

Chapter 3

Human Factors: An Authentic Learning Mobile Application Design Project in a Higher Education and Industry Context

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ABSTRACT

Human factors are integral to applied academic programs such as interaction design. In this chapter, the authors begin by reviewing precepts of authentic, “real-world” learning. From a human factors and interaction design viewpoint, they then describe an authentic learning project—a mobile application design—that was done by university students in collaboration with a leading global specialty retailer. Specifically, in terms of the project, the chapter reviews the following: 1) benefits and challenges of academic and industry collaborations; 2) human factors and interaction design processes, methods, and principles used throughout the authentic project; 3) anthropometric features of the project prototype and their implications for usability; 4) precepts of cognitive information processing (i.e., human attention, perception, and memory) and their importance for the design and usability of the project’s interface; 5) insights and lessons learned about the use of authentic learning experiences in teaching human factors and interaction design.

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INTRODUCTION

In today's information society where technology is pervasive, college and university graduates face a workforce characterized by rapid innovation, new and emergent industry practices and methods, as well as ongoing technology development. These forces stimulate new ways of working and communicating and alter business models, workflows, and entire industries. Workers must be adaptive to the challenges of this dynamic environment and capable of thinking critically about and solving complex and ill-defined problems.

In higher education, an enduring challenge in many academic disciplines has been providing students "real-world" learning experiences that immerse students in collaborative contexts, so they deliberate and ultimately address authentic problems. Applied disciplines such as architecture and design, engineering, computer science, and business tend to emphasize the congruence between what is taught in the classroom and what is occurring in professional practice. As academic programs face increased competition for students due to demographic shifts, persistent and rapid technological innovations, among other things, authentic learning and the necessity of connecting the higher educational classroom with professional practice becomes even more highlighted.

Generally, traditional teaching and learning approaches in higher education tend to be of the objectivist epistemology - lecture, objective tests, and learning experiences that are more content-and instructor-centric than learner centered – and detached from "real-world", authentic problem-solving. Universities have been criticized for not adequately preparing students for today's highly dynamic workforce and information society as they continue to embody instructional approaches based on objectivist's assumptions (Alt, 2015).

Conversely, in today's information society, the workforce requires individuals to quickly adapt to changing work demands and unforeseen challenges, work collaboratively, think critically, make reasoned decisions, and resolve fluid and ill-defined problems (Huq & Gilbert, 2017; Lee & Hannafin, 2016). Teaching and learning based solely on behavioral and cognitivist-inspired approaches may be inadequate. While they may be appropriate for many learning situations and content, educators and researchers also advocate for instructional approaches reflective of a constructivist epistemology. In fact, Elander and Cronje (2016, p.390) found that of the courses they evaluated, all integrated both objectivist and constructivist principles and they noted that, "...learning tasks tend to be constructivist by nature while the provision of information tends towards direct instruction." From a constructivist perspective, teaching is a means of helping learners construct meaning by providing them authentic learning experiences and guiding them through the meaning-making process. Constructivist approaches to teaching and learning emphasize that learners

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