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## INCLUSIVE DESIGN AS A TRAINING AREA FOR THE INNOVATION OF PRODUCTS AND SERVICES

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**Abstract:** Inclusive Design adopts an integrating vision of the project in which sensitivity prevails to meet the needs of a wide range of users regardless of their abilities. The objective of this communication is to promote and show training in design and innovation, associated with ethical and social commitment.

**Keywords:** Inclusive design, innovation, accessibility, social design, disability.

## INTRODUCTION AND GOALS

The perspective of Inclusive Design proposes an integrating vision of projects in which sensitivity prevails to meet the needs of a wide range of users regardless of their abilities. This vision of design is still today a pending area in practice since it is a holistic approach, committed to the diversity of individuals and society in general. Professionals, trainers, those responsible for management and design projects, and even public administrations, must value this quality of the project, which has inclusion and equity as a challenge. The objective of this communication is to promote and show training in design and innovation associated with ethical and social commitment.

The introduction presents the specific field of inclusive design, the justification for its relevance as a concept and its implication with the transversal competence Ethical and Social Commitment. The communication is structured in three parts: the first specifies the object and scope of this field of design, the state of the art and the projects that are grouped in this direction. The second constitutes the nucleus, presenting the methodology that guides the teaching-learning process in the Design and Accessibility subject and summarizes the main aspects that intervene in the acquisition of this transversal competence and its validation. Finally, as a result, the transfer of these projects is collected through

an exhibition included in the Valencia World Design Capital 2022 program, which has made it possible to show the general public the potential of design to overcome individual limitations and improve the life of society as a whole.

The perception that society and companies in general share about the activity of design is usually related to the demands of the market and, therefore, some aspects such as the need for novelties, the idea of the inspiration component and a certain image take on special value. exaggerated of unique products, designers and prestigious brands. In this context, we consider it necessary to return to the challenges implicit in the exercise of design that aim to propose and develop truly innovative and committed projects.

In the current technological context, the accessibility, adaptation or personalization of products cannot be understood as an approach to the problems of “a few”, but must be understood as an imminent issue that affects us all and is reinforced due to the constant increase in an aging population that requires greater care and attention in their daily lives. It is a factual situation that, together with energy and ecological issues, overcoming architectural barriers and accessibility are priority issues that are on the agenda and constitute a trend with a vision of the future (Ficher and Meuser, 2009). Consequently, in order to respond both to the demands of the professional environment, as well as to the training ones, which point to competencies as an integral development of the individual, it is necessary to promote the critical vision and creativity of the designer towards his social involvement. The Design and Accessibility subject collects these objectives and develops them from project-based learning.

Since 2014, the UPV has been working on the implementation and evaluation project for the transversal skills listed in its institutional

project. The UPV considers three main ways to acquire these skills: study plans, final degree projects (or master's degrees) and extracurricular activities. Due to the essential implication (in objectives and contents) of the Design and Accessibility subject of the Official Master's Degree in Design Engineering, with the transversal competence Ethical and Social Commitment, the subject has been a control point for the evaluation of its acquisition.

## **INCLUSIVE DESIGN IN THE DESIGN LANDSCAPE**

Inclusive design emphasizes the characteristics and diversity of users. Obviously, it can be closely related to other concepts such as Social Design or Solidarity Design, although these approaches are oriented towards planning and developing development cooperation projects and social action projects, following different methodologies.

The antecedents of inclusive design and accessibility are multiple and find their start in the seventies (Papanek, 1977) in professors and design theorists who questioned the utilitarian orientation of design at the service of consumption and industrial development (Bonsiepe, 1985) (Maldonado, 1993), (Margolin, 1985). In Europe, the initiatives of the Swedish government support companies such as Ergonomidesign and A&E Design specialized in design for the disabled and the elderly, with the aim of developing this design approach that would be explicitly reflected in the Stockholm Declaration (2004), whose motto it is clearly vindictive: "Good design enables, bad design disables".

In the eighties, the concept of Design for all / Design for all (Mace, 1987) proposes some principles with the aim of simplifying the lives of all people, through the characteristics of the products and the built environment. These seven principles of universal design continue

to be a reference for design: being fair, flexible, intuitive, offering perceptible information, error tolerance, minimizing efforts, and adequate dimensions, although they are still an idea that is little implemented even today.

The term Inclusive Design / Inclusive Design (Inclusive Design design.designcouncil 2012), more widely used today, affects this integrating aspect of design, as social design; that does not exclude a part of society. A design capable of generating profits and markets, which studies and analyzes the needs of different people and proposes instruments and solutions for all of them.

## **DESIGN AND COMPETITION ETHICAL AND SOCIAL COMMITMENT**

Starting from the definition of competence proposed by Tardif (2006): Knowing how to act complex that is based on the mobilization and effective combination of a variety of internal and external resources within a family of situations, the scope of the design project constitutes a framework ideal for the development of transversal competences since multiple aspects coincide in it that affect the integrated use of knowledge, skills and attitudes in action.

