

The Project Method e-course: the use of tools towards the evolution of the Greek teachers' online community

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Abstract: The second web generation (Web 2.0) opens up new perspectives for community building through communication and collaboration. Open Source Software (OSS) have contributed to the viability of educational courses and extended the potential of online learning. Yet, if the aim is to provide users

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with a dynamic context allowing collective intelligence to emerge, not only is the development of appropriate learning environments required but also the integration of a flexible pedagogical scenario. For the purposes of this paper, the authors focus on a pilot e-course implemented on the Greek teachers' national intranet e-learning platform aiming to provide evidence that the transition from an information retrieval situation to a social learning situation requires the mediation of improved OS systems. In these, design should aim for the encouragement of the users' cognitive and social presence so that knowledge can be constructed through collaboration and critical reflection within an active online community.

Keywords: collaborative learning; critical thinking; Web 2.0; Open Source Software; OSS; Moodle; communities of practice; online communities.

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1 Introduction

Rapid technological advancement influences communication and information management as well as knowledge construction. Within the context of new challenges, lifelong learning emerges as a fundamental element for the constant development of professionals so that they dynamically adapt to change and retain a state-of-the-art identity. Open Source Softwares (OSS) can provide an open-to-many environment for content and learning management, complying with current socio-cognitive theories of learning. According to these, knowledge is gradually constructed on interactions that encourage the formation of new schemata in a social context. The incorporation of synchronous and asynchronous communication tools provides the environment for collaborative content creation, sharing and refinement, thus contributing to the new paradigm of collaboration, collective intelligence and community building. This new reality challenges existing systems, creating new potential for effective learning to take place.

Responding to the need for reform of educational services in Greece and for integration of Information and Communication Technologies (ICT) in education, the Greek Ministry of Education (www.ypepth.gr) has advanced the planning, growth and operation of the Greek School Network (GSN) (www.sch.gr). The GSN provides pedagogically informed, certified telematic services aiming to encourage cooperation and collaboration. The GSN interconnects a large number of stakeholders in the Greek educational system (59.09% of Greek nursery schools, 99.48% of junior secondary schools, 100% of general and vocational high schools, 20,895 primary school teachers, 37,932 secondary school teachers, as well as a total of 2595 administrative units). Nevertheless, there has been little evidence of a collaborative framework that could facilitate the evolution of the Greek teachers' online community into a networked community of social exchange and practice. To this end, a more systematic approach built upon current theories of learning, change and community management is required.

Acknowledging the Greek teachers' need for professional development (Lambropoulos, 2005) through networking, the authors of this paper designed a course hosted on the e-learning Moodle OSS platform of the GSN (<http://e-learning.sch.gr>). The 'Project Method' (PM) e-course aimed to provide input on current pedagogical principles and methodologies in order to enable teachers-participants to reflect upon didactic approaches and practices and reorient them towards a more learner-centred paradigm. In addition, it was assumed that through this process, the teachers'/e-learners' online identities would transform along with the improvement of their interactive-internet skills. Moreover, an awareness of the community was expected to gradually develop

and, through constructive communication and collaboration, a degree of professional development would also be attained.

The principles that constitute the backbone of the design and implementation management of the course are discussed in the following section.

2 Fundamental concepts in online learning

2.1 Learning management principles

The 21st century signified a turn from the Industrial Age to the Information and Collaboration Age (Lambropoulos, 2006). This change also underpinned the need for adults to process new data in order to adapt to neomillennial developments and to perform professional tasks within a social, interactive context (Dede, 2005). The implications arising for online learning relate to the parameters that contribute to the 'augmentation of human intellect' (the term was coined by Engelbart, in Engelbart, 1963) through active participation within a social context. These factors refer to two basic issues: the process of knowledge construction and the maintenance of the e-learners' interactivity, which sustains knowledge building online.

