

Chapter 2

Web Advances in Education: Interactive, Collaborative Learning via Web 2.0

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ABSTRACT

The evolving shift from ‘teaching’ to ‘learning’ in contemporary education is strongly related to an increasing involvement of information and communication technologies and the Web. Although the latter was initially of a static nature and merely required passive human viewers, this is currently changing towards a second generation of dynamic services and communication tools that emphasize on peer-to-peer collaboration, contributing, and sharing, both among humans and programs. In this chapter, this revolution, usually known under the collective term Web 2.0, is reviewed from an educational as well as a technological point of view. The issues and controversies arising are backed up by case studies from diverse educational contexts to illustrate the potential of the proposed solutions. The discussion is finally concluded with some exciting speculations on the envisaged arrival of Web 3.0 and collaborative content sharing with semantic technologies.

INTRODUCTION

Traditional education requires students at any level to sit through hours of lectures, and read through entire volumes of textbooks. However, advances in the understanding of learning processes suggest that such techniques may be suboptimal, and that

learning should evolve from ‘learning by acquisition’ to ‘learning by participation’. Thus alternative learning approaches build on concepts of active learning, defined as the process of having students engage in some activity that makes them reflect upon ideas and how they are using these ideas. Such new educational approaches require students to regularly assess their skills and knowledge at handling real world problems. Some student centered, active

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learning approaches include problem-based or case-based learning, inquiry and discovery based learning, role and game playing based learning, as well as collaborative and interactive learning of all kinds. Such approaches rely on situational learning and are active, self-directed, student-centered, and experiential. Their aim is also to develop problem-processing skills, self-directed learning skills and group competence. Learning is thus regarded to address two types of knowledge: explicit knowledge (conveyed by books, lectures and scientific documents) and tacit knowledge (directly related to experience and practice, as shared by interaction and collaboration).

This evolving shift from 'teaching' to 'learning' in contemporary education is also strongly related to an increasing involvement of information and communication technology. There is currently an international trend to involve computers and the Internet in formal education as well as in continuing life-long learning. This practice is reinforced by active support and funding from bodies such as the European Union and local governments. Specifically, the European Council in its Lisbon meeting in March 2000 set forth the European policy for an information and knowledge-based society, stressing the need to encompass the emerging technological revolution and change in the exchange of knowledge affecting all institutions and various aspects of the society (European Council, 2000).

Like many other cognitive domains, education can be considered in terms of levels of increasing complexity and importance: information (i.e. processed data and simple facts), knowledge (i.e. information with a purpose), and understanding (i.e. conscious knowledge, achievement of explanation and grasp of reasonableness), which leads eventually to ability, competence and professionalism (Ehlers, 2007). Technology has been employed in diverse ways to support different levels of the educational process, and especially conventional instructional teaching. Structuring

and organizing information with a particular educational purpose refers to knowledge. On the other hand, understanding implies experience as well as inquiring. Managing and supporting these levels of the educational process is a rather complex issue. Although technology and the Web in particular have been extensively used to support conventional education, new active learning approaches that emphasize on active learning, participation, and competence have been less supported. However, the emerging Web 2.0 paradigm gives the perfect opportunity, because of its mere nature.

Although Web 2.0 emphasizes on participation, in its early days in supporting learning it is still used in the majority of cases to hold and provide content (albeit created dynamically and via peer participation and collaboration) and then systematically deliver it to students. However, there are emergent applications of web 2.0 tools to implement and support active, collaborative educational episodes on the internet, creating virtual places for learners and experts to collaborate and explore and thus create new knowledge and expertise.

This chapter elaborates on the potential of Web 2.0 for active and, potentially, effective learning and reviews current practices and emerging advances in the field. The chapter also presents case studies of how web 2.0 technologies can be used in different educational settings to support conventional instruction and active learning in undergraduate, post-graduate and continuing medical education, as well as, a case study of using web 2.0 technologies to disseminate physics and astronomy to the public. Additionally, discussion addresses open research questions regarding the evaluation of the learner in terms of practical skills gained, e.g. critical searching, critical appraisal of literature, collaboration, etc. Finally, the potential benefit and envisaged merit upon merging with Web 3.0 technologies is also discussed.

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