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Creative visions of modern technology within the framework of the educational process service in the of faculties of Fine Arts "Cooperative learning and interior design"

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Abstract

Dr. Taher Saad confirms that the ability to innovate is one of the most important mental capacities which human is characterized than other creatures, with this capacity, human built its civilization in both material and intellectual [1]. It attracted the psychology researches in the mid. Twentieth century as it was a subject of philosophy topics before. As a proof is this steady increase in number of this kind of researches and its innovations [2]. On the Arabic level, there was (the second conference of talent and creativity) in the Jordanian capital Amman in the year 2002. From the most important recommendations of this conference was the curriculum and teaching methods. That's why there were a lot of thinking programs which are spread all over the world to teach different skills as The Cort Thinking program [3], Hamilton Program, Torrance program for the four skills, Talents Unlimited Program and CPS creative thinking program and technology [4]. Hence the research aims to develop the basics of innovative thinking at the Fine Arts faculties, at the head of the educational tasks to suit with the nature of these colleges, and the researcher has taken from the thought of cooperative learning and advanced technology as a means to show the innovative student his creative thinking, this process fusion produces a new generation of students able to be creative to match with the labor market.

Keywords: *creative thinking, innovation, interior design, instructional design, cooperative learning, technology of Interior design.*

1- Thinking design is innovating thinking

Design thinking refers to design-specific cognitive activities that designers apply during the process of designing [5] .The notion of design as a "way of thinking" in the sciences can be traced to Herbert A. Simon's 1969 book The Sciences of the Artificial [6], and in design engineering to Robert Mc Kim's 1973 book Experiences in Visual Thinking, and Richard Buchanan's 1992 article "Wicked Problems in Design Thinking" . In 1972 psychologist, architect and design researcher Bryan Lawson conducted an empirical study to investigate the difference between problem-focused solvers and solution-focused solvers, and therefore Nigel Cross concluded that Lawson's studies suggested that scientist's problem solve by analysis, while designers problem solve by synthesis. Kelley and Brown argue that design thinking uses both analysis and synthesis [7]

1-1- Creative problem-solving technique categories

Many of the techniques and tools for creating an effective solution to a problem are described in creativity techniques and problem solving.

Creative problem-solving techniques can be categorized as follows:

- **Mental state shift**: Creativity techniques designed to shift a person's mental state into one that fosters creativity. These techniques are described in creativity techniques. One such popular technique is to take a break and relax or sleep after intensively trying to think of a solution.

- **Problem reframing**: Creativity techniques designed to reframe the problem. For example, reconsidering one's goals by asking "What am I really trying to accomplish?" can lead to useful insights.

- **Multiple idea facilitation**: Creativity techniques designed to increase the quantity of fresh ideas. This approach is based on the belief that a larger number of ideas increase the chances that one of them has value. Some of these techniques involve randomly selecting an idea (such as choosing a word from a list), thinking about similarities with the undesired situation, and hopefully inspiring a related idea that leads to a solution. Such techniques are described in creativity techniques.

- **Inducing change of perspective**: Creative-problem-solving techniques designed to efficiently lead to a fresh perspective that causes a solution to become obvious. This category is especially useful for solving especially challenging problems.[2] Some of these techniques involve identifying independent dimensions that differentiate (or separate) closely associated concepts.[8] Such techniques can overcome the mind's instinctive tendency to use "oversimplified associative thinking" in which two related concepts are so closely associated that their differences, and independence from one another, are overlooked.[9]

1-2- Creative solution to problems and software tool

"**T**herese", which is also Known as creative problem solving theory (IIPS), was established by "Genritsch Altschuler" and his colleagues based on more than 200000 patent examination. This method is designed to promote the establishment and development of the ability to obtain patent inventions, but also useful for creating non- productive solutions. Drawing mind maps are creative styles, which redefined v both the situation and the creativity. Brainstorming, is a group activity design to increase the amount of new ideas[10] and get connected to people , who can help in increasing knowledge and understanding problems." Edward de Bono" has published as lots of books. Which solved creative problems and innovative thinking which is called "Besides thinking ".

The process of creative problem solving (CPS). Is a six step method created by " Osborn Alex " and Mr. Barrens, who alternates between phases of convergent and divergent thinking:

- The familiar method to teach creating solution to problems is to teach "critical thinking", as well as creative thinking but it didn't prove the effectiveness of this method.

- As an alternative to the separation of creative and critical thinking, problem – solving some creative focus on either reducing the disadvantages of the idea or extract important idea defective advantages and integrate these features in different idea.

Tools for creative solution problems: consist of programs or targets for manipulation (such as cards) which facetiae specific techniques [11] to solve creative problems. "Electronic meeting systems "offer a range of interactive tools to solve problems by creative collections on line [12][**Figure. 1]**.

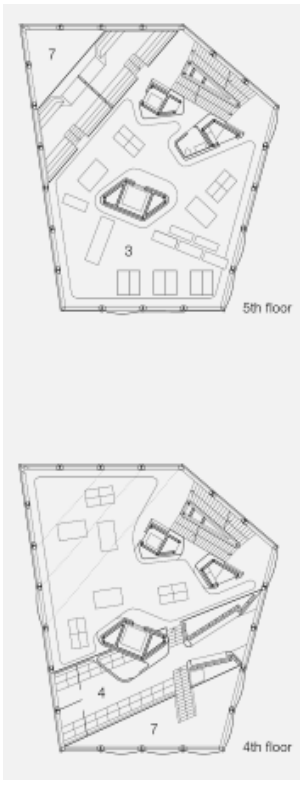
Figure.1: This restaurant is located in the city of Taichung ,this is one of the ways of innovative thinking to the process of design using recycled cardboard, everything in it from the furniture, plates Accessories, and dishes and chairs is made of this paper if broken any piece of restaurant furniture can be re-simply recycled[12].

