Chapter 5
E-Learning Design from a "Quality of Experience" Perspective:
Heuristics and Case-Studies

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ABSTRACT

This chapter considers technology-enhanced educational activities spanning along a significant period of time, and explores this context from a "quality of experience" perspective. Rather than addressing the design of technology, interface, or interactive contents for learning, our main focus is the exploration of the process-oriented, affective, socio-contextual issues involved in the design of prolonged workflows of e-learning activities. We propose a set of heuristics for designing e-learning experiences that can maintain learners' engagement along the time and achieve durable, profound educational benefits in the educational context in which they take place, and are valuable for all involved stakeholders. We also pinpoint that involving learners as experience design partners is fundamental for these purposes. Our approach is exemplified by widely discussing two case studies that involve different technologies (shared 3D virtual worlds and online collaborative storytelling) in different educational contexts – high and primary schools.

INTRODUCTION

Many existing studies that investigate design issues in e-learning from a Human-Computer Interaction perspective focus on how the characteristics of technological tools - i.e., their contents, functionality, interface, or interaction paradigms - affect learning (Clayton et al., 1998).

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Still, e-learning technology per se may have a limited educational impact unless it is included in an epistemologically coherent educational "project" that redefines the teaching-learning, student-student, and student-technology relationships, turning learners (and instructors) into researchers who can experience a stimulating process of discovery and challenge, not only sporadically or episodically but also in the long term. Our work attempts to move beyond asking "How should we design

educational e-tools?" and rather explores how we can design *prolonged* e-learning *activities* in all their educational, emotional, socio-contextual characteristics. We propose a shift of focus - from the design of e-learning technology to the design of e-learning *experiences*, which focuses on the *use* of technology in real educational settings. We suggest that these aspects are equally important to be investigated as the actual characteristics of the adopted digital artifacts.

Hence we explore the concept of *quality of e-learning design* in terms of *quality of the e-learning experience,* defined as " how well a set of technology-enhanced activities serve their educational purposes, i.e., support the achievement of durable, profound educational benefits, how well they fits into the educational context in which technology is used, how pleasant and valuable they are for all involved stakeholders – learners, teachers, and families". We propose a set of heuristics for designing e-learning activities that require *prolonged engagement* of learners with technology in order to be educationally effective, and identify a number of factors that may contribute to maintain engagement. In particular, we propose that the participation of *learners as experience design partners* contributes to the quality of e-learning design, since this partnership potentially induces a number educational benefits. This view of learners in relationship to technology is relatively unexplored in HCI and in the e-learning literature, and its investigation represents a further novel contribution of our work.

The different heuristics are exemplified by widely discussing two case studies that involve different technologies (shared 3D virtual worlds and online collaborative storytelling) in two educational contexts – high and primary schools. We will highlight how the different heuristics have been applied in the design of these experiences, and the educational benefits we could measure on learners.

The rest of the paper is organized as follows. In the following section we frame our approach in the contexts of existing works in HCI and e-learning. Then we introduce our heuristics and the case studies. The conclusions pinpoint the critical aspects of our work and outline our future steps.

RATIONALE AND BACKGROUND

The term "*experience*" is associated to a wide range of concepts at different levels of abstraction and no cohesive theory of experience and experience design currently exists.

In Interaction Design, an experience is defined as the set of user-product interactions and all aspects of "experiencing" an interactive product – physical, sensual, emotional, social, and aesthetic (Marcus 2002, Norman 2004, McClennan 2005). A number of works attempt to indentify the factors that contribute to the "quality of experience", broadly defined as " how well a product serves its purposes, how well it fits into the entire context in which it is used, how pleasant and valuable it is for its users" (Alben 1996). Still, most of these works focus on "short experiences", which involve sporadic or episodic interactions for short periods of time. For this kind of experiences, quality is defined in terms of various design attributes, such as aesthetics of the interface (Austin 2000, Dalsgård & Halskov 2006, Desmet 2006, Norman 2004, Alben 1996) and usability of lay-out, information architecture, or task flow (Garret 2002).

Short experiences may be effective to achieve narrow educational benefits, mainly at the knowledge and skill levels in the Bloom taxonomy (Bloom 1964). Still, they can hardly support more profound forms of learning aimed at developing complex attitudes and skills at in the intellectual, emotional, or ethical sphere and at achieving durable educational effects that endures after the digital experience. This form of e-learning, which is the main focus of our educational research, requires time and involves the *use of a digital artifact over a prolonged period of time* (weeks or months) and a (possibly complex) *workflow of*