

Weblogging in computer science classes

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Abstract

This paper will present how weblogs, or web-based, chronologically-ordered, content management system, can be used as part of computer science classes. The experience consisted in having the class professor use a weblog for class-related topics, as well as anything mentioned in class that needed the complement of a hyperlink, and giving students the possibility of having their own weblogs, which had to be used compulsorily for self-test exercises, but could be used, in principle, for any topic. This experience has been running along the second semester of the 2003-2004 year, resulting in a very positive reaction by students.

Keywords

Innovation, weblogs, computer science, computer performance evaluation

1. INTRODUCTION

One of the biggest problems in computer science classes (and in general, in university-level teaching) is to get students really involved in them. Computer science curricula include many different classes, assignments, and exams, and every subject is as engaging as it the need the student has to pass them, but students need to pass most subjects, which makes most classes not very engaging.

New technologies often decrease involvement in class, by making most curricular material available on the web, and making the professor himself available via email or even phone; this means that, physically, the student does not need to participate in class at all in order to pass (or fail, for that matter) a subject. However, this finally implies that, even if the student manages to pass the test (of whatever way), he is bound to not learn much from whatever material he or she has used to pass it.

Higher involvement in class also means more channels of communication among students and professors, who then have more ways to evaluate him or her; continuous evaluation becomes a possibility, and, by becoming involved in class, a subject evolves from something static to a dynamic matter created jointly by a class and their professors.

Let us not forget human factors here. A class is generally a one-to-many unidirectional relationship, with most of the interaction among students having nothing to do with the subject itself. Our objective in this innovation project was to build a many-to-many relationship among students and professor, improve their acquisition of the class subjects, and create an engaging subject where students feel it is worth to participate and add their own ideas and information.

The subject we are applying our innovation project is called “Diseño y Evaluación de Configuraciones”, which more or less corresponds to Computer Performance Evaluation [1], a subject that deals with evaluation of computer systems (including software systems), identification of problems, and their solutions. The subject was already on-line: teaching material and practical classes descriptions were done on-line [2], and submission of assignments was also done in the same way. All students were included in a mailing list hosted at YahooGroups [3] that, besides being used for broadcasting messages, it was used for posting questions that could be answered by other students; YahooGroups also includes support for polls, which were used to ask the opinion of students in certain matters.

So, within the framework of a educational innovation project awarded by the University of Granada, we attempted to introduce weblogs in the classroom, as a new way of interaction between professor and students, and as a way of increasing collaboration and involvement of students in that computer science project.

Weblogs [4] are content management systems which make building and maintaining a chronologically ordered and archived website quite easy. Most weblog systems also include the possibility of commenting on entries made by the editors (and also its easy management), alternative formats such as the XML-based RSS [5](Real Simple Syndication), which eliminates all unnecessary webpage cruft, leaving just the newly published information in a format that is easily tractable (headlines, contents and dates are marked as such), and mechanisms such as *trackback* [6], which allow some weblog to warn other weblogs they are being hyperlinked from somewhere else, and *pings*, which are used to tell weblog directories and search engines that a new entry has been added to a weblog (see, for example, [7]).

However, weblogs are much more than that. Via a simple publishing mechanism and a culture that encourages linking, weblogs form a mesh where community feeling and self-consciousness is quite strong, and it is easy to find a group of people that has common interests. In fact, weblogs have increased threefold since last year in the Spanish community [8,9], and new hosting sites have arisen; this, combined with a certain media exposure (almost always naïve, and not always positive) has made weblogs a fashion adopted by many people. However, the project presented in this paper is an attempt to put the weblogs at work where they might have a good impact: among computer science students.

The rest of the paper is organized as follows: Next, we describe some work done with weblogs in the classroom, in a *state of the art* section. Then, in the *methods* section, we describe what was done to set up the project; *results* obtained during the first term of the project are shown in the *results* section. Finally, our *conclusions*, along with some advice, and future lines of work, are presented in the last section.

