

COLLABORATIVE LEARNING BY DESIGN THROUGH GROUP BLOGGING

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ABSTRACT

This paper concerns the case study of a group blogging with the help of which, the participating students implemented a collaborative “learning by design” activity. More specifically, the students jointly designed Geometry learning activities with the purpose of exploiting technologies that are suitable for young children. The analysis of the viewpoints of the participants as well as of the blog content provides interesting information on the possibilities of exploiting blogging to improve the quality of higher education instruction.

KEYWORDS

Blogging, learning by design, collaborative learning, social software

1. INTRODUCTION

The development and availability of social software applications sets new challenges and opportunities for the learning technology community. The term “social software” refers to computer network applications which allow group communication and interaction. The educational community’s interest for social software is based on the idea that it is consistent with the modern learning theories. The theories of constructionism (Papert, 1993) and social constructivism (Ernest, 1994), in particular, emphasize the importance of learners’ active participation to social activities during learning, which is mediated by the design and construction of artefacts.

Among the various “social software” applications, the present paper focuses on the use of blogs. A review of the educational uses of blogs is presented by Downes (2004), in which, among others things, it is argued that students who participate in blogging have the opportunities to:

- a) Reflect on their texts,
- b) Engage in writing for significant time intervals, and
- c) Trigger off long dialogue with their readers leading to new writing cycles.

There are relatively few published studies concerning students’ learning processes on Mathematics Education through networked software applications and even less concerning blogs in particular. For

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example, Bairral (2007) describes the case study of a community of practice in which future Mathematics teachers interact using an electronic communication environment. The main goal of the researchers was the analysis of students' interactions in this environment. The analysis showed that in such an environment, what could prove interesting is the analysis of additional dimensions, such as: the impact of the work assigned to students, the teachers' role, the participants' behavior and intentions, the dialogic views of the implemented communication etc. Makri and Kynigos (2007) describe a case of the integration of group blogging in a postgraduate course in Mathematics Education as a medium of asynchronous communication and reflection impulse. The researchers focus on the study of the change in the participants' roles and practices, documenting it with findings from dialogue and social practices analysis. The discussion genres -according to the researchers- expose structured cognitive presence and constitute a significant evidence for the learning value of blogging.

Following the direction of educational exploitation of social software, in this paper we present a case study concerning the creation of a group weblog. The purpose of the weblog was to support a students group of the Department of Pre-school Education and Educational Design in the design of technology-mediated Geometry learning activities. The main aim of the intervention was the investigation of exploiting blogging for the collaborative "learning by design" pedagogical approach in order to enrich the quality of higher education instruction.

In the following, we initially present the theoretical framework that formed the basis of the study design, then the research conditions and the main research questions are reported and finally, the research findings are analysed followed by the authors' interpretations.

2. THEORETICAL FRAMEWORK

Our basic theoretical ground stems from the so-called sociocultural view for learning, which being based on Vygotsky's work (1986), stresses the importance of social interactions in the establishment of knowledge. Language plays a determinant role in this process. Given its systematic organization, its consciousness and intentionality, written speech in particular (Duval, 1999) constitutes an expedient field of study not only of the cognitive processes it depicts but also of the other communicative and personal objectives that it expresses as well. As a matter of fact, the participants in every social interaction organize their actions so as to preserve their face, that is, the positive social value one claims for him/herself (Goffman, 1972). Furthermore, they also take into consideration the preservation of the face of the other participants, applying various politeness strategies (Brown & Levinson, 1987). These findings proved particularly useful in the analysis of the roles of the participants of the blog.

The design of the experimental part of the study was based on the hypothesis that it would be possible to provoke the use of written speech in an educational environment, if we combined the blogging exploitation with some discrete learning strategies (pedagogical approach). The weblogs or just blogs are World Wide Web (www) sites where a group of people can publish hypermedia articles (posts), presented in reverse chronological order. Modern blogging systems provide automatic chronological archiving of posts, search service based on keywords, etc. As far as the interactions facilities are concerned, blogs basically allow users to publish comments on articles. It is interesting to compare blogs to other "social software" in order to justify their selection in this specific case:

(i) Blogs vs. asynchronous conversations systems: The asynchronous conversations systems, usually allow a better representation of the tree structure of the conducted dialogue, but since they have not been designed for extended articles post, they usually do not offer facilities such as the publishing of simple pages, resource collections, photo albums etc.

(ii) Blogs vs. wikis: The basic idea behind the wiki is the collaborative authoring of an online document. There is no automatic chronological archiving of the articles, and it is often difficult to implement the educational "learning by design" approach, based on this content management model.

