Chapter VII
Patterns and Pattern Languages in Educational Design

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ABSTRACT

This chapter provides an overview of recent research and development (R&D) activity in the area of educational design patterns and pattern languages. It provides a context for evaluating this line of R&D by sketching an account of the practice of educational design, highlighting some of its difficulties and the ways in which design patterns and other aids to design might play a role. It foregrounds a tension between optimising design performance and supporting the evolution of design expertise. The chapter provides examples of recent research by the authors on design patterns for networked learning, as well as pointers to complementary research by others. Connections are made with R&D work on learning design and other approaches to supporting design activity.

INTRODUCTION

Slowly but steadily, the core concerns of teaching are moving from the exposition of content to the design of worthwhile learning tasks. The nature and causes of this shift are contested, but one strong driving force is the changing nature of employment: the replacement of unskilled and semiskilled routine work with work that demands flexibility, creativity, and specialist knowledge. The volatility of employment and of the labour market combined with the strengthening of ideologies locate responsibility for learning and skills development firmly with the individual, to create a climate in which capacities for lifelong learning become crucial. Constructivist pedagogies, which centre on learners' involvement in actively constructing their own knowledge, are coming

into alignment with capitalism's paradoxical need for more autonomous learners (Longworth, 1995; Stewart, 1998; Urry, 2003). Neither radical constructivism, nor classic instructional design, are much help to the teacher who needs to design tasks that challenge learners to take an active part in knowledge construction (Goodyear, 2000).

Educational design is complex and challenging. Empirical research suggests that teachers at all levels of education find it difficult and that the outcomes are often unsatisfactory (Bennett, Desforges, Cockburn, & Wilkinson, 1984; Hoogveld, Paas, Jochems, & van Merrienboer, 2002; Kirschner, Carr, van Merrienboer, & Sloep, 2002). There have been several lines of response to this problem. One approach has been to provide teachers with computer-based tools that are intended to provide support for their design activity (see, e.g., Elen, 1998; Goodyear, 1997; McAndrew, Goodyear, & Dalziel, 2006; Pirolli, 1991; Spector, Polson, & Muraida, 1993). In general, these tools are meant to carry some of the cognitive load entailed in solving complex design problems. In principle, this allows teacher-users to concentrate on what they know best, while delegating other parts of the design work to the computer. The sharing of load happens in various ways. In some cases, the tool manages the overall structuring of the design task, leading teachers step-by-step down a design path and asking them to fill in details. In other cases, teachers provide an overall logic or general specification for a design, and the computer does the detailed tactical work of sequencing or helps locate relevant units of learning material or learning objects (Barrese, Calabro, Cozza, Gallo, & Tisato, 1992; Goodyear, 1994; Gustafson, 2002; McAndrew et al., 2006). In many cases, the underpinning philosophy (implicit or explicit) is to support performance rather than understanding. That is, the primary goal of most of these approaches is to improve the outcome of the teacher-user's current educational design task. If the teachers also learn something that will help them improve as an educational designer that is

seen as a useful by-product. When performance improvement is the primary goal, the teachers and the evolution of their understanding of design take second place.

The approach we summarise in this chapter embodies different values. We do not undervalue improving the performance of teachers on educational design tasks. However, we do value the growth of the teacher's personal understanding of educational design. We are looking for ways of supporting both understanding and performance, striking a good balance between the two. The approach we describe here gives a central place to educational design patterns and pattern languages. Our aim is to provide an introduction to this way of framing educational design and to summarise key ideas and achievements in the literature. Space limitations prevent us from giving many examples of educational design patterns, but we will provide some illustrative examples from our own recent work on design patterns for networked (collaborative online) learning in higher education. The reference list provides pointers to much of the literature on educational design patterns, particularly where the work relates closely to learning with the aid of technology. In the next section, we provide an introduction to design patterns, their origins and recent evolution and give some suggestions about useful supplementary literature on their use in education. After that, we summarise some aspects of our own recent work on design patterns for networked learning. The chapter concludes with some thoughts about promising lines of research and development work.

BACKGROUND

Learning Activity and Educational Design

We use the term 'educational design' to mean the set of practices involved in constructing

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