Figure.2**: Material technology and new thinking of interior design** [13].

Plastic shapes flowing spatial sequence variety of high -quality surface

Figure.3: **Renovation of heritage-listed trance house spatial dynamics and colorful area Applications of cross- laminated timber panels** [13]

Film and visual Media research centre in London- Architects: surface Architects – London



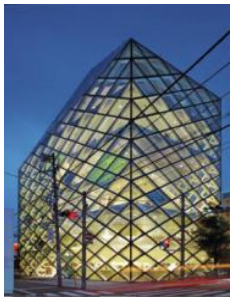


Figure.4: **Technological developments of architecture and its impact on the creation of a new form of internal space**.

Prismatic form of (Prada flagship store in Tokyo) [14]

2- Creative thinking and technology Interior design

Over the past decade, technology has influenced many fields of design in the past decade. Design in the Digital Age addresses contemporary architectural practice in which digital technologies are radically changing how buildings are conceived, designed and produced [15] .Some of the changes I've encountered in interior design are the programs we use -, 2DCAD, Sketch Up, Rivet, Rhino, 3D Studio Max, V-Ray, Mental Ray – you name it. The influence of computer technology on interior design over the past years has been immense. From communication to new product offerings, a completely new world of possibilities has opened within interior design in the last 35 years, changing the very process of how we design and adding unprecedented range, speed and quality to the design and renderings that we can now present to our clients[16].

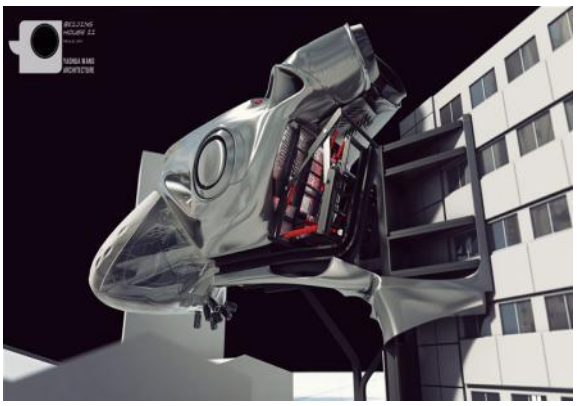
The famous Brazilian designer Haeberli once said: "Interior design is what I see when I close my eyes". This is what other designer believes in. One thing I do know is: "interior design is in our mind", may be in the future the technology will allow us to link the final result directly to our minds, but until then, we have to keep on sketching and relying on the progressed technologies to continue to develop our design. Zhuo Da Chinese Company has been able to accomplish it through a three dimensional printer [Figure. 5].

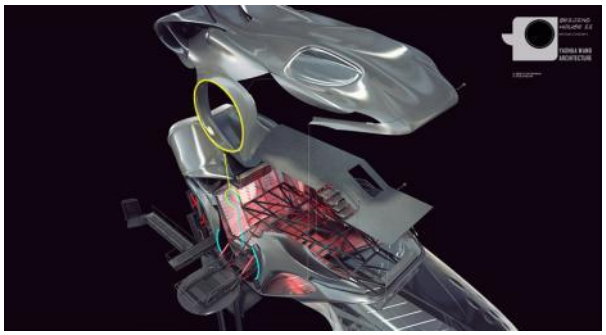
Figure.5: real two storey villa:

Villa by using the 3- dimensioned printing technology. Then the Chinese company Zhuo Da installed it in 3 hours, the villa has been printed on co parts in the company's factories, then they shipped the parts and collect them at the construction site. The company didn't reveal for building! but said that these materials are characterized as being against water and fire, and that the building bears the earth quake measuring g degrees because each unit weigh more than 100 kg / m^2 14].three dimensional printing is the production of a true solid models of the process of three dimensional using digital designs and three- dimensional printer. This process also is known. As "additive manufacturing" Or "collective class production", as they are getting the product by adding several layers of materials to each other. This is a reverse process which is known as " subtractive manufacturing " ., where the product is obtained through sculpture, cutting chipping and templates work in this way for a lot of resources used in production.

***Figure**.5: The most famous of these* technologies are selective laser sintering (SLS), fused deposition modeling (FDM) and depend on the melting of metals (steel – silver – titanium) and (SLA) stereolithograhp depends on processing images by using laser and UV interactive [17].

The concept "function in design" has a new meaning. There is no doubt that there are many electronic equipment necessary for carrying out on interactive interior design such as : sensors – connectors – mechanical actuators and others, which affect the way of carrying out the design as well as the final form in some cases[18][**Figure**.6,7,8].





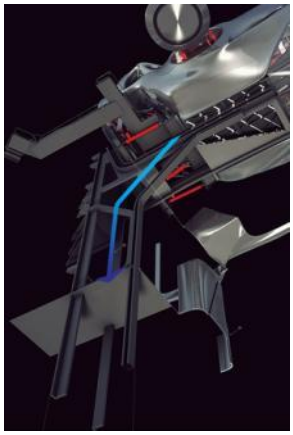


Figure.6: Strengthen the building with mechanical arm counteracting the effect of earthquakes when they occur.

Figure.7: house design will be built in Beijing on an area of 500 m^2 of design "Aauaha Walng" architect's office. In the enormous industrial revolution it appeared in Beijing the "exploit of space" direction, but with the increase in population, disappeared those spaces., which led the designer to use house and factories that already exist as bases to install hanging homes with robotic arm that holds the house., so it can move to change the scene which the dwellers of the house see. The idea is controversial and could have many negative aspects., but we are offering creative thinking with all its advantages and disadvantages as it could be a source of inspiration to someone else who can come up to more practical ideas[19].