2. STATE OF THE ART

Weblogs have been used in many contexts where diffusion of knowledge is important. See, for example, Kempings [10], or the channel about knowledge management at Topicexchange.com [11], and [12] for a description of the later. Since the generalization of the access to the Internet by many people, teachers and Universities have tried the medium as an addition (or, even as a substitute) to the classroom. Weblogs have not been an exception and ranging from promoting the literacy in the classroom [13] to other topics, proposals have appeared. For example, in Spain we are aware of two more initiatives using weblogs at the classroom: in the Univerdad de Navarra, course "Conceptos, principios y técnicas para el análisis y el diseño de información y navegación en medios digitales" (Concepts, principles and techniques for the analysis, design and navigation in digital media" [14]), and at the Universidad de Deusto, course: "Nuevas tecnologías en la sociedad de la información" (New Technologies in the society of information) [15]. Of course, there are other initiatives worldwide and Weblogg-edd [16], or Stephen Downews web [17] can be a good starting point for searching them. Look at elearnspace [18], for a more general approach. Moreover, [19] is an interesting reflection about personal webpublishing as a learning tool, and [20] concentrates on Weblogging as a learning tool in more traditional contexts.

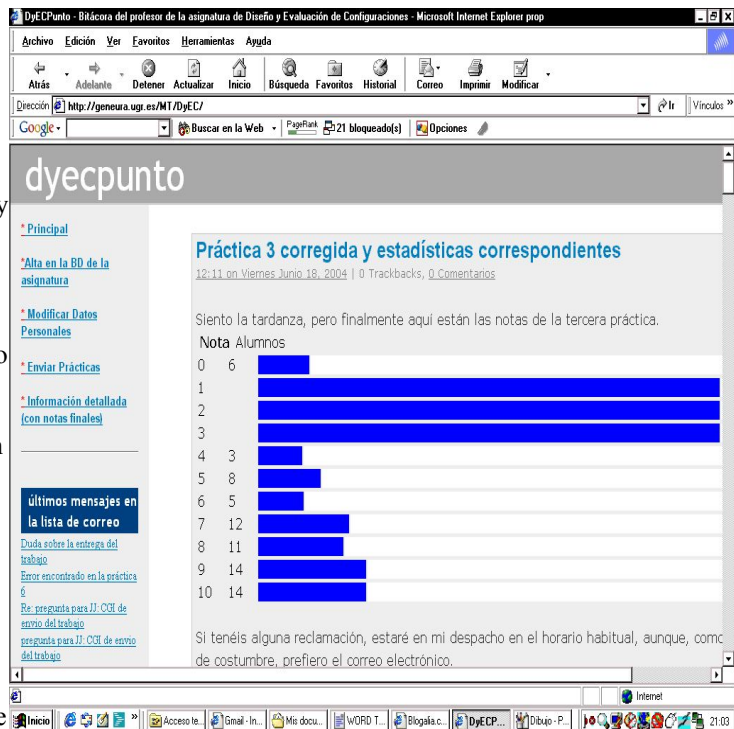


Figure 1 Professor weblog, and portal to all weblogs.

3. METHOD

First of all, among several weblog management systems, one had to be chosen. Another choice had to be done before that: to host the weblogs on-site, or leave freedom to use whatever weblog hosting system students wanted to use. We decided to use an onsite system; first, because it also allowed the professor to experiment with them, and second, because several aggregation capabilities could be added to the system, besides the aggregators that collate RSS sources from different weblogs.

Once that decision was made, we had to use a system that was easily configurable, installable, usable, and that could host different weblogs, with different authors, at the same time. Being an open source system also was a plus. Several frameworks allow this: Movable Type, pMachine, Blossom. MT and pMachine are quite similar; the main difference is that MT behaves dynamically only at the time of entering new histories or comment, while pMachine is dynamic; that can be a problem if the number of comments or stories is too high, but we didn't expect a high load and that is why MT was chosen.

MT installation with available facilities (database, Perl, web server) was quite straightforward. The project was presented to the students, who could request a weblog in a voluntary basis. It was not included in the final grade; however, 20% of the final grade was devoted to *participation in class*, which included physical presence, participation through the mailing list and weblogs, and also, presentation of self-evaluation exercises, which could only be submitted by students through their own weblogs. Weblogs were set up by hand by the professor.

