Web-Based Course Development Tools

Hui-Ling Wu
Texas A&M University, USA

INTRODUCTION

Web-based course development tools are software programs that facilitate the creation of online instructional material. These tools have become increasingly important in recent years; advances in technology have made e-learning more popular, but have done so without a parallel rise in the technological proficiency of educators attempting to design online courses. The conveniences of many web-based course development tools remove this problem, and the many types of applications currently in use have broadened the range of functions available to designers. This entry will discuss the major online course development tool innovations that have occurred in the recent years, the types of tools that are in common use among developers today, and the ways in which these tools may be utilized.

BACKGROUND

Challenges of Online Instructional Development

Some years ago, e-learning was a new term for many people. Yet in recent years, distance education has changed dramatically from being non-technological to technology-supported and, finally, to technology-based. Numerous applications facilitating the development of e-learning now exist; estimates suggest that more than 250 commercial Learning Management Systems (LMS) are currently available (Carabaneanu, Trandafir, & Mierlus-Mazilu, 2006). Although the rapid development of technology has promoted the diversification of e-learning applications, it has also created new challenges for educators and instructional designers.

The lack of pedagogical consideration of early web-based instructional tools inspired much criticism of these products (Bonk & Dennen, 2003). Some scholars (Gregory & Glenda, 1998) point out that the educational experiences of most higher education instructors did not include discussions of learning theories, thus jeop-ardizing the effectiveness of the web-based lessons these instructors develop. Moreover, even if instructors are familiar with learning theories, they often lack the technological skills necessary to create effective web-based instructional materials (Chou & Tsai, 2002; Koehler, Mishr, Hershey, & Peruski, 2004). Caplan (2001) argues that an online course development team should have the ability to fill five major roles: subject matter expert, graphic designer, instructional designer, web developer, and programmer. The difficulty of addressing such new challenges gave rise to online course development tools, which helps instructors lacking technical expertise to create web-based courses.

Researchers recognize that instructors may have to expend significantly more time and effort to adapt their traditional classroom teaching styles to an online environment. Compared with traditional course instructors, online instructors must spend more time designing and developing new courses (Haugen, LaBarre, & Melrose, 2001), though they require less time to prepare for courses that have already been developed (Conceicao, 2006). DiBiase (2000) contends that the effectiveness and efficiency of an online course is related to "the amount, and the quality, of the instructional design and development effort that produced it" (p.19), thus emphasizing the need for more convenient e-learning development tools to facilitate this process.

In addition to the above challenges, those who wish to use these tools must consider whether systems produced by different vendors are compatible in terms of supporting web-based materials, and they must also be knowledgeable about the storage and accessibility of content in older formats.

Online Learning Standards

Researchers have developed a variety of standards, specifications and reference models that help developers create online learning materials efficiently. A common element of these items are *learning objects*, reusable standardized digital resources that instructors

can readily adapt to suit the needs of their individual courses; they are often composed of discrete lessons, units, or courses (McGreal & Elliott, 2004). Definitions of learning objects vary. Downs (2001) emphasizes the technological functions of learning objects such as accessibility, reusability and adaptability, whereas others stress the significance of learning objects for "enhancing, amplifying, and guiding the cognitive processes of learners" (Kay & Knacck, 2007, p. 6).

Forth and Childs (2003) define e-learning standards as the collections of actual standards, specifications, reference models and best practices for defining "how learning and learning resources are described, structured and how they work together" (p.2). Standards began to form when a variety of organizations, among them IMS Global Learning Consortium and the Aviations Industry CBT Committee (AICC), jointly proposed e-learning specifications based on their needs. For instance, the specifications for IMS Content Packaging include learning objects, information about forming larger units, and rules for delivering content. Next, these organizations tested new products which incorporated these specifications, and developed reference models to validate the incorporation of different specifications in e-learning environments. Of these reference models, SCORM (Sharable Content Object Reference Model) is among the most widely recognized in the e-learning market. SCORM determines the content of standardized learning objects which can be reused in different environments, especially in learning management systems (LMS). Finally, specifications which have undergone testing and validation are accredited as standards after refinement, clarification, and consolidation by official standard-setting bodies. These groups include the IEEE (*Institute of Electrical and Electronics Engineers*) Learning Technology Standards Committee and the ISO/IEC Joint Technology Committee Subcommittee on Standards for Learning Education and Technology.