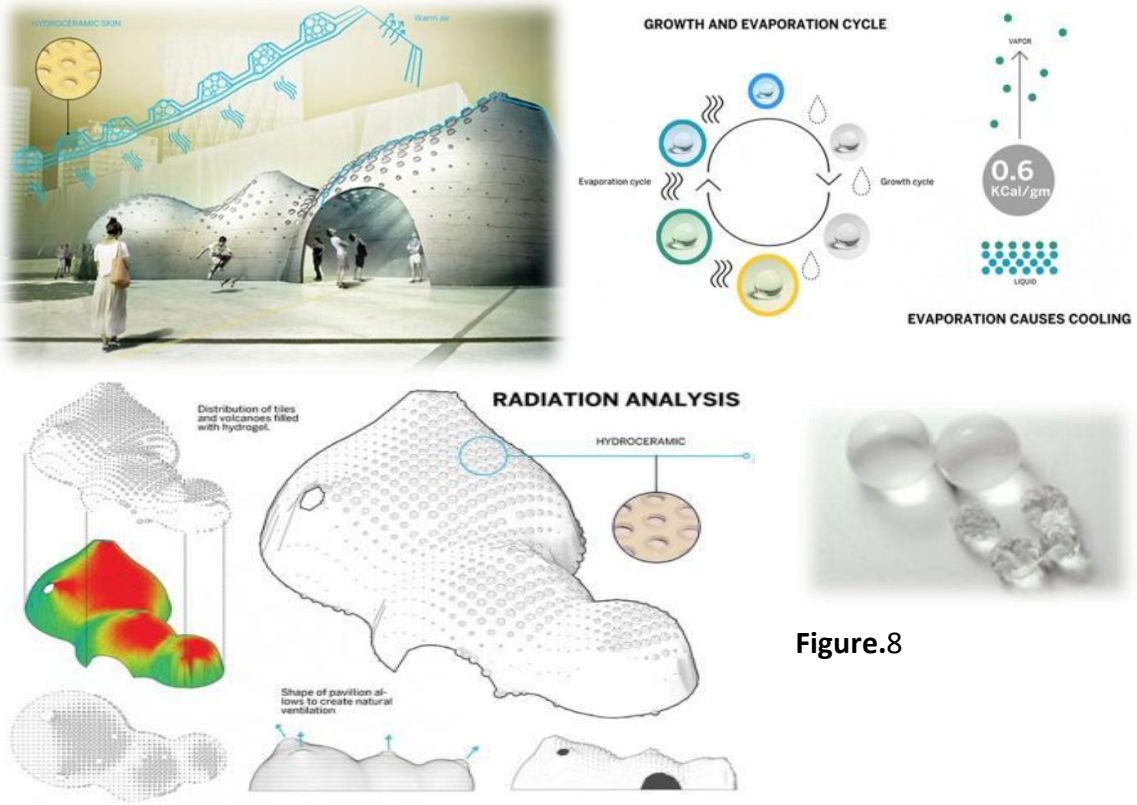


Figure.8

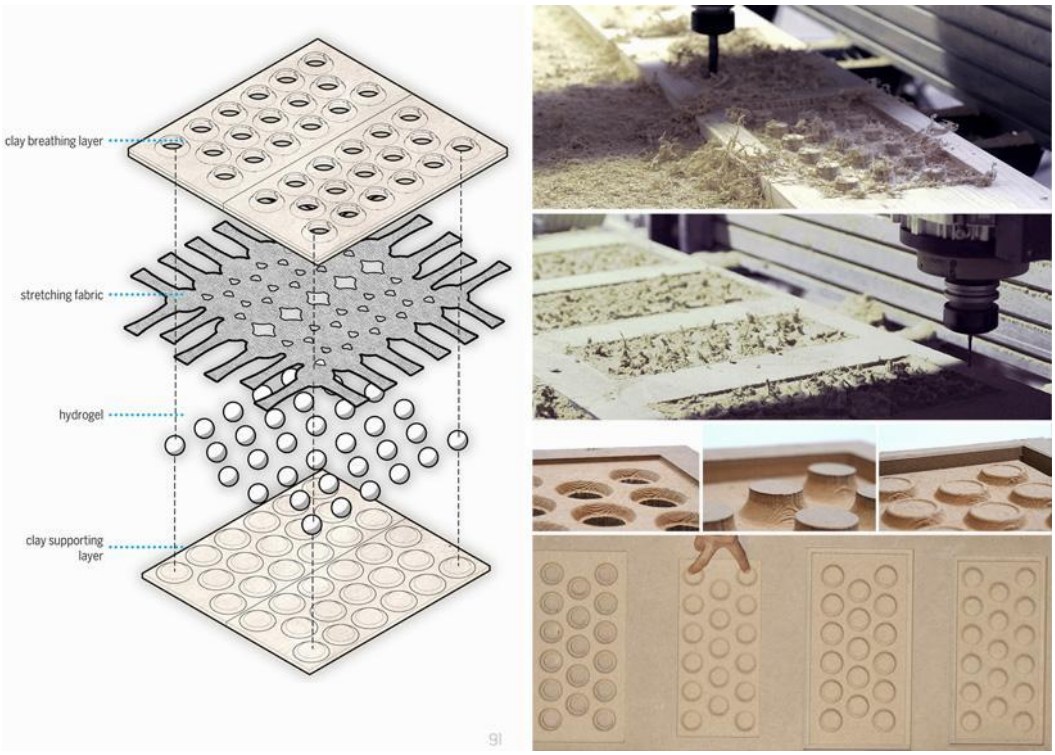


Figure.8: Experts found a method of building walls to absorb moisture from it and to transform it sweat. (Works. Like sweat skin in human body). To cool the internal area of the room. The reason for choosing is due to its ability to stretch up to 500 times its normal size to absorb water. Also considering that small Hydro gel bubbles suit different forms of walls. (The installation of bubbles of material between the 2 layers of ceramic hydro gel is what allows this technology to be used in walls) . When the room temperature increases, the absorbed water will evaporate to cool the air in the absorbed water. Evaporate to cool the air in the room between 5° to 6° c. This is regarded as a kind of artificial intelligence, where it begins cooling the internal area as soon as the temperature increases. At the same time if the evaporation process didn't occur, the cooling process will not be done too [20].

