An Example of a Successful Inclusion of Teamwork and Web 2.0 Elements in Teaching Practice

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ABSTRACT

In this paper, the authors will demonstrate their experiences with the utilization of Web 2.0 elements in teaching computer science courses. The robust, reliable learning management solution the authors have employed for over a decade (Moodle) enabled them to integrate the typical building blocks of current social services and Internet communication in their common educational activities. Moreover, they conducted a number of surveys among both lecturers and students in order to draw inside information about the attitudes, feelings and thoughts of users of the mentioned services. On the general level, opinions are mostly positive within both groups of users, with slight variations regarding different services. Some of the offered possibilities are more appreciated, and used more willingly, while the rest of them are still considered only as a possibility, which suggests that the authors should provide more support and guidance to both their students and colleagues.

KEYWORDS

Computers in Education, E-Learning, Teamwork, Web 2.0, Wiki

INTRODUCTION

This paper presents the authors’ long-lasting experience in combining various; usually open source educational tools, as a way to introduce collaborative activities in teaching practice at the Department of Mathematics and Informatics, Faculty of Sciences, University of Novi Sad, Serbia. This effort was motivated by our belief that collaborative work helps the development of critical thinking skills and co-creation of knowledge and meaning. As a side-effect, we hoped that we will be able to add to the scientific research results, proving the claims in the current literature which agree with our viewpoint. At least in our case, the inclusion of collaborative activities in a course, in order to conduct small group projects or case study work for instance, makes a lot of sense. Collaborative learning is especially appropriate for many of the courses in our field (computer science), since they very often concentrate on the application of new knowledge to complex and unstructured tasks. Moreover, work practice leads to similar conclusions, as cleverly noted in (Benarek, Zuser, & Grechenig, 2005) where authors say that projects are performed by development teams, which commonly distribute the work among their members by following well-defined structures of interdependent responsibilities.

Most of the experiences that will be presented in this paper were gained through participation in a large educational project (Budimac et al., 2014) under the auspices of the “Pact for Stability of South-eastern Europe” and DAAD foundation. Within the project, 15 universities from 10 countries
created several joint courses, initially mostly in a classic face-to-face form. After that, each participating institution worked further on the adjustment of these courses to their individual needs, which in the case of our faculty meant the development of e-learning resources. Also, a follow-up project dealing with the design of joint master studies in the field of software engineering (Bothe et al., 2009) that are now conducted at several universities in our region was very helpful.

As a result we now have plenty of developed courses and e-resources. The most mature of them are courses: “Software Engineering,” “Introduction to e-Business,” “Object Oriented Programming 1 and 2,” “Data Structures and Algorithms 1 and 2,” and “Web Design” at the bachelor level; and in addition “Software Testing,” “Privacy, Ethics, and Social Responsibility,” “Architecture, Design, and Patterns,” and “Software Engineering for Critical Systems” at master level. Thus, these courses will be used throughout this paper as an illustration of our experiences and opinions about the subject. We ought to mention that we had significant help during the development of e-resources from our students attending an elective course on distance learning, as described in (Putnik et al., 2015).

At the very beginning of our e-learning, endeavours (Ivanović et al., 2009) we were certain that we wanted to use and, if needed, extend some of the existing e-learning platforms for our e-courses instead of developing a new one from scratch. After consulting a number of comparative studies and research papers (Al-Ajlan & Zedan, 2008; Ozkan & Koseler, 2009), and testing several (freely) available systems, we formed our set of conclusions on the available tools. The inclination was towards an open source solution, so the system we chose was one of the established general purpose learning management systems (LMSs) – Moodle. Its great flexibility and significant initial cost savings, together with the potential for extensibility and customization according to our particular needs were some of the factors that led our decision. Overview of the typical resources and activities that can be offered to students using only standard Moodle modules is presented in Figure 1.

Similarly to most of the novice practitioners of e-learning, over the years we progressed through several phases:

- Creating of repository of static reading materials;
- Development of e-lessons and teaching resources in an active, multimedia form;
- Creation of quizzes and glossaries of important terms and notions;
- Management of assignments (their submission and assessment);
- Simulation of classroom activities using chats and forums and finally
- Using Wikis for students’ joint work on team assignments.

Also, our interest in e-learning in general and advanced Moodle’s features in particular led us to take part in several educational and research projects in which we employed that LMS as the experimental educational space: bilateral project between Serbia and Slovenia (Ivanović et al., 2009), multilateral project with participants from Serbia, Czech Republic, and Greece (Ivanović et al., 2011), and additionally four smaller projects funded by international educational associations.

The rest of the paper is organized as follows. The second section shows current trends in the domain, especially the usage of collaborative learning and Web 2.0 technologies in teaching practice. In the third section, we present experiences collected at our faculty, together with some difficulties and challenges we faced while developing our courses and e-resources. Finally, in the last two sections we focus on declaring further research directions and stating valuable conclusions.
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