In order to make the process of sifting through the numerous available learning objects as convenient as possible, researchers developed *learning object metadata* (LOM) to provide brief information regarding the content of each learning object. IEEE defined LOM as containing information regarding the content (title, description, keywords), ownership, expense, technical requirements, and educational objectives of learning objects (Godwin-Jones, 2004). The use of Metadata, thus, helps instructors search for, transfer, and reuse

data. In recent years, IEEE has learned how to utilize extensible markup language (XML), a web-authoring language, to create LOM. In addition to XML, other e-learning standards have emerged such as design standards (Cascading Style Sheets) and metadata standards (XHTML). Standardizations make it easy for diverse systems to reuse learning objects. Thus, instead of expending much time creating new materials, designers and developers seek already-available resources which are compatible with their specific systems. Despite these advantages, Kramer and Schmidt (2001) point out that learning standards do not provide sufficient information regarding pedagogy, such as capabilities, skills and knowledge.

WEB-BASED COURSE DEVELOPMENT TOOLS

The numerous applications that have emerged in the educational and corporate sectors as a result of advances in technology have caused a rapid increase in the number of web-based course development tools. These tools fall under three major categories: HTML editors, multimedia authoring applications, and rapid e-learning software.

HTML Editors

Traditionally, web developers have had to write HTML code in a Notepad (pure text) document in order to create web pages. However the emergence of HTML editors made using HTML tags easier. There are two common forms of HTML editors: text and WYSIWYG (What You See Is What You Get). Text editors with shortcut features offer users a convenient way to code web pages. Though text editors follow no standardized format, many contain such features as syntax highlighting, auto indentation, and bracket matching. Despite their ease of use, text editors require developers to have a technical understanding of scripting languages. With the emergence of WYSIWYG editing tools, however, programs now generate HTML code automatically. In this respect, WYSIWYG tools are similar to those in desktop publishing software in which web developers visually position elements in a page layout and the program simultaneously produces the corresponding code. Developers can therefore edit web pages without significant Web programming knowledge. Some good

Related Content

Leveraging Content Creation to Boost Student Engagement
Michael Cohen (2022). *Designing Effective Distance and Blended Learning Environments in K-12 (pp. 223-239).*
www.irma-international.org/chapter/leveraging-content-creation-to-boost-student-engagement/292182

Teaching Java: Managing Instructional Tactics to Optimize Student Learning
Henry H. Emurian (2007). *International Journal of Information and Communication Technology Education (pp. 34-49).*
www.irma-international.org/article/teaching-java-managing-instructional-tactics/2328

Detection of Misconceptions and Misleading Questions by Using Quantitative Diagnostic Assessment
Martin M. Weng, Wen-Chih Chang, Neil Y. Yen, Timothy K. Shihand Hui-Huang Hsu (2014). *International Journal of Distance Education Technologies (pp. 26-50).*
www.irma-international.org/article/detection-of-misconceptions-and-misleading-questions-by-using-quantitative-diagnostic-assessment/113978

ePortfolios and Technology: Customized for Careers
Eleanor J. Flanigan (2012). *International Journal of Information and Communication Technology Education (pp. 29-37).*
www.irma-international.org/article/eportfolios-technology-customized-careers/70916

A Context-Aware Self-Adaptive Fractal Based Generalized Pedagogical Agent Framework for Mobile Learning
Soufiane Boulehouache, Ramdane Maamriand Zaidi Sahnoun (2015). *International Journal of Distance Education Technologies (pp. 1-28).*
www.irma-international.org/article/a-context-aware-self-adaptive-fractal-based-generalized-pedagogical-agent-framework-for-mobile-learning/133241