

The role of the capstone project in supporting the job experience of industrial design graduates in the field of work

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Introduction

The capstone project is an integrated educational program experience, where students are able to think about all the things that were important to a student in university life by solving the most complex and difficult problems in the early educational stage. Thus, it helps in preparing the graduation project that prepares the student for practical life. Therefore, the graduation project is considered one of the most important contemporary global applications, through which it is possible to support the academic program for industrial design in Egypt and develop its professional expertise. In addition to the above, the Capstone in Industrial Design is a course offered for university students. The students work in teams and at the end of each semester the students submit their efforts in designing the required graduation project. Accordingly, it provides students with job opportunities suggested by sponsors of industrial and research projects.

Research Objective

Highlight the application of the Capstone project in the educational program, which may help the industrial designer to delve into practical and professional life to build contemporary designers and well-experienced thinkers who can bring their work together in a coherent, clear and well-organized manner, taking into account the requirements of the profession they are interested in during the design process.

Research Problem

The industrial design graduate faces a large gap between what he practiced in university life and what he should be in practical and professional life.

Research Methodology

The research is based on the descriptive analytical method to identify the importance of the role of the capstone project in supporting the functional experience of the industrial designer in the field of work.

Definition of Capstone:

The philosophy behind the definition of capstone is interesting as it is known as the main stone, and from an architectural point of view, it is the final stone that is placed directly on top of a concrete structure to symbolize the completion of its construction. The cornerstone project becomes the last stone in the education path, which represents the student's work that is accomplished throughout his university life, which indicates its successful end.

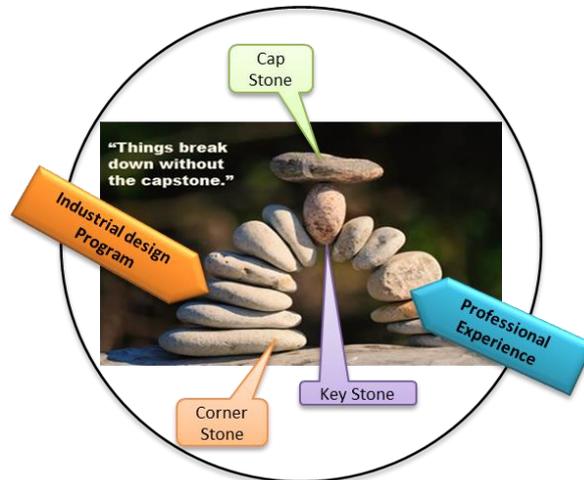


Figure (1) shows the integrative relationship between the capstone, the industrial design program and the professional experience.

The capstone methodology for students of industrial design and its application

Capstone projects are defined as a complex task that involves several steps, and requires academic skills and intellectual expertise. Hence, the method of applying the Capstone Project in the collective work of the students is the concept of cooperation in the Capstone projects, where groups of students gather around a goal, a major idea, or a national project that they seek to implement; For example, the students are divided into groups, each group within the limits of (5 students) so that each group works in collective cooperation in accomplishing a small task that integrates into a task or idea for another group and for a third group to integrate these ideas under a larger and more general idea called the capstone, so that students choose one of the challenges and work to come up with solutions for them through the proposed projects.

Also, these projects are interdisciplinary in the sense that they require students who are able to use and apply skills and research in a variety of subjects and identify the most important content for their learning. Capstone projects also encourage students to continue their projects to solve community problems and issues and integrate outside of university learning experiences through various activities such as interviews and observation, and training. Capstone projects are considered progressive projects that require students who are able to demonstrate a set of core values and standards and apply the foundations of knowledge and skills. These standards and skills are defined as follows:

➤ ability to think critically and creatively. A

➤ demonstrate flexibility and initiative. D

- conducting good research and analysis, including proper quotation from various references, whether (paper, electronic, interviews....) C
- communicate ideas through multiple ways. C
- development and application of verb research. D
- use technology effectively. U
- work with a consultant or expert in the field. W

The impact of engineering design on capstone projects for the industrial designer

Teaching scientific concepts in an engineering design way has proven its worth in teaching industrial design topics. In the study, researchers have proven that the use of scientific concepts in design has a positive mental and physical impact, and is in line with metacognitive strategies. Therefore, the benefits of the Design Process Engineering in capstone projects are:

- Expand their thinking,
- Become more innovative,
- Learn from their mistakes.

The importance of the capstone project

The graduation project has become an integral part of the undergraduate degree curriculum. It can take different forms, but its purpose remains the same. The Capstone Project is therefore a unique opportunity to conduct independent collective research in order to devise an innovative solution to a problem in the real world. While a project of this scale can be challenging, it can be Highly rewarding, a capstone project is usually the final assignment and plays a vital role in preparing students for the world of business thanks to its practical applications and ability to help hone students' professional knowledge and skills.

The following are among the tasks of implementing the capstone project for students of industrial design: Expands confidence and self-awareness, helps increase rigor of previous years, enhances CV and builds skills, demonstrates knowledge and learning.

Based on the above, there are important points to remember about the Capstone project

- Capstone project is usually divided into two parts, Capstone1 and Capstone2.
 - Capstone1 is the topic selection and proposal submission that takes place during the first semester of the year. Capstone2 included the actual research and experimentation of the project, which ends with the presentation of the project at the end of the year.
 - Capstone1 and Capstone2 are rated individually.
- Students are required to submit well-researched academic papers on the chosen topic.
In addition to academic papers, students must also give a presentation on the topics.
- The capstone project submitted by students is stored in the university library and database for years to come.

