E-Learning by Design

Teachers as Learners: Embedded Tools for Implementing a CMS

By Betty Collis and Wim De Boer

"The universe is full of magical things, patiently waiting for our wits to grow sharper."  Eden Phillpotts  English science-fiction writer  1862 - 1960

In the past few months, my wits have grown sharper thanks to Dr. Betty Collis and the reach of technology. Imagine: you write an e-mail inquiry to an accomplished woman living thousands of miles distant, and it grows into a valuable educational experience.

This column is a continuation of Collis’ interview in the September/October issue of TechTrends. Her innovative approach to applying technology to education, and training to faculty, brought me to ask her if she would guest-write this column and let me get out of her way. Her abstract was the perfect lead and rationale to read on, and I hope you agree. Thank you, Betty (and Wim!).

Joe Landsberger

Abstract

Teachers in higher education throughout the world are making use of course-management systems (CMS) to support their courses. None of these teachers grew up with using a CMS; they must themselves learn how to use them effectively at the same time that they are using them with their students. While institutions commonly provide some sort of introductory workshop for CMS use, these workshops have limitations in terms of their transfer value into practice. In this paper we discuss an example of embedded just-in-time support within the CMS itself to help teachers learn how to use a CMS efficiently but also so that both they and their students can take on new roles in the learning process.

A new form of computer-based support for teaching and learning has emerged since the late 1990s. It is a system of integrated tools that makes use of both database and web functionalities in order to make a web environment available to support a course or learning event. One name for such a system is a course-management system (CMS). Course-management systems are new tools for teachers and thus teachers must learn how to use them in a technical sense as well as in a meaningful sense. By meaningful, we mean not only to increase the efficiency of participating in a course but also to enrich and extend learning processes.

While most off-the-shelf CMSs do not allow much opportunity for tailoring their products to build in such support for teachers as learners, we have taken advantage of the fact that we built our own CMS at the University of Twente to offer teachers tools for their own learning integrated within the CMS system. In this article we discuss two major learning curves for teachers when using a CMS. The first is learning to set up and manage a web environment that best fits their own course and their own students. The second is learning to design and support new types of learning activities where both students and the teacher take on new roles. For each of these, we will show the sorts of built-in teacher support that have helped us in implementing our CMS throughout our university (and also, throughout other settings including other higher-education settings in a number of countries, corporate learning, a military college and even secondary and elementary schools). Although our focus will be on various tools within the CMS itself, we will emphasize that technology will have little impact in practice without accompanying institutional support and a clear motivation for the teacher for using the technology.

Course-management systems

A web-based course-management system is a comprehensive software package that supports some or all aspects of course preparation, delivery, communication, participation and interaction and allows these aspects to be accessible via a network. The term “web-based course-management system” is not yet fixed: many different terms are also used, some of these metaphorical, such as “course in a box” or “virtual university;” some more informative, such as “electronic learning environments,” “virtual learning environments,” “course-support systems,” or “online educational delivery applications.” Just as the name is not yet fixed, neither are the possible components. Student tools can relate to web browsing, sharing and archiving of resources and work products, synchronous and asynchronous communication and collaboration, self-assessment and personal environments such as biography pages and digital portfolios. Teacher tools can include tools for course plan-
helping, managing and customizing; for lesson design and presentation; for managing assignments, feedback and (online) marking, as well as maintaining overall marks and records of student performance; and for creation, management and reuse of resources. All of these tools are generally made available via a uniform web-based user interface. The “back-office” aspects of the system most commonly involve a combination of a database, database technology and an HTTP server (the type of computer software that allows a computer to perform as a web server). Some variety of tools and templates integrate the user interfaces with the back-office functionalities. The templates, when used with database-driven systems, allow the user to upload or enter information into the system via form-like entries, and then see a view of what is in the database. (For a comprehensive overview, see http://www.edutools.info/course/index.jsp).

Helping teachers learn to use a CMS efficiently and effectively

Regardless of the combination of features available in the CMS, teachers must learn to use the system efficiently and effectively. Any learning process should reflect basic learning and instructional principles. In this section, one such set of general principles is described and expanded for the particular case of teachers learning how to use a CMS. Following from this, the case for embedded tools to support teachers’ learning about how to use a CMS is briefly presented. Then examples from our own practice are described.

General principles

Merrill’s “first principles of instruction” (2002) form a solid basis for any adult learning situation. From a meta-review of major instructional theories and models, Merrill identified the following five key principles that form a core basis for designing instruction: "Learning is facilitated when:"

1. Learners are engaged in solving real-world problems
2. Existing knowledge is activated as a foundation for new knowledge
3. New knowledge is demonstrated to the learner
4. New knowledge is applied
5. New knowledge is integrated into the learner’s world (pp. 44-45)

Applying this to the case of teachers learning to use a CMS leads to the following tailoring of Merrill’s first principles. Learning to use a CMS is facilitated when:

1. The teacher learns while doing, learning while setting up and managing his or her own course environment that runs within the CMS.
2. The learning starts where the teacher is, offering entry points that directly correspond to what the teacher is familiar and comfortable with, but also showing new possibilities.
3. How to set up and use the CMS is directly demonstrated to the teacher as he or she is learning. Examples from other teachers in the same institution can be examined easily.
4. The teacher applies what is being learned directly to the set up, maintenance, and revision of his or her own course web environment, also allowing that he or she can make changes in the course environment at any time to accommodate new learning.
5. The product of the learning is immediately put to use with learners. In addition, successful uses of the CMS can be shared with other teachers and can be reused by the original teacher in a direct and simple manner.

Embedding tools within a CMS

The above principles lead to the idea of embedded tools within the CMS for teachers to help them learn how to use a CMS efficiently and effectively and in a manner that is directly linked to practice. Another important reason for embedding tools for just-in-time learning is that teachers have the constant problem of finding adequate time for learning about the use of a CMS. Lack of time is a major reason why teachers do not attend workshops on how to use a CMS (Verstelle & Benthem, 2002).

With just-in-time teaching provided through embedded tools, teachers learn as much as they need, when they need to apply that learning.

How can this work in practice? The following section gives an example from our own institution.

An example of embedded tools for teacher learning

This section will start with an overview of three generations of tools embedded within a CMS for teacher support and learning that we have designed and implemented over the period 1997-2004. The structure and main components of the current set of tools are described, and examples of some of the primary components and their functional design follow.

The TeleTOP CMS

In 1997 the Faculty of Educational Science and Technology at the University of Twente decided to redesign their approach to program delivery so that all students could have options for more flexible participation in learning. This was not be translated as setting up a type of distance education, but rather offering learners a variety of choices within each course. These choices related not only to place and time of different learning activities but also to variety in terms of learning resources, activities and assessment procedures. A team was established to lead the process of redesign of the educational program. An educational approach emphasizing learner contributions, collaborative learning and participation via the use of the web was developed as an alternative to classroom lectures in order to add more scope for flexibility and learner engagement (Collis & Moonen, 2001, gives a full description of the “contributing student” approach and its educational motivations). The team, the approach and the project were called TeleTOP, and the first author was the team leader. We established a set of eight requirements that we needed from a CMS to support the intertwined goals of offering more flexibility to learners and also supporting a