As far as learning management is concerned, the approach adopted by the Moodle@GSN reflects the constructivist and social constructionist view (Dewey, 1933; Berger and Luckmann, 1967; Piaget, 1972; Vygotsky, 1978; Bandura, 1986; Bruner, 1991; Papert and Harel, 1991; Mercer, 1995) of reality as an ongoing, dynamic process which individuals experience and participate in so as to form own perceptions. In this light, the synchronous and asynchronous tools integrated in the Moodle@GSN environment as well as the virtual classroom interface facilitate the process of information access and retrieval, storage, reflection, hypothesis formation, application, evaluation and constant dynamic update of hypothesis formation. Therefore, as the teachers-members select an e-course that facilitates knowledge construction and encourages interaction they are potentially on the verge of achieving collaborative learning (Mercer, 1995). Yet, if the aim is to promote cognitive development, the exploration of the interactivity maintenance factor is necessary.

2.2 Online community learning principles

The Greek primary and secondary school teachers constitute a large group of professionals sharing an interest in educational matters, common problems related to the field and possibly a passion about relevant-to-education topics. Therefore, according to Lave and Wenger (1991), this group can form a Community of Practice (CoP) whose members are able to deepen their knowledge and expertise in shared domains through an ongoing interaction (Wenger et al., 2002) on the Moodle@GSN platform. Learning within a CoP context can initially have a peripheral nature and gradually develops into a more centralised form, as the members gain in experience and knowledgeability (Legitimate Peripheral Participation) (Lave and Wenger, 1991).

Adopting principles set by Human Computer Interaction pioneers (e.g. Engelbart, 1963), the authors of this paper agreed that 'augmentation of human intellect' can occur within online CoPs facilitated by OSS learning platforms while discussing the design of the PM e-course. Online environments can provide the platform to stakeholders in

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education to constitute a new type of community, i.e. an online community. Online communities, according to Preece (2001), can form in any virtual social space where people come together to get and give information or support, to learn, or to find company. Online educational communities can both have a focus on educational outcomes and play a supportive role for individuals (Wellman, 2001). However, as the results of a research on the Australian School Network (Hartnell-Young et al., 2006) indicate, the establishment and maintenance of a meaningful online learning community on a national basis is a time-consuming process. Instead, smaller sub-communities can emerge online depending upon the users' initial interest in existing topics. The authors share the opinion that practice in the Moodle@GSN confirms the previously mentioned assumption expressed by Hartnell-Young et al. (2006).

The number of teachers enrolled during the period 2003–2006 (853 out of 4350 GSN members) in a total of 33 courses offered on the GSN e-learning platform signifies these potential course participants' initial motivation for online personal and/or professional development. The thematic area each e-course (e.g. web design, religious education, etc.) delves into triggers the Greek teachers' initial interest. Yet, overall low participant activity in the Moodle@GSN courses and the limited number of contributions instigate the authors' decision to systematically employ appropriate innovations for the GSN strategies in order to involve the teachers-users both socially and cognitively.

Moreover, as Hartnell-Young et al. (2006) suggest, the ultimate goal of knowledge construction facilitated by information, practice and experience sharing can be met only through decisions made upon the solution of large-scale and local educational problems. One such significant educational issue is the introduction of innovations into the existing teaching paradigm through the Revised Cross Curricular Framework proposed by the Greek Pedagogical Institute and institutionalised by the Greek Ministry of Education (Greek Government Gazette 303 & 304/13-3-2003). To resolve implications arising from this new situation, the authors designed the PM e-course, which is discussed and analysed in the following sections.

3 The PM e-course

3.1 Design and implementation

The course aimed to respond to the Greek educators' need to keep up-to-date with educational developments and curricular innovations. As the implementation required the exploitation of an OSS environment, the main aims were both pedagogically and technologically oriented and included both the development of the participants' metacognitive skills as well as that of their internet–collaborative–interactive skills and strategies (Lambropoulos, 2006). Therefore, new approaches were adopted towards collaboration and the New Web in order to facilitate grounding and building a Joint Problem Space (JPS) between the participants (Teasley and Roschelle, 1993).

The effectiveness of the community relies heavily upon the members' reflective attitude, which is associated with the critical thinking process (reflection–analysis–evaluation). According to Garrison et al. (2004), evidence of participants' cognitive (i.e. learners' ability to construct and confirm meaning) and social presence (i.e. participants' ability to present their personal characteristics to the community) in an online environment facilitates and sustains the reflective process. Therefore, the e-course

syllabus adopts the principles of the practical inquiry model proposed by Garrison et al. (2004), which is summarised as follows:

- initiation phase, i.e. the motivation for professional development that the PM didactic approach activates
- exploration of the e-course input material
- meaning construction through exchange and reflection in asynchronous discussions and chats
- collaborative design of tasks based on the Project Method.