The Capstone Methodology for the Career Advancement of the Industrial Designer

The main purpose of the capstone project is career advancement. Therefore, this project is designed to prepare the future challenges facing the industrial designer in his career. In fact, even the topics that are assigned to students of industrial design (or even those chosen by the student) are intended to help him analyze real-life problems so that he can find appropriate solutions for them, which increases wisdom and knowledge and thus can enhance basic knowledge in a course specified to provide alternatives about the academic career that must be pursued once the studies are completed as it helps students discover their interests and follow requirements of labor market accordingly.

Examples of capstone projects from some industrial design universities

Brief on capstone projects at Rochester Institute of Technology, where Capstone projects are taught based on an integrative design program. The final project of the one-year program focuses on the application of design methods and processes, design thinking, problem solving and concept development.

In the following figure, the problem of airport chairs is presented, where luggage causes inconveniences when passengers are waiting to board the plane, and the result is uncomfortable sitting, and continuing to take care of luggage. And through the search for User Research, by conducting interviews with a number of passengers, where 100% of the 50 passengers expressed their dissatisfaction with the crowding of luggage at the airport, and therefore some solutions were developed and the best solution was chosen to avoid this problem, which is Redesign airport chairs to become as the last form as in The model shown in Figures (٢), (٣).

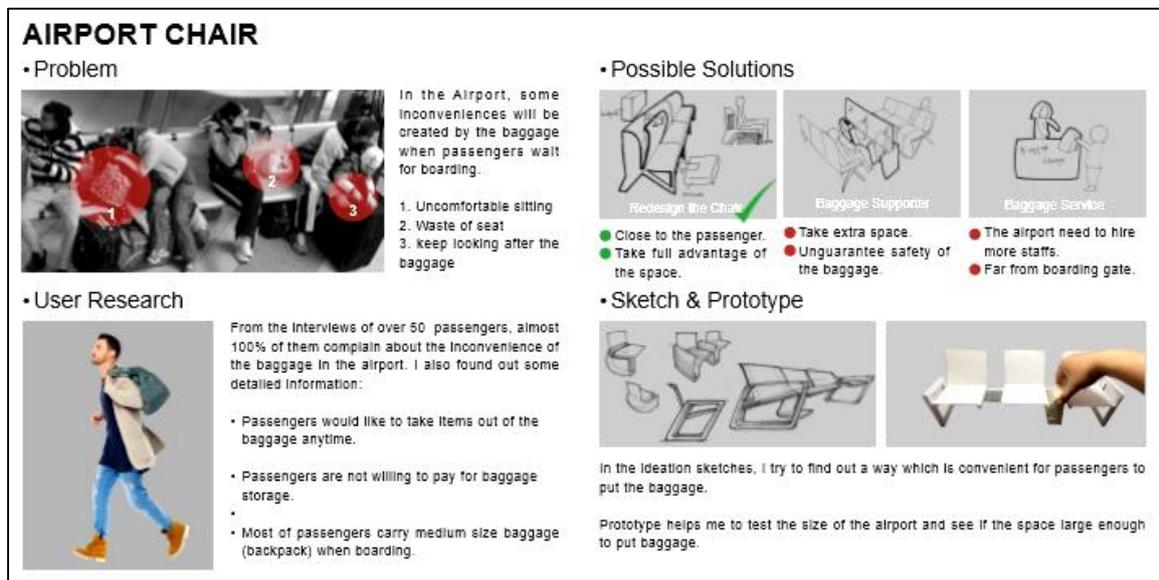


Figure (2) shows the way to display and solve the problem for the airport chair design

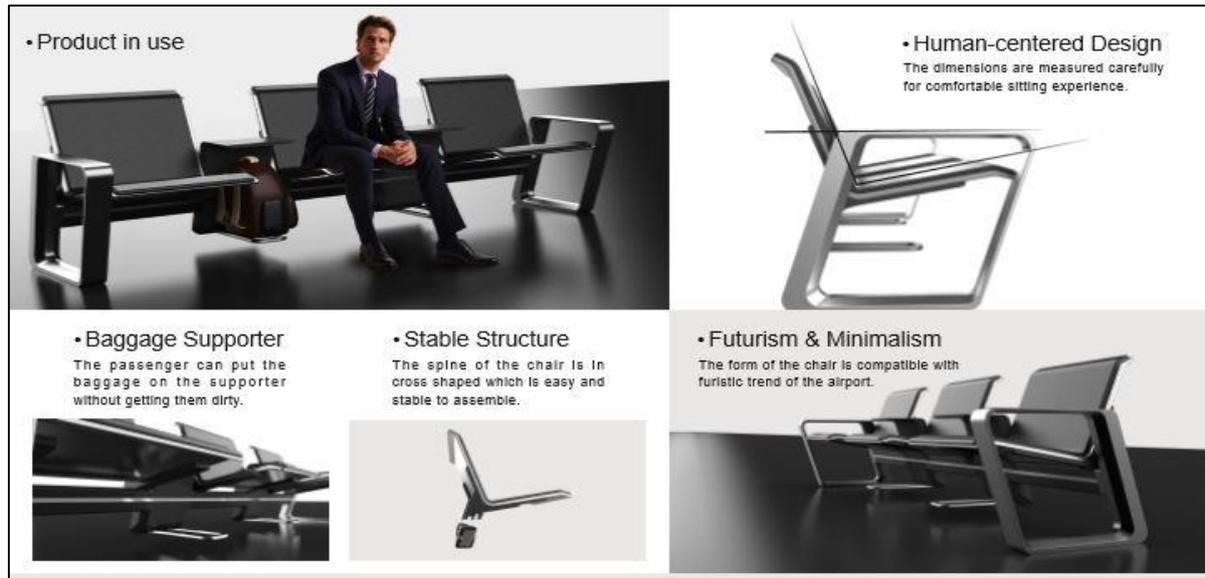


Figure (٣) shows the final design implemented for the Airport Chair

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