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Ergonomics / Human Factors Applied in Formative Research at the Faculty of Industrial Design, Universidad Pontificia Bolivariana

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Abstract

One of the teaching strategies at the Faculty of Design's Ergonomics Research Division at the Pontificia Bolivariana University (UPB) in Medellín, Colombia, incorporates the conceptual, technical and procedural foundations of Ergonomics/Human Factors with the development of degree work. This is conducted within a framework known as the System of Training in Research (SFI, in its Spanish acronym), and whose objective is to educate in the research process, with the design project as a reference point. This paper presents the SFI's structure and objectives, its relationship with the Industrial Design Curriculum, and the way it interacts with the principles of Ergonomics/Human Factors and the investigative training courses in design. The paper also presents a summary of two projects (degree work) that has sport (and related products, systems or environments) as a central theme, and includes their general objectives, methodologies, a brief description of fieldwork and the results of the process.

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1. Introduction

The Faculty of Industrial Design at the Pontificia Bolivariana University (UPB), in Medellín, Colombia, through the Design Studies Research Group's (GED) Research Divisions, and, for this specific proposal, through the

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Ergonomics Research Division, carries out teaching activities in theoretical-practical undergraduate and postgraduate courses, and research activities through the erGO research seedbed, degree work and applied project research. In addition, it establishes a relationship with other bodies through the development of consulting projects (outreach). These respond to a model of educational practice, which emphasizes research as an alternative for finding and creating a permanent body of knowledge [1].

The research carried out in seedbeds and degree work is based on a model known as the System of Training in Research (SFI, in its Spanish acronym). The SFI helps to logically and methodically organize a formative research project (case study work) that has been set up to address a problem, question or design opportunity, and to establish an active and constructive relationship in the generation of knowledge, applied to a design project [2].

As a research division of the GED, Ergonomics/Human Factors forms part of the SFI through projects with this focus. Thus, students at the Faculty of Industrial Design and teaching staff at the GED carry out a five-stage process: the creation of a framework, fieldwork, analysis of results, the development of a prototype, and the evaluation and test-piloting of a final product.

As a result of this process, three examples of formative research projects are presented, based on topics related to suitability (design and redesign) of products, systems and sporting environments.

2.The system of training in research

The Institution maintains its strategy of becoming a research-based teaching university. With this in mind, The SFI is the mechanism through which the Faculty of Industrial Design at the UPB, which maintains a strategy of becoming a research-based teaching university[3], contextualizes, integrates and articulates curriculum content towards an objective of investigative academic training in design.

The objective of this process is to train and educate in research. However, it is not research in the strictest sense of the term; rather it helps the learning process through discovery and creation, drawing on strict research through a direct relationship aimed at providing relevance and pertinence[4].

The SFI has been characterized and based on GuiBonsiepe's endogenous and exogenous research classification [5]. As the prefix suggests, endogenous research evaluates design from within the discipline itself. Exogenous research, on the other hand, observes and studies the discipline from outside the system i.e. design becomes the focus of study from other meta-disciplines, such as psychology, health or engineering.

The Faculty of Industrial Design at the UPB proposes a design research model, shown in detail (see figure 1), which emphasizes the objective of the profession (formed at the INFORMATION stage), and which is continually observed by knowledge (formed at the APPLICATION stage). Both observe the wider environment through a series of meta-disciplines. This model is conceptually and administratively supported by the GED and its four research divisions.

The Project and Innovation Research Division guides and directs research for the project and for the discipline. The Faculty of Design at the UPB, whilst recognizing a wide range of design disciplines, proposes three basic groupings: Ergonomics, Experimental Morphology and Material Culture. These groupings represent the other three research divisions of the GED, and have been incorporated into the basis of the curriculum, becoming key concepts in the design project: the functional-operational dimension, the morphological-productive dimension and the aesthetic-communicational dimension.

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