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Chapter XI

Educational Theory Into Practice Software (ETIPS)

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Abstract

The ETIPS software is a Web-based learning environment that delivers cases that allow educators to practice instructional decision making. Here I recount its development but mainly emphasize the two key concepts that were central to our design process. The first was the Conceptual Assessment Framework, an evidentiary reasoning and design perspective that helped us to focus on which key attributes to build into the software and cases. The second concept is described as extreme programming, which is an iterative approach to software programming based upon user stories and rapid prototyping. The story of developing the ETIPS cases illustrates the need to know very clearly what the point is of the educational experience you are creating and to design software where form follows function.

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Introduction

In this chapter I recount the important aspects of the creation of the ETIPS software and its cases but mainly emphasize the two key concepts that were central to our design process. The first was the *Conceptual Assessment Framework*, developed by Mislevy, Steinberg, Almond, Haertel, and Penuel (2001); this framework helped us to focus on which key attributes to build into the software and cases. The second concept is described as extreme programming (Beck & Fowler, 2000), which is an iterative approach to software programming based upon user stories and rapid prototyping.

The story of developing the ETIPS cases illustrates the need to know very clearly what the point is of the educational experience you are creating and to design software where form follows function. The first generation of ETIPS cases was created with existing case-authoring software; halfway through this four-year project our team realized that this software constrained the sort of learning experience we wanted the cases to provide. During the project's third year we began to create from scratch software for a second generation of cases and an interface that brought to fruition our case-based pedagogical approach. We used the *Conceptual Assessment Framework* (Mislevy et al., 2001) to guide the development and refinement of each user story for the software; this helped us to connect form to function in the second generation of software and to recognize how our case-based pedagogy could be used with other topic areas as well. Thus, a side benefit of using these conceptual approaches was that we increased our product's sustainability through broader user bases, potential co-authoring partnerships, and licensing.

Educational Purpose of the Cases

The purpose of the ETIPS project was to create teacher education cases that were learning exercises about educational technology integration and implementation. The primary audience for our cases was pre-service teacher education classes on either educational technology or pedagogical methods. Key premises upon which we based the software for our second generation of cases were that teaching is decision making—and decision making is a process that can be taught and requires practice in order to learn—and that instructional decisions are guided by schemas, or mental models.

The cases allowed students studying to be teachers to practice making instructional decisions about educational technology use in classrooms and schools using the Educational Technology Integration and Implementation Principles as a schema, or the basis of a schema, for those decisions. By providing instructors nine virtual yet realistic schools among which to choose to set these decision-making exercises in it allowed them to give their students multiple practice opportunities to see how these principles can guide instructional decision making about technology integration and implementation in a variety of school contexts.

The six principles summarize what research suggests are the conditions that should be present in order for educational technology integration and implementation to be effective (Dexter, 2002). The first three educational technology principles focus on integration, mean-

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