Chapter XLII
Supporting Decision Making in Using Design Languages for Learning Designs and Learning Objects

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ABSTRACT

In developing modern instructional software, learning designs are used to formalize descriptions of roles, activities, constraints, and several other instructional design aspects and learning objects are used to implement those learning designs in instructional software. Central in both constructs is the use of design languages to support structuring a design task and conceiving solutions. Due to a lack of standardized design languages that are shared between designers, producers, and other stakeholders, the application of learning designs and learning objects is often unsatisfactory for three reasons: (a) different instructional and technical structures are often not meaningfully organized; (b) different levels of detail are mixed together; and (c) different expressions are used in a nonstandardized manner. A decision model is introduced—the 3D-model—that supports better selection and application of design languages. Two studies show that the 3D-model contributes to a better information transition between instructional designers and software producers.

INTRODUCTION

Developing instructional software is becoming increasingly complex. Besides many recent *pedagogical innovations* such as holistic whole-task approaches as found in case-based learning or problem-based learning (van Merriënboer & Kirschner, 2007), developers have to pay attention to recent *technical innovations* as well. Amongst others, recent technical efforts are directed at modularization, reusability, and interoperability (Parrish, 2004). Finally, *organizational innovations* that emphasis the integration of working and learning by means of blended combinations of face-to-face learning, distance learning, and on-the-job learning (Cantoni & Botturi, 2005; Jochems, van Merriënboer, & Koper, 2004) complicate the situation even more. As a result, developing modern instructional software requires often iterative development processes and prototype-testing, involving multidisciplinary teams with many different members, including managers, producers, instructors, and subject matter experts (Bates, 1999; Botturi, Cantoni, Lepori, & Tardini, 2006).

In many cases, instructional designers are placed in charge of the instructional design and of managing the subsequent development process. They face the challenge of negotiating and communicating this design, with all its pedagogical, technical, and organizational implications, to all of the stakeholders, who often have a different

Table 1. Concerns of different stakeholders in the ISD process

Kind of stakeholders	*Types of Stakeholder Activities*	*Examples of Concerns*
Project Leader	Manage the whole ISD process	Optimal transfer of information and product during the ISD process
Subject Matter Experts	Validate the domain content	Impact on work floor
Instructors	Validate the didactical model	Impact of instructional design on their teaching (e.g., classroom based, coaching in practice)
Managers	Approve the instructional design	Impact of instructional design on their organization (e.g., financial, roles, infrastructure)
Producers	Translate instructional design into technical specifications (often conduct their own type of analysis and design)	Impact of instructional design on production process (e.g., selection of tools and media, programming, interfacing, usability)
Implementers	Use the instructional design as guidelines	Impact of instructional design on infrastructure, roles, school management, etc.
Learners	Participate in usability studies, interface design studies, and other formative evaluation activities.	Personal preferences and impact of instructional design on their learning processes
Evaluators	Use the objectives set in the instructional design as evaluation criteria	Impact of instructional design on assessment process

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