Chapter 10
Teaching Fire Safety in Schools of Architecture: The Spanish Case

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ABSTRACT

Fire safety teaching in schools of architecture has become more relevant over the last years in Spain due to the influence that it has in the professional architectural project. The introduction of fire safety knowledge in the intermediate courses of architectural studies has important advantages for the student, who quickly perceives the project as a normative discipline. However, fire safety regulations are complex and difficult to understand for the students. The experience along the last years has progressively evolved from an analysis of the legal documents to a more frequent use of graphical representations. A combination of symbols, diagrams, and simple drawings has proven to be quite effective: Symbols act as anchor repeated throughout the learning process. Diagrams are a first approach to the characteristics of the building. And the simple drawings complete the information so the students can work on the proposed exercise.

INTRODUCTION

Fire Safety (FS) aims to prevent and mitigate the unwanted consequences and effects of fire. The Society of Fire Protection Engineers, an international pioneer institution in the scientific development and dissemination of fire safety, defines Fire Protection Engineering as "the application of engineering principles to prevent and mitigate the unwanted impact of fire" (SFPE, 2018, p. 3). Table 1 contains the technical skills that a fire protection engineer should have according to the same organization (SFPE, 2018, p. 9).

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Table 1. Technical competencies and knowledge areas for the professional practice of Fire Protection Engineering, FPE

Minimum Competency	*Fire Science*	*Human Behavior and Evacuation*	*Fire Protection Systems*	*Fire Protection Analysis*
Knowledge Areas	Heat Transfer Fire Chemistry Fire Dynamics	Human Behavior and Physiological Response to Fire Egress and Life Safety Design Concepts	Passive Systems Active Systems Fire Detection and Alarm Fire Suppression	Performance-based Design Smoke Management Evacuation Analysis Structural Fire Protection Risk Management Numerical Methods and Computer Fire Modelling Building and Fire Regulation & Standards

As it can be appreciated, Fire Protection Engineering is a very complex field, which integrates diverse aspects, such as the physics of fire and its performance in buildings, human behavior, or risk analysis. Regarding Fire Safety (FS) in buildings, in which this paper is focused, there is an interaction between the building, its occupants and the destructive fire (Figure 1). This means that predicting how a fire is going to affect a building and its occupants deals with uncertainty and needs very different skills and the use of predictive methods.

Probably because there is an inertia of the traditional role of the Architect in the building process, Architectural education in Spain represents an exception in comparison to other countries. Many technical competencies are required in the university programs, being one of them the capacity to develop safety projects, evacuation, and protection of buildings (Ministry of Education, 2010).

Figure 1. Graphic scheme by B. Meacham
(https://meachamassociates.com)