The "learning by design" approach is related to constructionism, according to which new knowledge is more effectively developed by students when they are actively engaged in the construction of an external, shareable artifact that helps them to reflect and collaborate. In learning by design activities the designed artefacts are of personal significance for the students and 'represent' the learning outcome. There are several views concerning what constitutes learning by design; according to Han and Bhattacharya (2001) learning by

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design environments include: authenticity of the design theme, a balanced mixture of constrained, guided, scaffolded challenges and open design tasks, a rich variety of feedback information for designers, discussion and collaboration, experimentation, inquiry and reflection. Learning by design activities foster interaction between participants (students and teachers). In the case of blogs, we have a communicative medium the special features of which, according to the assessment of the authors, among other things, support the learning by design approach and the participation in a special discourse community.

3. RESEARCH

3.1 Conditions

Seven volunteer students attending a University course called “ICT applications and product development for Mathematics Education” participated in the research. As part of the course, the students were required to design learning activities that exploit technological environments. The students, hereafter, will be referred to by nicknames. Students’ participation in the blog fulfilled their project obligation for the above course. After having been informed of the aim of the research, the students participated in a three-hour training in blog use. The group blog was the only way to communicate for the project since students couldn’t participate in face to face meetings for this purpose. Students could of course meet each other in classes etc. Throughout the period of their participation in the blog, the students were requested to work in four phases, as follows:

Phase 1. Students study some articles about Geometry education for young children, and the use of ICTs for Mathematics education. At the end of this phase the students post an article to the blog summarizing their thoughts on the material they have studied and are encouraged to comment on each other.

Phase 2. Students familiarise themselves with the use of two java applets (“Lady Bug” and “Turtle Geometry”) (NLVM, 2007), inspired from logo programming language and developmentally adapted for young children. At the end of this phase the participants publish their views on the applets, their use, etc.

Phase 3. Students design classroom learning activities by using the given java applets. In addition, students have to peer review and comment on the designed activities proposing corrections, improvements extensions etc. The goal of the group is to publish a common set of activities as their collaborative final product.

Phase 4. In the last phase students assess their participation in the blog. More precisely, the students prepare a reviewing article.

The duration of every phase was about one week except for phase 3 that lasted two weeks because of its work load and importance. The above learning by design activity was implemented during the second semester of the academic year 2006-2007.

3.2 Research hypotheses and questions

The basic hypotheses behind the design of the above described intervention are the following:

1. The students can relatively easily get acquainted with the use of blogs to such an extent as to be able to exploit them for educational purposes.
2. Blogs can efficiently support the requirements of learning by design activities in such a degree that participating students can have increased opportunities for: a) meeting high quality learning experiences, b) communicating and interacting with their peers and teachers, c) getting feedback information in order to review and revise their designs and d) developing a dialogue relative to the content.

3.3 Methodology

The presented research constitutes a case study. The analysed research data include the user-to-blog interaction log files, the published content of the blog (articles and comments), the questionnaire that students

answered upon the completion of the activity and an audio-recorded students' group interview that was also organized after the completion of the activity.

3.4 Research data analysis – Findings

In this paper the presented data analysis refer to two axes which correspond to two categories of the data resources. The first category is about the text-content of the blog whereas the second one concerns the questionnaires and the interview.

3.4.1 Axis 1. Blog content analysis

The data analysis was performed in two stages. Initially, every article and every comment was categorised with regard to its contents and its communicative purpose. We ended up with the following categories:

- INF1:** Original article
- INF2:** Enrichment of one's own original article
- INF3:** Comment on someone else's article
- INF4:** Reply to a comment on one's own article
- INF5:** Reply to a comment on someone else's article.

Table 1. Number of publications per category

	INF1	INF2	INF3	INF4	INF5
Mina	4	0	21	2	4
Tassos	5	2	6	2	1
Valia	3	1	13	0	0
Evi	5	0	3	2	1
Roula	4	0	0	0	0
Kate	4	5	10	4	1
John	3	0	7	0	0

From Table 1 and Figure 1 it is obvious that there has been a differentiation concerning both the number and the types of the posts. In the INF1 category we notice that two students posted the minimum required number of articles (three) and most of them posted one or two additional articles. Only three students enriched their articles with posts of the INF2 category type. Kate plays a leading role in this aspect and she was in general the most enthusiastic in terms of activity. Larger number of posts appear in the INF3 category (comments on others' articles) in which students –with the exception of Roula (no comments at all)- illustrated a rich production of comments on the articles they had read.

