety of purposes: The original uses for fine mesh expanded metal were as sieves and filters. A multiple number of expanded metal sheets stacked offset to one another serves as the filter of an exhaust hood in the kitchen. Larger expanded metal mesh is primarily used in construction, and can be used as trash baskets or protective grates [1].

3. Artistic Applications

Wire mesh also finds many uses in the design field. It is very popular material in model making for representing steel and glass constructions in working models. When covered with papier-mâché or plaster fascia, such things as masks, sculptures or landscapes for dioramas can be created, [4]. Masses associated with the traditional proportions of the figure are exploited in ways that blend the sculpture into planes, enhancing the anatomical structure. Because of the open mesh they are able to explore the underlying tension of muscles and movement in relation to the implied mass of the figure. Created shadows by these sculptures appear in three dimensions, complementing the original structure of the art. In Fig.(2) Donald Kolberg created Abstract forms from steel mesh opening visual planes typically lost in the traditional sculpture, and creating movements along the surface and through the sculpture's mass. [5]



Fig.2. Abstract Forms

The applications of expanded metal mesh also can be used in art education field. We can use handmade methods to explore possibilities of artistic applications and to find new horizons for the innovative thinking of art education students. Three dimensional work pieces can be also made by expanded mesh to achieve functional and aesthetic sides. By expanded one metal sheet which can be cut into any wanted shape to make more things without losing its cohesion achieving the educational objectives [3]. Fig.(3)



Fig.3. Mini Fire Pit Piece; Made From Recycled Steel and Expanded Metal

4. Metal Mesh in Unique Modern Jewelry

Using mesh in jewelry design had doubt that the mesh would be scratchy or uncomfortable to wear, while the texture is soft and supple [4]. It is very easy to manipulate. It's perfect for creating leaves or wave effects. Menoni was one of the first to identify the potential for this material in fashion jewelry with predefined specification and colors .It is used in so many designs, in different ways to use wire mesh ribbons [6].



Fig.4. Group of Unique Modern Jewelry Using Expanded Metal Mesh

5. Some Of Metal Mesh Artists

5.1. Amy Jean Boebel's; intriguing mesh-metal sculptures:

Amy Jean Boebel's beautiful wire and mesh screen sculptures. Boebel who studied at the Art Institute of Chicago and Tulane University School of Architecture, Boebel creates high fashion, sculpture and assemblage. Her primary medium is aluminum screen. She has discovered that the interplay of light and surface adds surprise and even mystery to the work. She focuses more deeply on shape, movement, illumination, and shadows from the screen's ephemeral, non-utilitarian qualities. [7]



Fig.5.Boebel Sculpted Of Aluminum Wire Screen

5.2. Michael Turner; Creatures Project Artist

Michael is best known for his experimentation with metal and welding techniques and is famous for his sculptures using stainless steel. The reflection off the stainless steel gives the effect of shimmering color which really is effective on a creature sculpture like the dragonfly. One of the most striking parts of his sculptures is the dragonfly wings and how he has created metal mesh to give transparent effect through the holes in the metal [8]. Also A Mosquito metal sculpture made from old flat iron hammered roundly for the legs as piece of old pipe, some rusty expanded metal screen, Fig.(6).



Fig.6.Dragonfly and Mosquito Metal Sculpture

5.3 Alberto Luzzi's Metal Mesh Collection

Italian jewelry designer Alberto Luzzi proves he is a master of style with his distinctively original metal mesh collection. His wearable pieces of art are set in sterling silver and plated in rhodium or gold. He has created a fabulous line of chic sterling-silver jewelry, Luzzi founded his label "Adami & Martucci" in 2007. What really sets this innovative collection apart is its versatility. Many of the necklaces can be worn in three to four different ways. His mesh collection is chic and captures a classy elegance at the same time [9].



Fig.7.Luzzi Earrings

6. The Practice Part of the Research

Throughout the previous description and as the expanded metal mesh is developed as metal material that has role in the formation of unique and beautiful shapes, so the researcher made workshop titled (Think...Design... Implement). It represented the applied practice to use the expanded metal mesh as a new material for ornament forming experiment on selected group of art education students in Alexandria University to apply the metal formation techniques merging them with using the expanded mesh as new material in the art education field. Making creative metal ornaments opens new fields in the art education which can contribute in the development of innovative part of the students ensuring creativity to find new visions of metal ornaments helps the art education field.



7. Procedure of the Applied Practice

7.1. Introducing the Material and Its Used Techniques for Formation

In the workshop, the material is displayed in its different types describing the different formation styles then the techniques can be used without losing the unity of the ornament piece. The following photos show the researcher during her explanation for the set of techniques used in metals describing the formation possibilities Fig. (8).



Fig.8.Describing Formation Possibilities

7.2. The Preparation of Suitable Ornaments Design According to the Nature of the Material

The design starts to allow executing the work with different formation methods according to the material nature which had been described earlier. Putting into consideration imagining how to utilize these techniques with the expanded metal mesh as new material for experiments of using them in performing the designs. The following few photos show students during the design stage. Fig. (9).

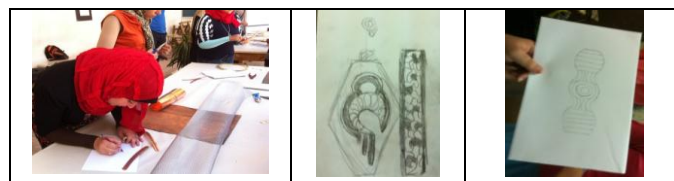


Fig.9.Design Stage

7.3. The Execution Stage and Optimizing Between the Metal Forming Techniques with Expanded Mesh Using Possibilities

Starting with using formation techniques on the expanded metal mesh such as using wire and drilling by acid on metal surface to get different effects with using expanded mesh from removing and unloading some parts with bending and cutting. Fig. (10).