The transversal competence Social Commitment points to the response that an individual gives to the reality that he lives. That is, make decisions and actions to make living in community worthy, respectful and, above all, establish policies to support the weakest. The objectives of the Design and Accessibility subject include these intentions, combining them with their professional skills:

- Raise awareness and sensitize towards the situations of disadvantage that man faces from his diversity (the physical environment, obstacles, resources).
- Involve the designer in the specific needs and problems posed by multiple products

and environments for different users and user groups.

- Provide operational knowledge in support systems for the design of specific adapted products for different disability problems.
- Develop a committed attitude towards inclusive design so that the environment is increasingly suitable and safe for the requirements of people, regardless of their abilities and stages of life.

## METHODOLOGY

The approach of this subject is based on the understanding of the differences between people and the possibility of intervening from the adapted design. To this end, active methodologies are proposed and different activities are carried out that lead to student learning and the development of their skills and abilities applied to the design of products more in line with diversity and functional limitations. Emphasis is placed on the value of creativity to improve the accessibility of environments, products and services.

The backbone of the subject is the design project (in which the student body feels comfortable and capable), proposing thematic areas of research and experimentation in which they must previously identify for themselves, specific problems on which to act. It works from theory and practice in the identification and search for situations, technologies and products that can be designed or re-designed to achieve greater adaptation and accessibility. To stimulate their involvement and creativity, the “Decalogue of Creativity” (Fuentes and Puyuelo, 2015) is applied as a basic methodology. The student has to bring their own experiences, express their beliefs and creatively respond to general questions before facing specific questions more related to her discipline. For its elaboration, basic

concepts have been taken into account such as the question and the impact as a motor of creativity, or the relationship between creativity, motivation, what is known and thought (Amabile, 1998). Of course, the problems faced in teaching activities are relevant due to their functional objective (multiple requirements are raised, Fig.1), but also because they are significant, committed and open. We can all suffer from disability problems and, consequently, be beneficiaries of better solutions.

## RESULTS













 Audio-Visual	 Video, AR
 Educational	 Text, Quiz, Interactive Timeline
 High accessibility	 QR
 Blind friendly	 Audio, 3D Model, Braille, tangible tile
 *Wheelchair friendly	 Ramp, height 1.1 cm, tilted displays
 Kid friendly	 Height 1.1 cm, visual, tilted displays

Fig. 1. Scheme of stimuli proposed in the development of a project. Source: University Master’s degree Engineering in Design MUID students.

The incorporation of the thematic area of inclusive design responds to the need to broaden knowledge and complement the design student and researcher’s curriculum with specific content on integration and accessibility.

6 mutually permeable project areas have been opened up as research areas, offering

a wide spectrum of topics for planning design projects and Master's Thesis. These areas respond to the concerns and the work developed by the research group of the Architectural Graphic Expression Department around accessibility and the environment of collective use, in which they have different publications, Final Master's Projects (TFMs and Doctoral Theses In the last decade, more than a hundred high-quality projects have been developed with a high level of innovation and technical resolution (Table 1).

Course year	Topic	Projects
2017-2018	visual limitations	15
2017-2018	Old people	14
2018-2019	Accessibility and area for Persons with Reduced Mobility (PRM) in transport	16
2019-2020	Epilepsy protective helmet	10
2020-2021	Co-design with people with limitations	7
2021-2022	robotic assistant	12

Table 1. Topics of group projects and number per course since 2017.

A wide selection of these proposals, along with some outstanding inclusive design products, has formed the core of the exhibition “Inclusive and Social Design. Design for people and common interest” (Figure 2), carried out at Las Naves del Excmo. Valencia City Council, during the first quarter of the year, in the program of Valencia World Design Capital 2022.



Fig. 2. Products and projects in the exhibition “Inclusive and social design. Design for people and collective interest”. Ships from December 2021-February 2022.

## CONCLUSIONS

From the experience obtained in these years, the student's awareness of the transversal competence Ethical and Social Commitment stands out in all the analysis and project experiences carried out in this teaching context. Given that this is a checkpoint subject, at the beginning of the course, the levels that determine its achievement and the assessment of the results obtained are established, which directly guarantee the acquisition of the competence: firstly: awareness of the importance of competition and basic application in different problems

through the critical analysis of products and services. The range is opened to the variety of potential proposals for the development of the project. Next, an internalization and skillful handling of the competition in the resolution of a design proposal, argued and viable, takes place. that solves and communicates with solvency the solution obtained. These phases have made it possible to apply knowledge to practice, experience an autonomous and responsible learning system, with initiative and innovation.

The aforementioned exhibition has integrated these quality results into a real project transferred to society together with products from the real industrial environment and objective of this design approach.

## THANKS

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*The EIDD Stockholm Declaration* <http://www.designforalleurope.org/Design-for-All/EIDD-Documents/Stockholm-Declaration/>