

Chapter XXIII

Web 2.0 Technologies as Cognitive Tools of the New Media Age

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ABSTRACT

Web 2.0 affordances have changed the landscape of technology use for learning, knowledge construction, and collaboration important for K-12 learner literacy. This chapter introduces web 2.0 technologies, including folksonomy, collaborative writing tools such as wikis, and weblogging, as cognitive tools that can support learning of content, metacognitive activity, and self-regulation (SR) at the K-12 level. Recent conceptual and empirical research is reviewed to support the use of these technologies. Application scenarios are provided to elaborate on how the technologies can be incorporated into teaching. Design and implementation implications, and a discussion of issues and challenges are included throughout for teachers, practitioners, and researchers interested in adopting these new media in the school setting.

INTRODUCTION: EVOLUTION OF THE WORLD WIDE WEB IN EDUCATION

In the new media age, an individual's capability of using emerging information and communication

technologies (ICTs) opens unlimited possibilities for efficient and enriched living. Among those ICTs are hardware (e.g., personal computers, digital cameras and camcorders, mobile phones, and PDAs), software (e.g., Word, PowerPoint, and Excel) and Web applications (those unique

extensions of software residing on the Web). While the authors recognize the importance of computer hardware and software literacy under a traditional conceptualization, this chapter focuses on the literacy of new Web applications, that is, Web 2.0 technologies, at the K-12 level.

Netcraft Ltd. (2006) found more than 100 million websites as of November 2006. That number continues to grow. The evolution of Web use in education, to a great degree, matched the development of the early Web, namely, evolving from a place to find information, to a *searchable* repository where information was easily found and integrated into traditional lesson plans. Teachers used the early Web to gain access to the vast array of information from databases, historical and current events, images and sounds. Also accessible were experts, colleagues or collaborators (Grabowski, Koszalka, & McCarthy, 2007), through exchanges that are now deemed rudimentary —i.e., e-mail, chat, listservs. The Web was an efficient repository of information; but the Web as depository for teachers was mostly out of reach, save for the relatively few with Web creation skill or support.

The literature suggests that various factors influence teachers' use of ICT for teaching and learning, including teachers' technical capabilities (e.g., computer and Internet skills (Becker, 2001)), self-efficacy (Markauskaite, 2007), pedagogical beliefs (Becker, 1999; Ertmer, 2005), and personal experience with the technology (Ertmer, 2005), to name a few. Among these factors, teachers' technical capability was the fundamental predictor for any technology to be integrated in the classroom. That is, only after much hands-on practice will teachers start to feel confident about and consider adopting high level use of the technology with their students. This means that for a technology that requires complex skills and has a long and steep learning curve, teachers are less likely to develop the confidence they need to adopt it. With the old Web, different levels of technical capabilities were required for different levels of integra-

tion. Most teachers were capable of using the old Web passively for information searching and retrieval. However, if teachers wished to actively participate in creating and sharing knowledge on the old Web, it was necessary for them to possess advanced technical skills, such as Web authoring, and server and database management skills. These required skill sets were complicated and required teachers to invest a considerable amount of their valuable time learning technical nuances and troubleshooting technical problems. Fortunately, the new-generation of Web technologies have lowered the technical threshold required of teachers and allow for relatively easy learning, thereby increasing the probability that teachers will adopt Web use to support higher levels of learning afforded by contemporary teaching methods.

BACKGROUND: THE SPIRIT AND CHARACTERISTICS OF WEB 2.0

With the emergence of a new generation of Web technologies, a different model conceptualizing the Web materialized. The new model transforms the Web from a repository/depository space of information into a collaborative space enabling proactive and participatory use. The concept marks the transition of the Web from the “Web-as-information-source” to the “participatory Web,” encouraging user participation, creation, and sharing, beyond simple retrieval of information (Decrem, 2006; Wikipedia, 2007e). The new Web has, therefore, morphed from an individual's toolbox to a societal sandbox. Dale Dougherty, Web pioneer and O'Reilly Vice President in 2004 (O'Reilly, 2005) coined the phrase *Web 2.0* for this new Web. Common terms of the new generation of Web technologies include wikis, Weblogs, folksonomy (i.e., tagging), podcasts, RSS (Really Simple Syndication) feeds, etc. (O'Reilly, 2005; Wikipedia, 2007e).

The concept behind Web 2.0 signifies collective and cooperative creation of content and

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