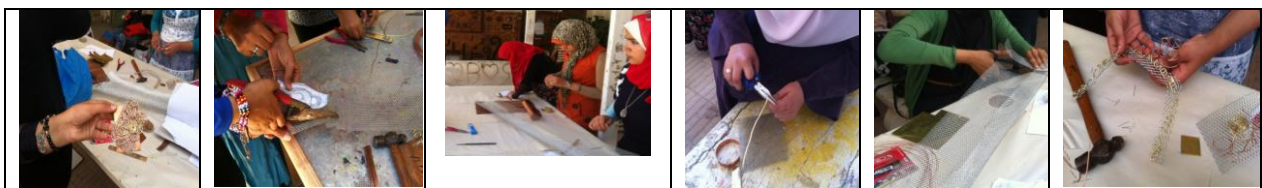


Fig.10.Execution Stage

7.4. Providing Directions and Solving the Creativity Problems to Develop the Sense of Innovation

During the execution of work piece, some technical problems appeared related to the distribution of the different techniques in the selected design. Those problems can face the students during their working as obstacles need to be solved in every case individually. In some cases it should be solved with creative ideas to complete the work piece by combining more than one technique in the same piece in order to develop the creative and innovative thinking of students. Fig. (11).



Fig.11.Stage of Directing and Solving the Creativity Problems

7.5. The Finishing and Finalizing the Work Piece

Then the final stage came in executing the metal work pieces for their finishing process in a free work environment to release creativity of students motivating them for more learning with self confidence. The finishing process of each piece depends on its design, also it depends on the student's individual thinking and his creativity to finish his artistic piece and how to find solutions for creativity problems those face the students in the finishing process from oxidation, burnishing and setup of some parts Fig. (12).

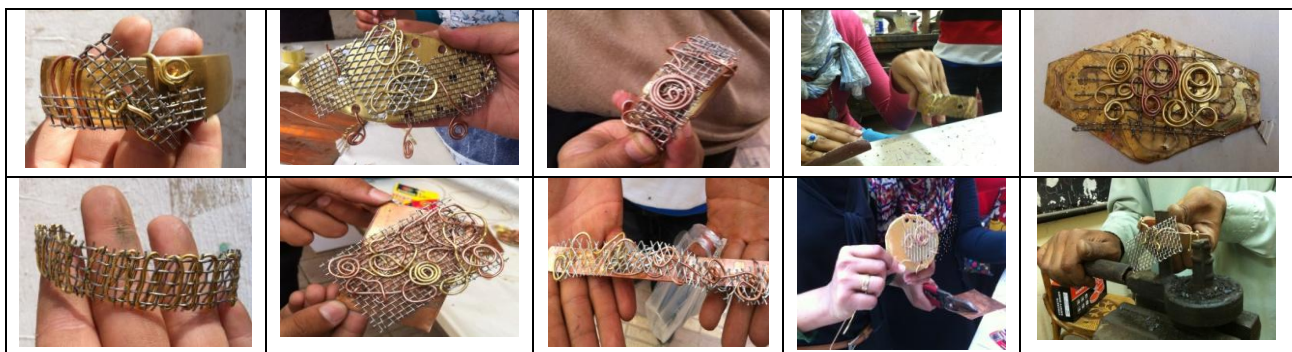


Fig.12.Finishing Stage

7.6. Showing Experiment's Results



Fig.13.Workgroup Team



7.6.1. Bracelets Set



Fig.14.Set of Bracelets Made By Students

7.6.2. Necklaces Set



Fig.15.Set of Necklaces Made By Students

7.7. Results Analysis

The results have shown the effectiveness of using the formation techniques on the expanded mesh to develop the creative thinking for the students of art education. The workshop received great acceptance resulted in positive interaction from students to the applied practice to execute the artistic work pieces in the jewelry field. That opened wide various horizons for innovations from using the expanded mesh as a material with variety in using to make necklaces and bracelets, etc. Also the uniform units of the expanded mesh allow making different rhythm in the design to exit from the repetition zone to the surprise element in the design then to another round or spiral element. The results confirmed the sovereignty of the unity in the design to give every pieces unique style of creativity. So it has the important and effectiveness role to enrich the educational and creative side in the art education students.

The results and the innovative arts those were created by the students have included the following points:

7.7.1. Combining of many techniques for metals such as drilling, hammering, punching...etc and techniques of expanded mesh to combine the spontaneous and the regularity.

7.7.2. Removing some of mesh units and use unloading in more than one art piece to achieve transparency and to bring about contrast between the tight and wide areas in the work piece to enrich its artistic values.

7.7.3. Using the formation techniques of galvanized copper wires to make round shapes giving harmony between the geometrical squares of mesh with the circle in geometrical artistic relationship.

7.7.4. Using the metallic chains as a part of piece design rhythm.

7.7.5. Uniqueness in the design to ensure the functional and aesthetic sides in using the expanded mesh material that gives new artistic visions in the innovation of work piece.

Reference

- [1] modulor.de/en/Metal/Expanded-Metal/
- [2] Guilford, J. P.(1950). Creativity. American Psychologis.
- [3] Presseisen,B.(Ed.)(1999).Teaching for intelligence.Illinois: Skylight Professional Development Press.
- [4] Philip Morton, Contemporary Jewelry, New York, 1970.
- [5] donaldkolberg.com/index.htm.
- [6] Turner,Rulph 1976 : Contemporary jewelry , casselsand coller Macmillan publishers 1td ,New York.
- [7] amyjeanboebel.com/home.html.
- [8] michaelturnerstudios.co.uk.
- [9] adamimartucci.com/portfolio/item/mesh/.