It is noteworthy to mention that during the e-course implementation the particular syllabus was far from strictly followed, given that it aimed to address the needs of adult e-learners, who have already reached a degree of autonomy and are able to self-regulate their own learning process. On the contrary, it was under constant negotiation and dependent upon the participants' ideas, comments and suggestions. This complies with Thompson and MacDonald's (2005) observation underpinning the significance of course design flexibility in order to respond to emerging learning needs. Evidence of the successful nature of this process provides the fact that the participants decided to embed the principles and tools dealt with in the e-course in their own teaching syllabus.

3.2 The e-course tools

Discussion forums and chats, aimed to enable participants to enhance social and cognitive presence for the encouragement and assessment of online collaborative discussion, aimed for staff development (Bezzina, 2006).

All in all, it became clear that active participants (13) (i.e. those who contributed to the e-course more than once) exploited the opportunities for engagement through shared activities and responsibilities in order to form online identities, to expand their knowledgeability and to explore new territories, and, through this process, to develop shared practice and commitment. More particularly, the PM e-learners:

- alternated roles and experienced the benefits of collaborative learning (two of the participants assumed the role of group leader and coordinated three chat sessions)
- developed a sense of community through active involvement
- applied new knowledge to teaching practice (integration of the PM principles into classroom procedure and project design negotiated with their students, blog creation for classroom purposes)
- agreed on a common presentation concerning projects through the use of ICT during a conference organised by the University of Ioannina (17–20 May 2007) (<http://conf2007.edu.uoi.gr/index.html>).

4 The study

4.1 Participation data

The online PM course was created on 4 June 2006, had 39 participants, 3 e-tutors and 3 technical support staff, and extended over a five-week period of time (15 October–15 December 2006). A four-week plan appeared on the e-course interface to facilitate the distribution of resources, tasks and activities while during the fifth week a chat session was held for feedback purposes. The results were impressive considering the problems the Greek teachers face (Lambropoulos, 2005) and the six-week strike¹ that started at the same time the course was launched. The activity is reported in Table 1.

Table 1 Activity in the 'Project Method' e-course

	<i>Total number</i>
Forums	
Number of topics	10
Number of new discussions	37
Number of sent messages	104
Number of posters	13
Chat	
Number of messages	1445
Number of posters	11

Table 1 shows a significant activity as regards previous learner use of Moodle@GSN. From the total number of 39 participants in the PM e-course, 33.3% were active participants compared to the 66.7% of lurkers. Respective overall Moodle@GSN activity exhibits a total number of 4350 GSN members, 853 of whom are registered Greek teachers; 25 of these active participants are e-tutors. This means that 19% of the total number of registered users exhibited some kind of activity (e.g. visiting the online courses, posting in chats and discussions) in the online setting and 3% are e-tutors (the overall Moodle@GSN activity report data refer to the period up to 1 November 2006). Since the introduction of the GSN e-learning service (2003), a total number of 206 messages have been registered. Eight discussion threads were initiated by e-tutors and 18 by participants, resulting in 132 messages sent by e-tutors and 74 by participants. There were 94 new topics of discussion launched by 34 e-tutors. In 22 courses there were chats activated, having 1000 messages sent by 138 participants.

It should be noted that out of a total of 33 courses available on the e-learning platform of the GSN, the course analysed in this study is the first one in the Network to attract this large amount of views in its forums, as shown in Table 2 and compared to a total, where the views of the 41 different threads created in the forums are grouped.