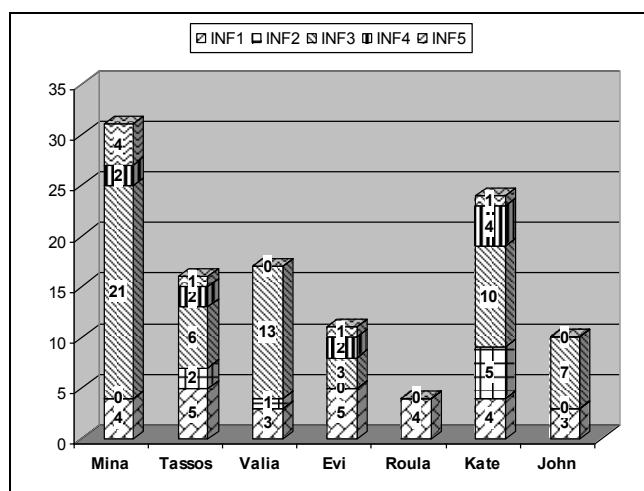


Figure 1. Students' contribution per post/comment category

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The posts of the INF4 category are clearly fewer since there were comments that never received an answer. The students justified this by saying that they found it difficult to be informed about recent comments on older articles. The posts of the category INF5 are even less, a fact that demonstrates the limited participation in this kind of exchanging comments.

In the second stage, we analyzed all the posts in two levels, using a variation of the method proposed by Mercer (2000). In the first level, we located the three types of discourse mentioned by Mercer, namely the educational, academic and everyday discourse. In the second level, we examined the speech acts that were performed in every text, mainly bearing in mind the face-saving perspective. In the first level of analysis we located many instances where the students used 'academic discourse', such as the following one:

Learning objectives: Orientation, understanding of the concept of degree and its correspondence to the relative motion. (Evi, 29/5)

We can observe a list of concepts briefly expressed, and preserving an impersonal manner due to the absence of verbs. Many participants (including the teacher) also used 'educational discourse' in their posts:

Kate, your first activity is very good. I believe that it can be easily comprehensible by a preschooler ... Moreover, in this activity children can make comparisons and get familiarised with the notions of "smaller" and "bigger". (Valia, 14/6)

What is distinctive of the above excerpt – apart from the initial assessment – is the summary that follows, a common strategy used by the teachers as well.

The second level of analysis revealed a clear intention of all the participants to preserve their fellow-students' face. Thus, the overwhelming majority of the comments started with positive remarks which were usually followed by the basic remark:

Michael, your ideas are interesting...I would suggest not to use the term collage since you are not going to stick anything. Moreover, the term "knowledge: does not seem appropriate; it's better to use the terms familiarisation, informing, briefing when you talk about the aims ... (Mina, 29/5)

The above excerpt is of special interest, since apart from being based on the scheme "positive remark-main comment", it contains utterances – the underlined ones – that express some politeness strategies (Brown & Levinson, 1987), that is, strategies with the purpose of "softening" the threat to the reader's face (see e.g. Tatsis & Rowland, 2006).

A second remark is that, the participants sought to preserve or even strengthen their face, mainly by incorporating academic and education discourse elements in their speech. Another strategy towards this direction was the avoidance of answering to comments or to the teacher's prompts for further investigation on particular issues.

3.4.2 Axis 2. Participants' views

The participants' views about their blogging experience have been recorded using the final questionnaire and the common round-table conversation (group interview) that took place by the completion of the activity. The students' views analysis is organised according to the following dimensions:

(2a) Writing for readers-commentators and peer reviewing,

(2b) The features of constructive comments,

(2c) Appropriateness of blogs for the pedagogical approach and

(2d) General opinion and difficulties. Open questions with unfinished sentences have been used for the examination of the students' views. In the following, the most significant findings are presented per sub axis.

2a.) Writing for readers-commentators and peer reviewing

From the students' answers to relative questions, it seems that students were initially hesitant about posting articles and even more hesitant to comment on their fellow-students' articles. They state that they felt uncomfortable and thought hard about the possibility of being misunderstood. Eventually, most of the students overcame their diffidence and some of them state that they were excited by the exchange of

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opinions. There was, nevertheless, one student that did not post any comment and another one who declared that he would only post positive comments.

As far as the received comments are concerned, students in general state that they helped them to identify their mistakes and improve their work. As for the negative features of the comments, students state that they were not always informative and that some times certain partners hesitated to express their judgments. Some students declared that they could produce more comments if they had internet access at home and/or there were more participants in the blog. Extracts from answers in the related question are cited here in after.

A3E2. Writing comments on my fellow-students' articles...

Valia: was not an easy task because it was only based on our personal judgement rather than on a general model.

John: I can say that they contributed in the improvement of my opinion about some questions....

Kate: It was difficult especially in the beginning because there was the risk of misunderstanding. I was careful about the way of expressing my opinion.

Mina: It made me feel uncomfortable initially but in the course I liked the process of commenting on mine and my fellow-students' articles.

Tassos: It puzzled me in the beginning because I did not like to comment negatively my colleagues despite the fact that it could help them to improve their errors.