Along the year, several requests were made to the students, that had to be answered via the weblog. For instance, a “Weblog and media”[21] workshop was held at midterm, and students were asked to send their impressions via their weblog; at the end of the year, they were also asked to expose what they had learned during the term in their weblogs.

Some additional tools had to be developed in order to make the professor weblog a portal for the rest of the blogs. Using the Movable Type API two plugins were developed to show the latest stories and the latest comments published in all weblogs. Server-side includes were used to deploy some tools that drew information directly from the database, and that could be posted as weblog stories (for instance, the script that extracted information about self-evaluation exercises, or practice grading statistics. All tools were developed in Perl.

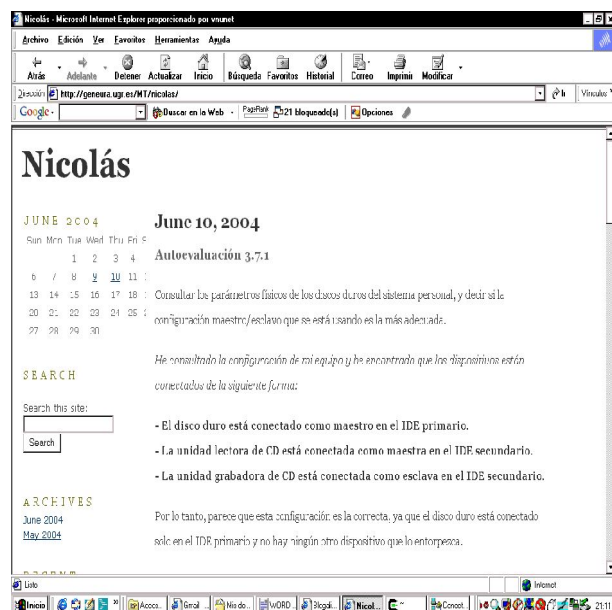


Figure 2 One of the student weblogs

4. RESULTS

The experience yielded better results than was expected by the beginning of the term. In fact, we expected to open just a few weblogs, and to have even less by the end of the term. But, all in all, many weblogs were opened. At the time of writing this paper (19 June 2004), numbers where as follows:

- 40 weblogs opened (one was maintained by the professor). The whole list is at <http://geneura.ugr.es/cgi-bin/DyEC/blogs.cgi>. Some of them were maintained by several students.
- 482 stories published. 60 of them were posted at the professor's weblog.
- Around 100 comments made to stories.
- Around 90 students had signed up for the subject.
- Class attendance was around 20 persons by the end of the year.

Weblog postings

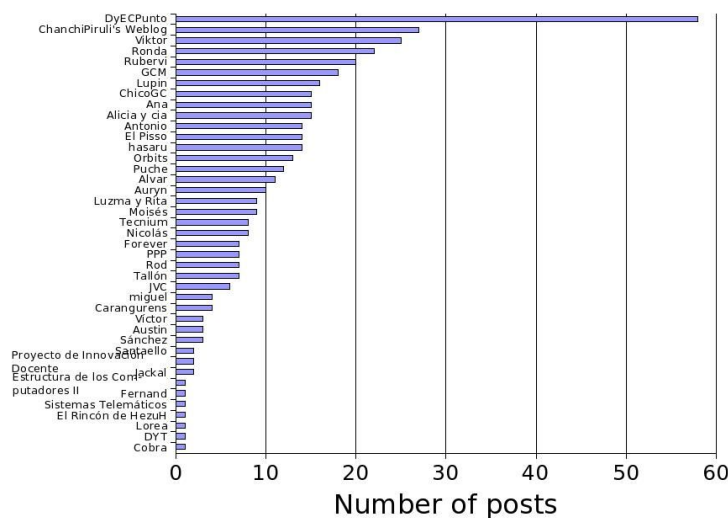


Figure 3 Number of posts/weblog

The main objective of the experience was fulfilled. For starters, many more self-evaluation exercises were sent than the previous year, when they had to be sent directly to the professor via email. During this year, 145 exercises were published in weblogs; exercises had to follow a particular convention (they had to be titled Autoevaluación x.y.z); a story was posted to the professor weblog which automatically included all stories published in the student weblogs that followed this convention. Besides, some self-evaluation exercises were read aloud in class by the author or the professor; students were paged via SMS just in case they wanted to read and defend exercises themselves.