3- Instructional design and its role in enriching the creative thinking of the student

Teaching is a human process which aims to achieve the planned targets, but the teaching design verses engineering. Where there is planning and implementation. To achieve instructional results [21] . As elisions which are built on accuracy evaluator and creative in work will be saved in memory. This effort will need a complete group which participates with each other in the instructional process [22]. The instructional design is related to the field of cognitive science and behavioral psychology and constructive theories (learning theory). Design process consists of determining the current status for the student and its needs, and then setting goals, then planning and designing steps that must be followed to reach the progress of the design, it must be derived from the design steps of (pedagogy science). Education science (for

Ondragoggio) adult learning, which proved. Its effectiveness the results of can be known and measurable. There are many instruction design models but most of them are based on the five-stage model (analyzed, designed, developed, implemented, values) [23] . **Hence**, the researcher chose "the cooperative learning "as a research in a trait for an innovation of thinking to the student during the design process. This is with the help of technology as a catalytic element to him through the application of collective learning theories.

4- Cooperative learning between creative thinking and technology Interior design ((Applied Study: students of the Faculty of Fine Arts of Alexandria University - Decoration department)

Cooperative learning is an instructional strategy that simultaneously addresses academic and social skill learning by students. It is a well-researched instructional strategy and has been reported to be highly successful in the classroom [24].

4-1- Elements of Effective Groups

Full participation - All team members contribute their time and energy to the project. More importantly, all team members participate in the decision making process [25]. Trust - Members trust that each member will add value to the project, and members work to ensure that everybody contributes and that appreciation is expressed for different contributions. Open communication - Communication is the glue that holds a team together. Communication is effective when all members [26].

4-2- Contribute ideas

- Provide feedback constructively.
- Ask for clarification on anything that might be confusing.
- Provide frequent updates.
- Listen to each other carefully [27].

4-3- Work style In Applied case

Jkso researcher method chosen (installation groups, and this is the way of destruction used by Ornson (1978), known as Arsonson Jigasaw, a method of learning a collective request each member of the group learn certain part of the subject, and then teach him to his colleagues[28].

The installation method focuses on student activity in two windows: the parent group and specialization, the class is divided into groups in each group of 5-6 students, and, in the mother teams(**Professor: researcher** "**Fayza Eldlaal"**) each student is trying to specialize in a specific task to convey information to members of the teams reached by the band which Specialization They discussed the same task, and this stage is called the stage of education student-students so that each student is the teacher's role, members of the class tries to install

these sections are resulting in overall shape of the material is like a game of installation and the mark that takes the student is a personal mark and not the group mark[29].

4-4 -Stages of collaborative work

1- **Identify grade:**

Which is to understand the problem or task at hand (it was the application of digital technology in the manufacturing **"Digital fabrication** " of graduate students "diploma," and the use of laser and **Hologram** technology in the interior design of the second year students in the Decoration department) and determining legibility, allocated to the implementation and time.

2- **The crystal grade:**

And where is the agreement on the distribution of roles and how to cooperate and identify collective responsibilities and shared decision-making, and to respond to the views of the group and problem solving skills.

3- **The production grade:**

Where we are at this stage to engage in work by members of the group and cooperation required by the principles and standards agreed upon completion.

4- **View the results of collaborative work and discussion**:

Each group suffered as a result of the findings by the coordinator, and the teacher listens attentively to each group, and writes the most basic elements that reached by the student during the practical task[30].

5- **Evaluation**:

Evaluation of collaborative work and estimated the degree of cooperation between members of the group, and the validity of their findings of Information [31].

4-5-Digital fabrication and teaching interior design for students of post-graduate "Diploma-Decoration department"

Case study.1: shows the steps followed by the students in the presence of the thought of innovating during the design process for a residential spaces through the basic idea of the work is inspired by nature and then use CAD program to be implemented and then use the CAM program and finally the use of MAX program to illustrate interiors design in three-dimensional form.

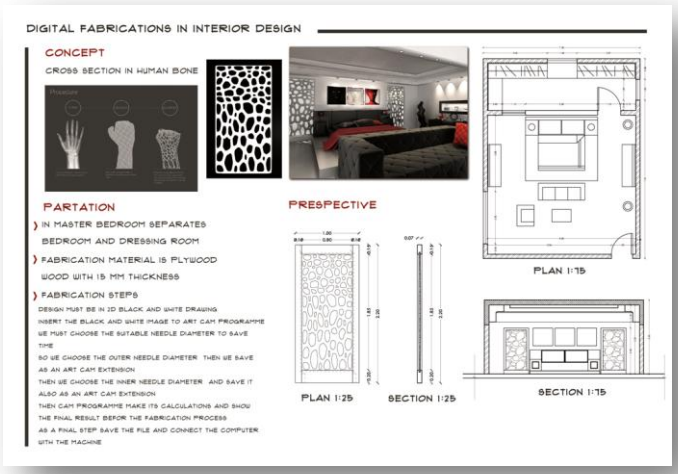


Figure.9, a: **Case study.1**

Academic project by:

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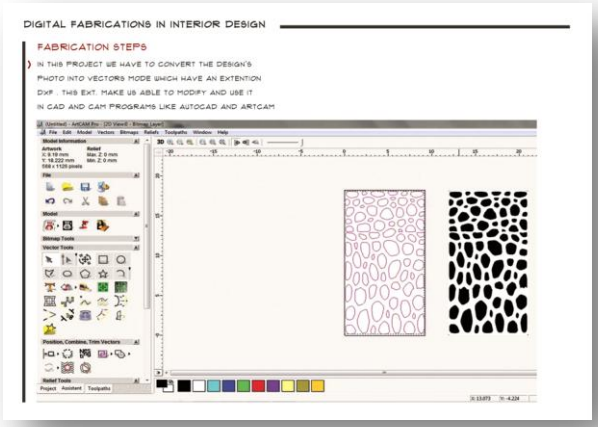
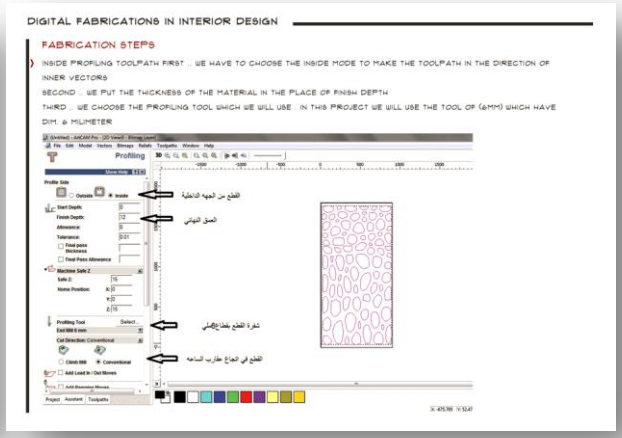
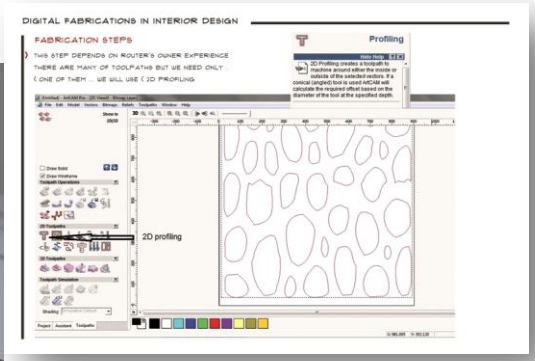
Design of Partition







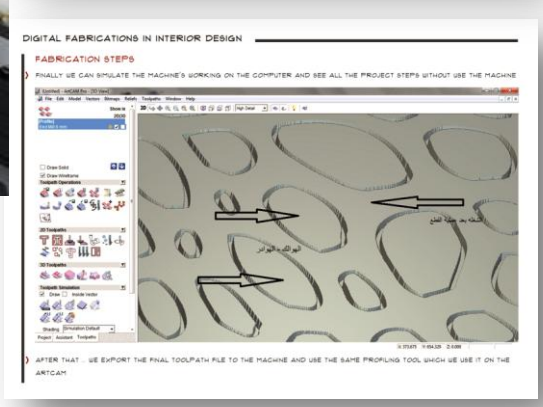


Figure.9, b

Design of Chair B-

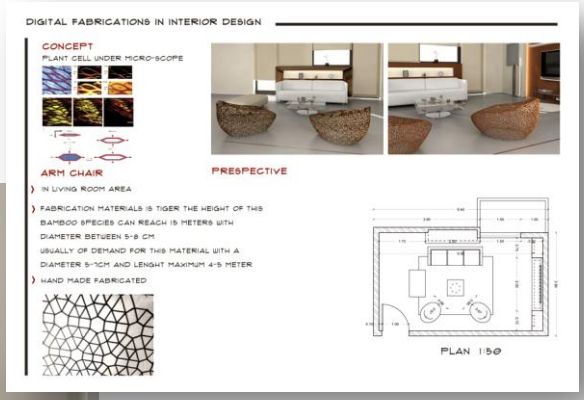


Figure.10

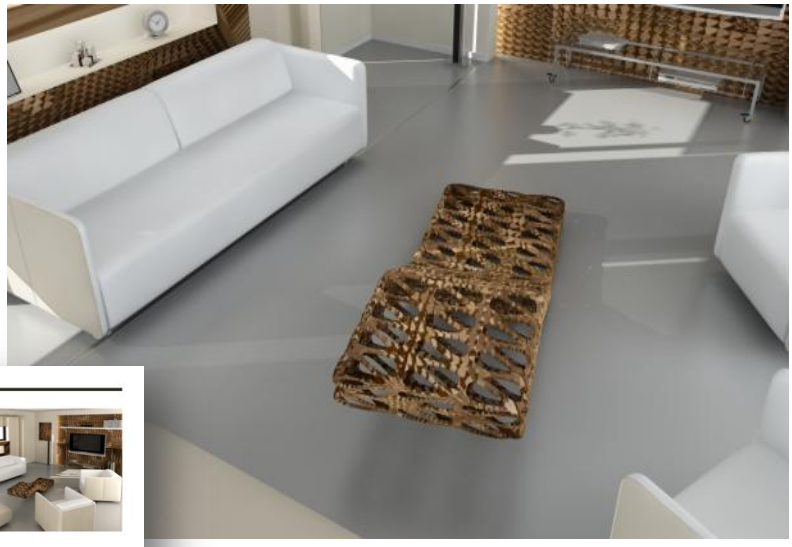
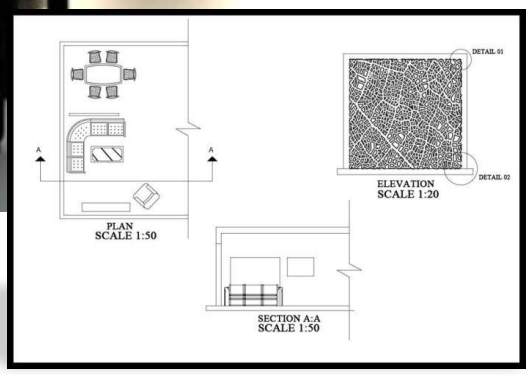


