

# STRATEGIES FOR THE IMPLEMENTATION OF WEB 2.0 TOOLS IN ACADEMIC EDUCATION

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## 1. INTRODUCTION

The use of Web 2.0 tools (wikis, blogs, RSS feed, collaborative writing, video sharing, social networks, etc.) can support innovative teaching methods and is associated with concepts like communities of practice, syndicated content, learning as a creative activity, peer-to-peer learning, the creation of personal learning environments, and non-formal education (Bartolomé, 2008). Such tools can be used to develop *Learning 2.0* strategies that can enhance student motivation, improve participation, facilitate learning and social skills, stimulate higher order cognitive skills, and increase self-directed learning (Redecker et al., 2009). A report on several European case studies indicates that the use of Web 2.0 tools has the potential for innovative active learning approaches, novel forms of blended learning scenarios, integration with social communities, collaborative creation / exchange of learning content, the introduction of diverse forms of communication, and the creation of personalized learner-centered environments like blogs and e-portfolios (Heid et al., 2009). Moreover, in the European context, the development and use of such applications and services create a considerable technological and economic potential (Lindmark, 2009).

The adoption of Web 2.0 tools at universities faces important challenges (potential risks, institutional fear) and so an effective strategy to deal with implementation problems may include learning from (others') experience, as well as open access to content and reliance on open platforms for knowledge sharing and creation (Freire, 2008). There are numerous models for the integration of Web 2.0 in higher education (Grosbeck, 2009) whose use has both considerable *advantages* (flexibility, e-learning activities, sharing of knowledge / experiences and resources, didactic innovation, etc.) and *disadvantages* (potential problems with technology and quality of content, limited security, diversity of technologies, etc.). In addition, there are indications that students perceive the *benefits* as well as the *difficulties* arising from the use of Web 2.0 tools in university courses in comparison with the use of traditional e-learning tools and classroom lectures (Kumar, 2009).

## 2. EDUWEB 2.0 PROJECT

The EduWeb 2.0 project ([http://e.foi.hr/iProjekt/index.php/Main\\_Page](http://e.foi.hr/iProjekt/index.php/Main_Page)) was performed from 2009 to 2011 with the general aim of creating digital content and services in the field of education to help determine new methods and procedures for the implementation of information and communication technology (ICT) to improve teaching processes. The specific goals of the project were to investigate the potential of the educational use of Web 2.0 technologies including social software such as wikis, blogs, and online community websites, as well as tools for various forms of creative expression: mind mapping, online block-diagrams, collaborative writing, online presentations, etc. The main idea was to evaluate numerous Web 2.0 tools with educational potential and to identify a number of online pedagogical activities that could be performed with the use of Web 2.0 tools. By February 2011, the outcomes of the EduWeb 2.0 project were: (1) evaluations of more than 40 Web 2.0 tools; (2) recommended online pedagogical activities with Web 2.0 tools and services; (3) workshops and lectures for teachers in Croatia; (4) case studies; and (5) scientific papers and conference presentations.

### **3. INNOVATION ASPECTS OF THE EDUWEB 2.0 PROJECT**

One goal of the EduWeb 2.0 project was to test different types of Web 2.0 tools in university courses. For this purpose, *online pedagogical activities* (e-tivities) were designed and tested in several hybrid courses. The variety of Web 2.0 tools used and the fact that some of the e-tivities were evaluated with a student survey reflect one of the innovative aspects of this project. Another innovation is related to the large number of Web 2.0 tools used in two courses. For the course "Computer-Mediated Communication" we found that students were able to develop competencies and effectively use for various purposes (diverse e-tivities) the following types of tools: blogs, wikis, e-portfolios, social bookmarking, online note taking, mind mapping, block-diagrams, video sharing and tagging, online cartoon strips, mockups, mashups, and online presentations. During the course "Data Structures" the students used a wiki and four different tools of each of the following categories: online note taking, mind mapping, block-diagrams, online presentations, and collaborative programming. We developed a novel approach to peer-to-peer learning for the courses "English Language I" and "Data Structures" since the students used multiple Web 2.0 tools to present numerous topics of the course in a wiki to support concept development and knowledge acquisition by their peers. Finally, the possibilities to use multiple Web 2.0 tools in combination with e-portfolio views and blog posts were investigated for the purpose of science promotion and popularization.

### **4. PEDAGOGICAL ASPECTS OF THE EDUWEB 2.0 PROJECT**

The pedagogical aspects of the EduWeb 2.0 project are associated with the design, implementation and evaluation of various online pedagogical activities in several university courses. More than 30 different e-tivities with a wiki were evaluated in teaching English as a second language, and so far 34 e-tivities of a general type are presented on the portal of the EduWeb 2.0 project. In addition, blog posts and e-portfolio views were evaluated as a means of presenting students' artifacts created with Web 2.0 tools, for keeping a diary of weekly course-related topics and activities, as well as for the assessment of the results of their work on various assignments. We also investigated the usefulness of online community websites (Ning, SocialGO) for small groups of students and analyzed the effects of their use on student motivation and socialization. Many of the Web 2.0 tools were evaluated not only for their usability but also for their pedagogical potential. Some of these results are presented as brief case studies on the EduWeb 2.0 project portal. Fostering collaborative and peer-to-peer learning, the enrichment of learning experiences and the development of ICT-related competencies were among the most notable effects of the use of Web 2.0 tools.

### **5. TECHNOLOGICAL ASPECTS OF THE EDUWEB 2.0 PROJECT**

Most of the Web 2.0 tools that were used and evaluated in the EduWeb 2.0 project were open-source or free of charge, web based and without the need to be downloaded or placed on a personal computer. The usability of 20 different Web 2.0 tools was tested with a comprehensive survey, and also a brief accessibility evaluation (server response time, help included on the tool's webpage, the possibility of changing the type or size of fonts in the tool) was performed for more than 30 Web 2.0 tools. The Web 2.0 tools with best usability were recommended. For most of the Web 2.0 tools used in various courses, a brief overview is presented on the EduWeb 2.0 portal with a list of *pros* and *cons* resulting from expert evaluation. Finally, the possibility to integrate and present student artifacts created with Web 2.0 tools was investigated in relation to the use of a wiki (MediaWiki), blog (WordPress), e-portfolio (Mahara), an online community website (Ning), and Moodle LMS.

### **6. USEFULNESS AND BENEFITS**

The benefits of the EduWeb 2.0 project were directly associated with the development of ICT skills of students and some other competencies as mentioned in the EU policy document "Key Competences for Lifelong Learning - A European Framework" (2006). We have developed case studies with survey evaluation and anecdotal evidence from students (i.e. Bubas et al., 2010a), presented the results of the EduWeb 2.0 project at a number of conferences and lectures (including EUNIS 2010, see: Bubas et al., 2010b), and performed 5 workshops. The EUNIS 2011 report on this project will describe various strategies that were used (or that have to be used) for the successful implementation of Web 2.0 tools in higher education.

## PROJECT WEBSITE

[http://e.foi.hr/iProjekt/index.php/Main\\_Page](http://e.foi.hr/iProjekt/index.php/Main_Page)

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