Roula: It was something that I did not do many times over [actually she did not post any comment].

2b.) The features of constructive comments

About the features of constructive comments, the students, among other things, mention that comment should: be well-intentioned, have friendly style, be clear, mark problems while proposing solutions with the aim of continuous improvement. Some characteristic answers are quoted:

A3E10. The comments help more when ...

Valia: They are clear and potentially propose some way to face a problem.

John: They aim to get you improved by vital remarks. Even for the best article you should prompt the author for improvement.

Evi: They are honest despite of the interpersonal relations of the participants.

Kate: They are guiding and mention the mistakes.

Mina: They are well-intentioned, informative and written by people having knowledge about the article theme.

Roula: They have a friendly-consulting style.

Tassos: They point out mistakes we have done in some activities helping us to improve them.

2c.) Appropriateness of blogs for the pedagogical approach

It seems that students understand the communication requirements of the pedagogical approach as well as the value of the capability of monitoring the whole process during the activity. Among other things, they point out the difficulties they would have in organising the required face-to-face activity without the use of the blogging system, and that they wouldn't have the possibility of commenting on each others' articles as

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well as continuously monitoring the evolution of the proposed designs. The quoted answers of students are indicative:

A4E6. If the blog was not available for the implementation of the same work then...

Valia: probably we could not have the feeling of collaboration and responsibility to each other so intensively.

John: in order to manage taking our collaborators' opinions we should arrange meetings for all the members. Even if this was feasible we were going to face difficulties because of the lack of the capability to continuously monitor the work of others.

Evi: we could not easily have our own designed activities commented and articles by the rest of the participants.

Kate: we would face a coordination problem. Each one of us has many obligations and blogging is highly demanding in terms of the required meeting.

Mina: we were going to need much time, many transfers or the use of some other software that would demand special skills.

Roula: we were probably going to use the "traditional" methods and lack this experience.

Tassos: we wouldn't have the chance of direct communication between us. (Comments between us)

2d.) General opinion and difficulties

In general, the students declared themselves satisfied by their participation and most of them mentioned that they would participate in group blogging in the future while some of them intend to run a personal blog as well. Students' proposals, for the improvement of similar activities in the future, include the extension of the duration, the increase of the number of participants, and the development of a new activities notification service. It is worth mentioning that in the question (posed during the round table) about why some comments in the form of questions had not been answered, the students seemed to be unaware of the fact; moreover, they mentioned that it was difficult for them to know about new comments on their old articles. In terms of getting acquainted with the use of blog, the major difficulty reported in the questionnaire was the attaching of files.

4. DISCUSSION-CONCLUSIONS

With respect to the basic research hypotheses, we review the research findings as follows: a) As far as the familiarisation of students with blogs is concerned: The successful completion of the activity, the articles, and the comments' quantity and quality show that despite the initial difficulties, students acquired the required skills for blog use, rather fast. b) As far as the appropriateness of blogs for the implementation of learning by design activities is concerned: Students had increased opportunities to receive quality information feedback as the fellow-students' and the teachers' comments reveal. Furthermore, the students have described the features of constructive comments that helped them to overcome their initial hesitation about the peer review and commenting. The blog support for the learning by design activity, according to the students, was decisive both in terms of communication and efficient coordination, eliminating the need of face-to-face meetings.

In addition, the blog content analysis has shown that all participants followed some face-saving strategies in order to protect their own and their colleagues' face. This has not prevented them from posting meaningful and useful remarks, getting deeper into the learning activities design process. The teachers had the chance to keep track of the design process and to intervene whenever necessary, both at personal and group level, so as to facilitate and maintain the work of the group.

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Furthermore, the analysis of the weblog system interaction log files, the detailed description of which is out of the scope of this paper, shows that students have built a high density interaction network. Students were reading and commenting their peers' posts in almost any possible pair. The learning outcome of the "learning by design" projects can be evaluated by the final product; in the presented case study students produced a rich variety of high quality learning scripts in an evolutionary process, the detailed presentation of which is also out of the scope of the paper.

The above remarks lead to the conclusion that the students have experienced a high quality learning experience, which contained a rich and long-lasting dialogue relative to the learning content, as well as opportunities for collaboration and reflection.

The presented study extends similar studies like those of Marcelo and Bairral (2007) or Makri and Kynigos (2007), because it focuses in the particular case of the combination of weblog as an information and communication management system for the implementation of the specific "learning by design" pedagogical approach.

Improvements for similar future applications could include the consideration of other pedagogical approaches, an increased number of participants, a longer duration, and the development of a new blog activity notification service, briefing any new comment or article for each participant separately. It is the authors' conviction that blogs exploitation has the potential to enrich the quality of future teachers' education, both in terms of content and Didactics.

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