Figure.11

Design of table C-

Figure.12, a



Design of Partition

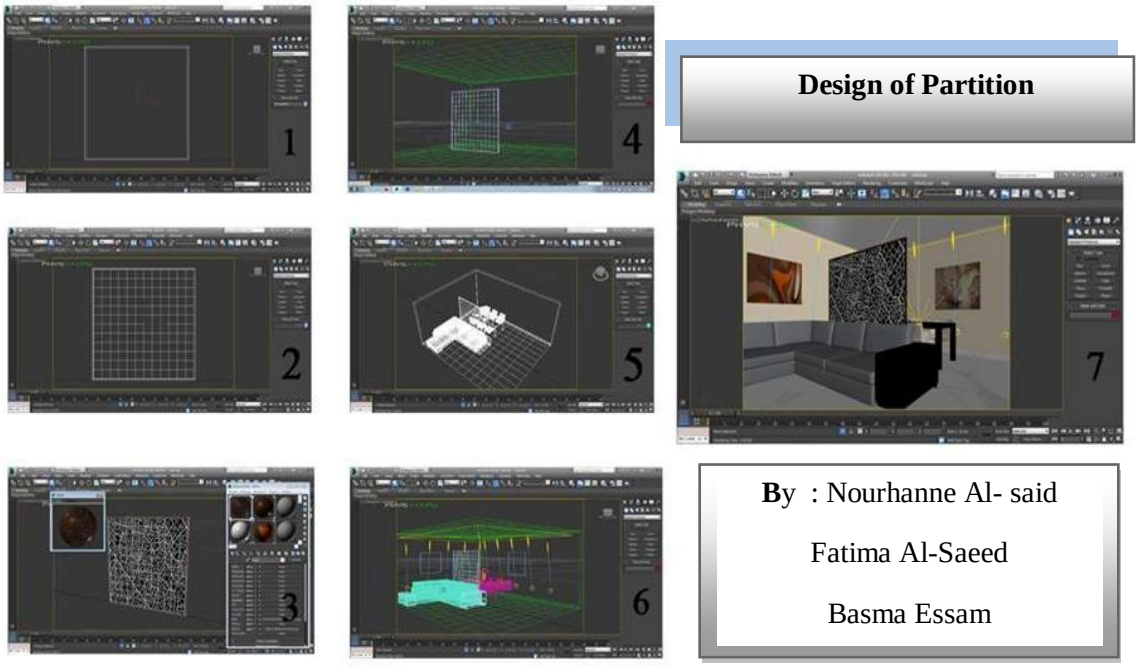


Figure.12, b

Figure.13

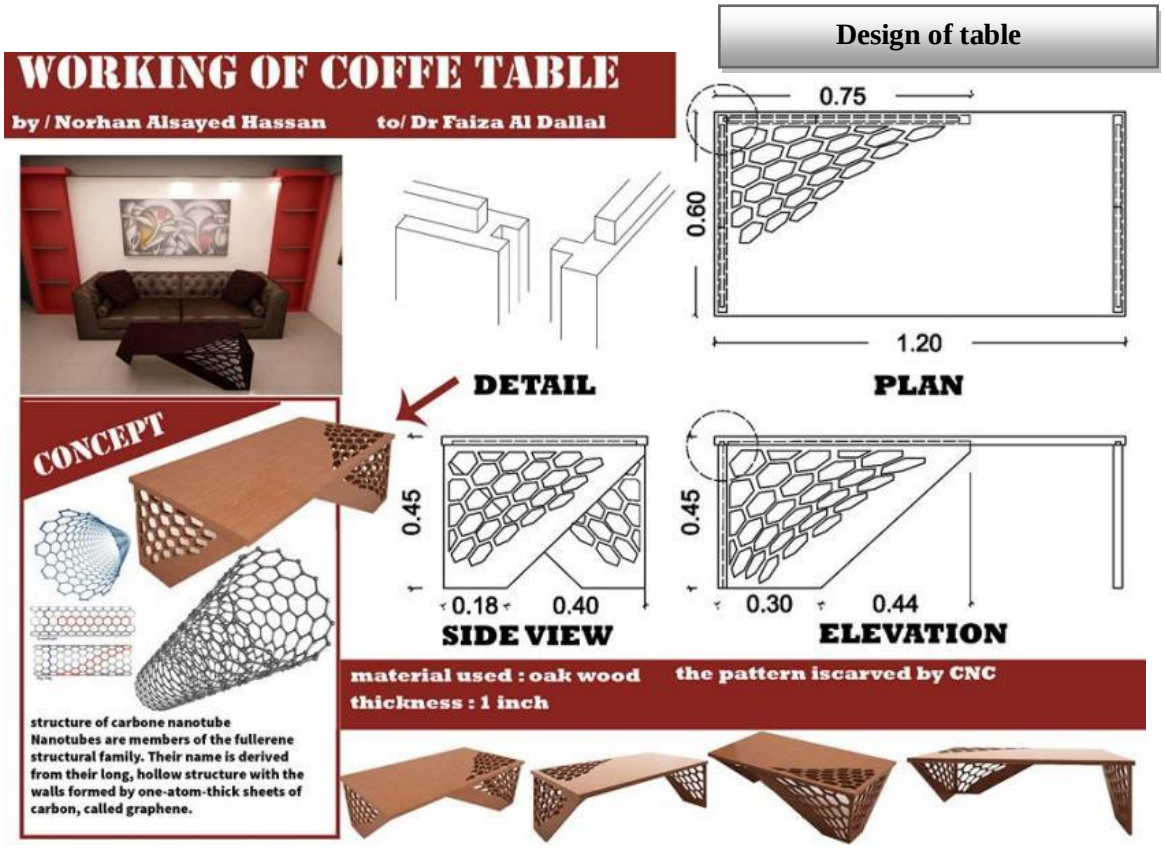


Figure.14

Digital fabrication by using Morphological thought in interior design

4-6- Hologram technology in the interior design of the second year students Decoration department"

Students replace the Holographic picture technology by using new technology:

- Dropping a video film from the computer and receive the image on the Black paper.