Several sets of posts were also made under request from the professor: 17 synthesizing what they had learned during the term, by the end of it, 12 reviewing the *Weblog and media* talks and roundtable that took place by midterm [21]. Most of the rest of the postings were highlighted some points mentioned in class, like the existence of profilers in languages different from C; or were used by the students as reminder of some newsitem that was interesting for them.

Many of the students changed the default template for their weblog, making it something more personal that just a place for publishing things fast.

However, many students did not use weblogs to their full extent: for instance, it is common in weblogs to quote and hyperlink; while students, in many cases, just cut and pasted news they found interesting into their weblog. Sometimes, they were not aware of comments, and did not comment back when somebody posted a comment to their weblog; and finally, just towards the end of the term they discovered tools like *trackback*. The organization of the workshop [21] on weblogs and media also helped.

5. DISCUSSION AND CONCLUSIONS

In general the experience was good enough so as to make the arrangement permanent. Weblogs will become a permanent part of the classroom. Asking students about what they had learnt during the year (which was reflected as a professor weblog story [22]), some of them answered that learning how to publish using weblogs was one of the things they most valued (even if that is obviously not the topic of the subject). In a poll conducted using YahooGroups, more than half of the students that answered said that they would keep their weblog after they had passed the subject, and several said they would move it to other weblog hosting service.

From the point of view of the class itself, one of the students mentioned in her weblog that the atmosphere in the class had been very good; getting to know the other classmates is never a class objective, but it obviously improves class involvement; it is anyways, difficult to measure.

Students got very soon the grasp of the self-publishing spirit: during the 11-M events, several students posted in their weblogs (and there was a very lively discussion in the mailing list). It is, once again, not the main topic of the subject we were trying to teach, but nonetheless an interesting subproduct of empowering the students to publish their thoughts.

One of the main problems that this project faced was the static nature of the Movable Type publishing system, which meant that, until a new comment or story was posted to the main weblog, or the professor generated it, it was not refreshed. That is due to the nature of MT, but could be overcome using server-side includes. Another one is the fact that new users and weblogs have to be added by hand; a script would have made the whole process much easier.

It was essential during the experience to offer some incentive for the students to use their weblogs, even if it is a small incentive. Self-evaluation exercises and their use of the weblogs only amounted up to 20% of the grade, but, even so, those exercises take up the bulk of the posts (almost 1/3rd).

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Comments/blogs

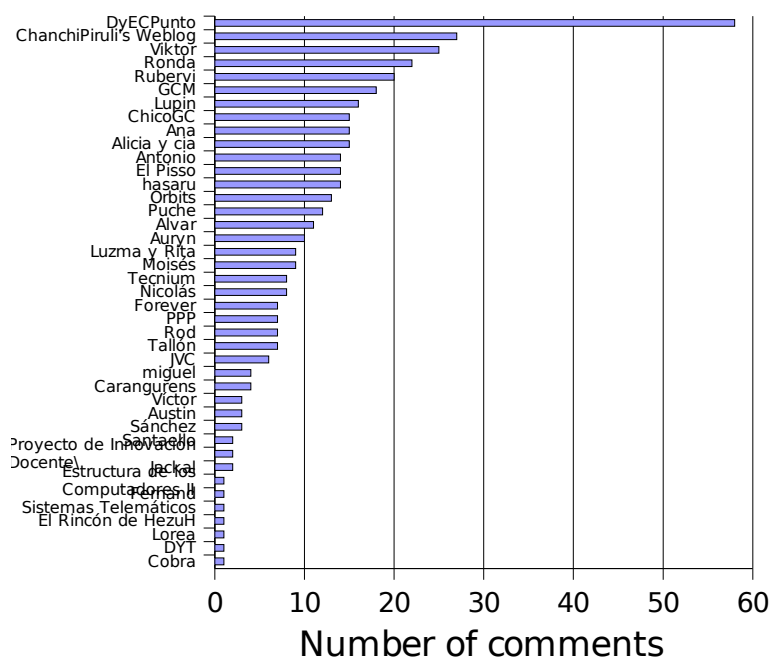


Figure 4 Comments posted in every blog

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