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Coin Game to Improve the Education of Designers in Product Design

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ABSTRACT

The education of the creative professions is always a challenge, and speaking of the new generations of product designers further complicates the need to find new ways to capture their attention and correctly teach the basics of design. That is why we present a teaching tool that promotes design education, the logic of design together with the concept of play, called "Fichas".

Keywords: Product design, Industrial design, Design methods, Design education, Design workshop, Educational games

INTRODUCTION

Understanding creative careers is always a challenge in design education, as students in these areas are demanding personalities, looking for the creation of entirely new objects, innovation at all costs, the great idea, the fast payback, in a changing society, where every second generates new technologies, and where it is wrongly believed that everything already exists. The pressure of success on these personalities who seek to create new objects at all costs abounds in the market. Objects lacking research without a hint of a design process flood stores and are called junk products. For that reason, it is imperative to properly educate product design professionals since it is a reality that the market lacks products that solve current problems, such as medical products, products that support mobility, child safety, mobility of disabled people, etc. Learning per se is a necessity, as is the care of creative personalities during a systematic process. How the design process is, and what better didactic than the combination of play and learning.

Industrial Designers

According to Industrial Designers Society of America (IDSA), Industrial Design is the professional practice of designing products, devices, objects,

and services used by millions of people worldwide on a daily basis. Industrial designers usually focus on the physical appearance, functionality, and manufacturing capability, although they are often involved in much more during a development cycle. Ultimately, this extends to the overall enduring value and experience that a product or service provides to end-users.

All the objects we interact with daily in our home, office, and school result from a design process. During this process, an industrial designer and his team make countless decisions to solve problems through well-executed design. The inclusive design takes into account the different characteristics of users creating products that are accessible and usable by as many people as reasonably possible (Jih, 2021).

Design Process

From the beginning of the Bauhaus to the present day, the Cartesian project method, complemented by the workshop strategy, has been the basis of design teaching. This teaching system where the teacher guides the students in the development of simulated projects according to a certain reality, and the student learns based on practice and experience, which requires a methodological basis, together with a convergent capacity for interconnection of heterogeneous facts (Morales-Holguín, 2020).

Industrial Design Students

The main characteristics of design students can be defined into three main categories; visual thinking, creative thinking, and flexible thinking. Thought is how we receive, process, and use information. Skills arise from these ways of thinking (Skaggs, 2002).

Coin Game

The game was created by industrial designer Fabiola Cortes Chaves, who started applying the tool in 2006 at the industrial design faculty at some private universities in Mexico. The game immediately showed a student approval of 90%, which was applied as a teaching tool for practical classes in designing new products, called: "design workshop." The goal is for students to acquire priority skills, including the exposition and sale of the design concept, research, justification, an argument of design, criticism of the invention, and self-criticism. This is done through coins game in which the teacher acts as facilitator and mediator, while all students play the role of design critic and designer advocate for their idea.

DESCRIPTION OF THE TECHNIQUE

This method has been used since 2006. It is named after the chips that are used; each has the value of a certain number of tenths in the students' final grade. Since its beginning, this method has been used at three different universities; Tec de Monterrey Campus Guadalajara, Tec de Monterrey Campus León, and the Pan American University Campus Guadalajara. Over the course of 16 years, around 1184 students from the 4th to the 9th semester

Table 1. Game rules.

Team A	Team B	Result
Correct Question	Incorrect answer	B loses 1
Correct Question	Correct answer	Draw, none lose, none win
Wrong question	N/A response	A loses 1
Annoying member loses control	-	A loses 1
Member mocks the B team.	-	A loses 1
The member who helps the opposing team	-	A loses 1

have participated in Industrial Design, Industrial Engineering, and Innovation and Design Engineering courses. They have formed two to three groups of approximately 15 students per semester, even competing.

Implementation

At the beginning of the semester, each group starts working under the same design brief chosen by the teacher. Students begin with the research and development of different sketches until they arrive at the first volumetric models, where the card dynamics begin. This can be repeated as many times as necessary during the semester whenever there is a new model delivery, the final prototype exam. Up to 30 points of the final grade have been played in a single game. However, the students have lost all their points; the teacher does not take away their coins but explains that the real goal is for them to learn to defend their designs with reliable arguments and at the same time to learn how to criticize other designs process.

Game Order

1. The teacher explains the game's rules to the students, and the number of rounds of questions is determined.
2. Each student has 3 minutes to present each of their projects; this exhibition must include the function, user, and justification. Students from opposing teams can make notes during that exhibition.
3. Once all teams expose their products and the game's rules are explained, each group is given 15 to 20 minutes to supervise all the opposing team's products, even allowing them to see the opposing teams' objects in detail and work to structure their questions.
4. Once the teamwork is finished, they return to their places and must put their products in view of everyone, from the general view.
5. Question time begins; each turn has the right to ask two questions of context (maximum) and one coin question. The rules for questions are presented below:
6. At the end of rounds, the teacher finishes the game, asking the students their appreciation. 98% of students agree that the game helps them finally understand what product design is about and why every decision must be based on research and have an argument.

Table 2. Game stages.

Stage	Image
Exhibition of the projects	
Placing projects in plain sight	
Product Review	
Formulation of questions	
Question from the first team	
Response from the opposing team	

7. In the end, the coins collected are the points they added for their qualification.

An essential component of the human systems integration plan should be a verification and validation process that provides a straightforward way to evaluate the success of human systems integration. The human systems

integration team should develop a test plan that can easily be incorporated into the systems engineering test plan. The effective performance of the system needs to be validated as part of the overall system. It may seem more attractive to have stand-alone testing for human systems integration to show how the user interacts with controls or displays and how the user performs on a specific task. This methodology can address the performance of the human operator or maintainer with respect to the overall system. The most important thing is to develop a close relationship between human systems integration and systems engineering.

CASE STUDY

The case study was carried out with students of the 2nd and 3rd year of the Industrial Design career. The project aimed at the design and development of new products. The project's guidelines required realizing a person's file, detecting a problem, and developing a solution through a product. Among the 15 members, 3 or 4 people were formed, which worked for four months.

Teams start with 3 coins, each worth 10 points out of 100 of their overall course grade, in each question time, each team can lose or win a coin, as well as be tied. At the end of the game the teams lose and win coins, if there are occasions where a team loses all its coins. The game begins with caution; no one wants to attack their classmates, but it becomes competitive; at the moment of questioning the first team, that same team gets even with the next one and immediately becomes an intense competition, tempers accelerate, teamwork begins, shouts, laughter, research on their cell phones to check and look for information that helps them question the design arguments of the opposing team or to justify their designs with more significant argument. The reactions of the students at the end are of approval to the tool; in 98% of the cases, the ability of the facilitator teacher is essential since he must be attentive to the changes of mood of the students to avoid bullying to a specific product or reassure the most skilled students and help them to question proactively, as well as helping weaker students defend their designs.

CONCLUSION

Learning about the importance of the design argument, the criticism and defense of one's design increase markedly. According to the evaluations made by the students, this technique has been of utmost importance to understand the objective of the design how the products must start from a correctly elaborated design process too, in turn, achieve the argument that justifies the creation of a new product. Presenting this tool to more educators to support the design process of product design during student training has shown that a single game can increase understanding of the design profession and has demonstrated its effectiveness with students in a passing response more significant than 90% over the past ten years. The design teacher who works as a facilitator must have group control and expertise in the product design process.

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