- After passing throw glass sheet and then reversed on lens's glasses, we can see the image of the robot moving in the air.

It is considered a patent for these students about their implementation of this

Technology by their Personal tools and costs very few.

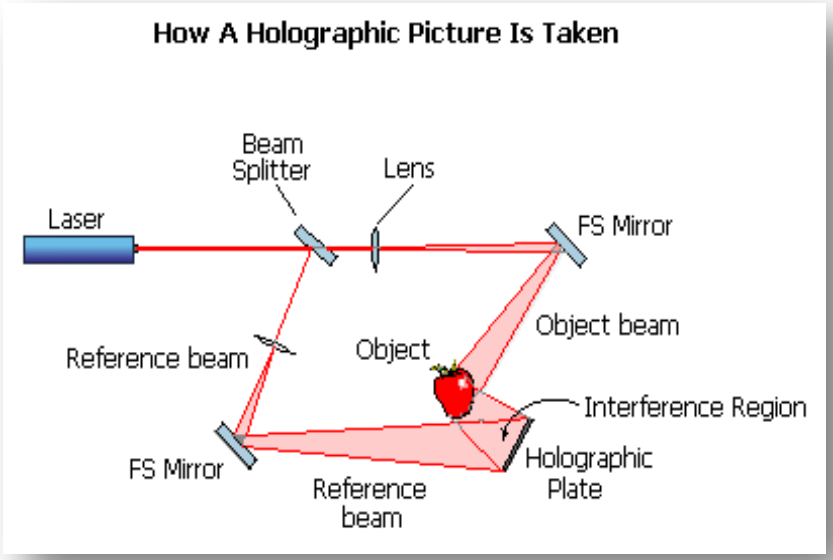


Figure.15, a: **Case study.2**

Academic project by:
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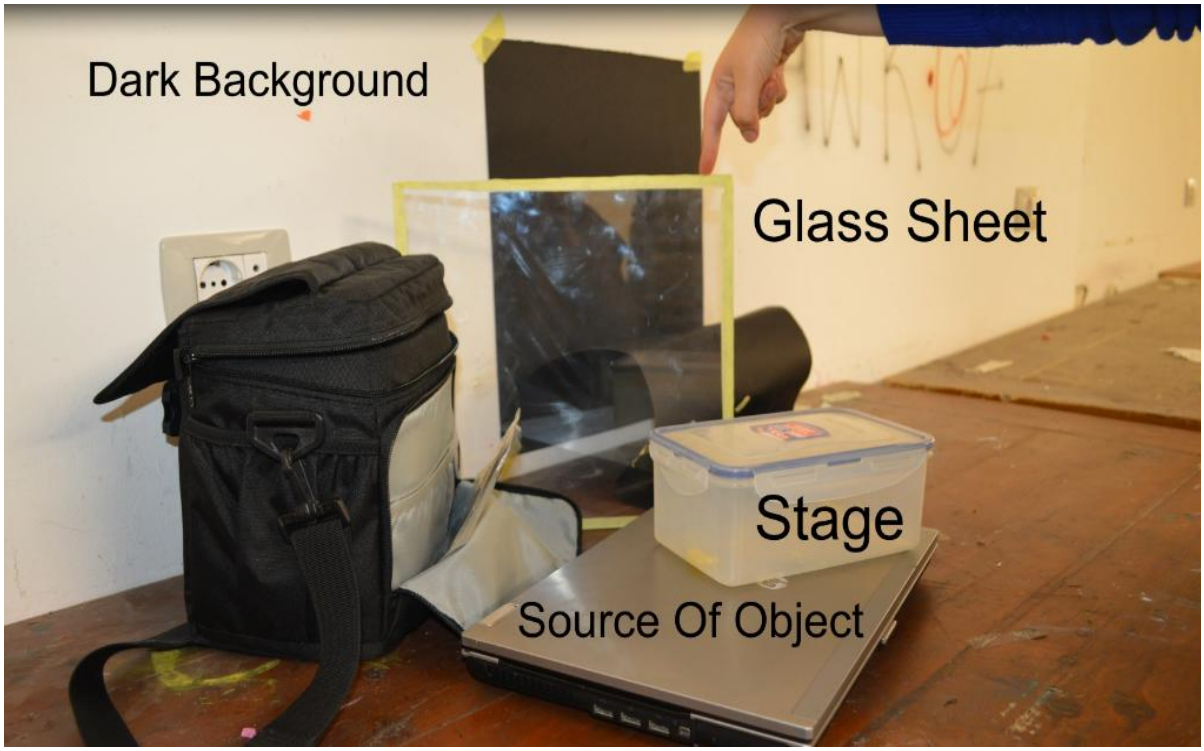
Nour Tarek, Maha Anwar, Alaa alsaid, Kareman Hamdee

Supervision:

Dr/"**Fayza Eldlaal"**

Recognized tools to configure the Holographic picture



New tools to configure the Holographic picture

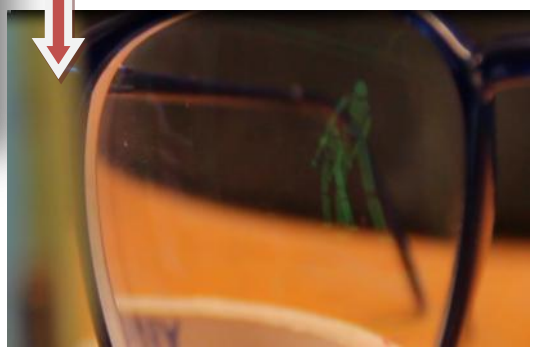


Figure.15, b

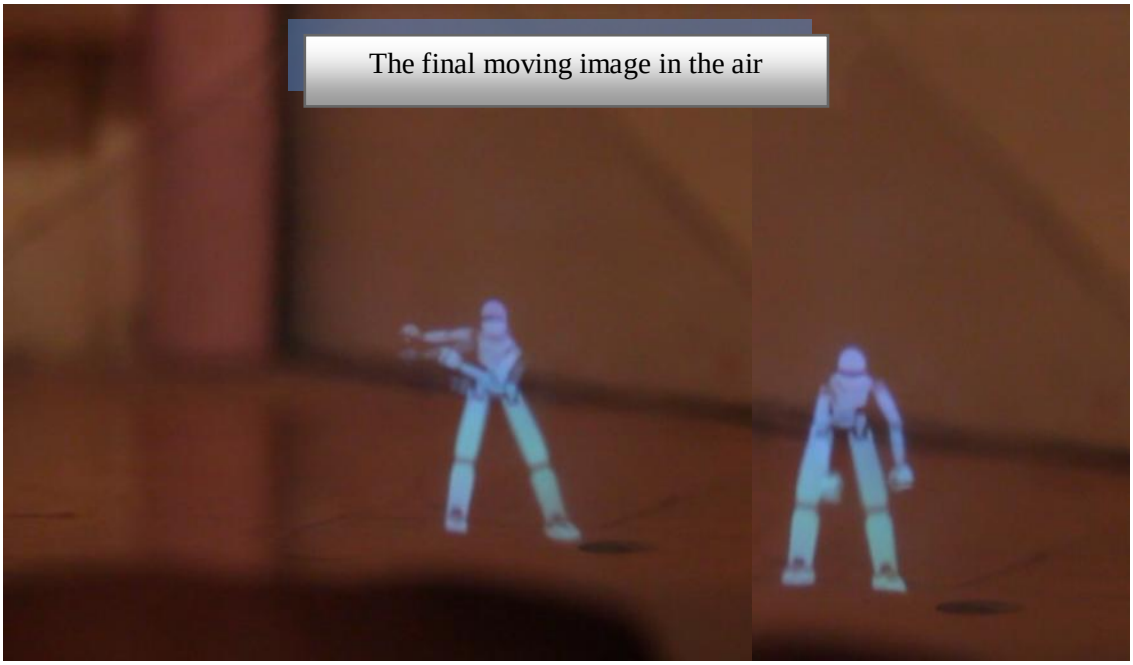


Figure.15,c: Shows the steps followed by the second year students of 2014-2015 in the presence of innovating thought the presence of three-dimensional holographic image in the air through simple techniques similar to the advanced technologies used in the manufacturing process for holographic image, which lead to the presence of many dramatic effects within the internal space.

In the end, no student without a creative teacher respects the student's thinking and plans for him.

Results

-Design thinking is a creative process based on "constructive" ideas, and it cannot be judged on design thinking in its infancy. This eliminates the fear of failure, and is encouraged to put up a large number of inputs and posts in the two phases of imagination and put early model prototype.

-Design thinking is encouraged to think outside the box in this early operation.

-The most important factors affecting the process of creative thinking:

Sensitivity to the problems of a factor that is part of the evaluation which is still swinging between knowledge of nature and of nature moods, fluency, flexibility and originality [32].

-The ability to innovative thinking are overlapping components, and are still in need of serious research to enrich the educational and psychological studies to which we can guide the generations towards the desired best.

- The concept of innovative thinking is one of the modern concepts that have been developed in the field of educational psychology, cooperative learning helps officials in educational institutions to discover students with preparing innovative, and can result from technical innovations mechanical inventions push the march of development and progress.

- The basic purpose behind education programs not only thinking of students of scientific knowledge but also helping them to create a frame of reference and their own individual way to know the reality in which they live.

- The components of the Guaranteed Learning Model are the following: design a task analysis, develop criterion tests and performance measures, develop interactive instructional materials, validate the interactive instructional materials, Create simulations or performance activities (Cooperative learning under study) That due to a new way of thinking for students.

The components of the Guaranteed Learning Model

-Linking Applied study in the faculties of fine arts equipment and scientific equipment, which reflects the technology such as digital technology in the manufacturing, three-dimensional printing, recycling ,the presence of nanotechnology and materials hybrid technology, as well as the great need for these colleges to the presence of teaching programs that encourage this kind of thinking within Education curriculum ,for example Digital fabrication: it is a design and computer aided manufacturing (CAD - CAM) dependent on the computer as a means of building and cutting parts[33], which Constituent vertical and horizontal vocabulary within the space .Diploma students (Case Study) used morphological thought and the use (CAD - CAM) to implement their designs

- The teaching technology to students is important in our times where the buildings became 'dynamic': equipped with sensors, actuators and controllers, they 'self-adjust' in response to changes in the external and internal environments and patterns of use [34],and Robotic automation also has become ubiquitous in the modern manufacturing landscape, spanning an overwhelming range of processes and applications-- from small scale force-controlled grinding operations for orthopedic joints to large scale composite manufacturing of aircraft fuselages. Smart factories, seamlessly linked via industrial networks and sensing, have revolutionized mass production, allowing for intelligent, adaptive manufacturing processes across a broad spectrum of industries. Against this background, an emerging group of researchers, designers, and fabricators have begun to apply robotic technology in the pursuit of architecture, art, and design, implementing them in a range of processes and scales. Coupled with computational design tools the technology is no longer relegated to the repetitive production of the assembly line, and is instead being employed for the mass-customization of non-standard components. This radical shift in protocol has been enabled by the development of new design to production workflows and the recognition of robotic manipulators as "multi-functional" fabrication platforms, capable of being reconfigured to suit the specific needs of a process [35].

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