Table 2 Users' posts and views in the 'Project Method' e-course

			<i>e-Learners/users</i>		<i>Views (clicks) by active members</i>
			<i>Total registered</i>	<i>Active</i>	
1	Acquaintance	Profile			190
2	Initialisation	What we want from the e-course, initial questionnaire, etc.			145
3	Technical subjects	Support, problems, etc.			48
4	Newsletters	Six different newsletters	39	13	103
5	Project method related	Proposals, case studies, etc.			223
6	Related to synchronous e-course's activities				168
7	Collaborative web tools proposed for project method implementation	Blogs, wikis, website design-creation, educational software			127
8	Others				107
Total					1147

4.2 Discussion forums

As far as contribution to asynchronous communication is concerned, of the total number of new discussions (37), 11 were initiated by the course participants, while out of a total of 104 messages, 29 were generated by the e-learners. The participants (13), all different individuals, produced 41 threads with approximately 12,500 words in total. The analysis of contributions depicts the teachers':

- critical attitude towards problems arising from practical implications and lack of training in current teaching and learning methodologies (e.g. Participant A: '*...as training [in current methodologies] is literally non-existent*', <http://e-learning.sch.gr/mod/forum/discuss.php?d=115>, 17 October 2006)
- positive attitude towards collaboration (e.g. Participant B: '*...you can find practical tips,...sample worksheets...in these [coursebooks]*', <http://e-learning.sch.gr/mod/forum/discuss.php?d=115>, 23 October 2006)
- reflective attitude towards pedagogical issues (e.g. Participant A: '*How about group formation? Who decides?*' as above, 25 October 2006)
- desire for experience and information sharing (e.g. Participant C: '*I worked with an English teacher from Finland and another one from Poland, and we ran the [e-twinning] programme from January to June 2005*', <http://e-learning.sch.gr/mod/forum/discuss.php?d=124>, 4 November 2006; Participant D: '*In the following school year 2 students cooperated with their English teacher and created two web pages...*', <http://e-learning.sch.gr/mod/forum/discuss.php?D=123>, 6 November 2006).

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These contributions clearly show that Participant A is aware of the need for a bottom-up approach towards lifelong learning and professional development through the e-course, i.e. through active participation and collaboration. Instances of the latter are shown through the contribution of Participant B, as the suggestions offered aim to facilitate A's task to deepen existing knowledge on the particular issue. Under the same perspective, the contributions of Participants C and D indicate awareness of the fact that personal experience sharing with other e-course participants can lead to professional development through participation to different types of educational activities.

Therefore, considering the richness of the context of discussion, the amount of messages produced by the e-learners (Mercer, 1995) as well as the content of the messages produced, the analysis of the messages provides evidence that the transition from an information retrieval situation to the stage of inquiry and practice has been activated.

4.3 Synchronous communication

During chat sessions and through the methodologies adopted, the e-tutors aimed to facilitate interaction and to summarise the discussion content so as to maintain the flow and coherence of communication. According to Garrison et al. (2001), these strategies indicate a degree of teaching presence, which interacts with social and cognitive presence in order to create the necessary condition for learning to occur. Based on this assumption, e-tutor interventions also aimed at maintaining overall coherence towards the achievement of the main course goal: the attainment of a degree of professional development through the PM e-course, which constitutes the initial stage of the evolution process of its online community.

During sessions (9), the participants (11, i.e. 8 e-learners and 3 e-tutors), all different individuals, discussed the following issues:

- group management
- project work management
- design of tasks based on the Project Method
- case studies implementing the Project Method
- internet collaborative Web 2.0 tools (e.g. blog creation – implementation in school projects).

Despite the results of studies pointing out the opportunity for reflection offered through the use of asynchronous tools (Stodel et al., 2006), active participation in the PM chat sessions as well as the richness of exchanges, ideas and suggestions concerning teaching practices and the incorporation of collaborative principles clearly show the participants' preference as to the use of the synchronous communication tool. This preference can also signify the ability of the chatroom tool to minimise the impact of the absence of face-to-face communication in the particular learning context. As participants and e-tutors come from different parts of the country as well as abroad, the possibility of meeting, getting to know each other and discussing relevant-to-the-course issues before and during the e-course was reduced.

4.4 Discussion

It is a fact that the broader societal impact of the Greek teachers' online community, according to the CoP infrastructure proposed by Wenger (1998), is yet to be systematised and investigated. Nevertheless, the data gathered during the PM course progression provide clear evidence that the participants activated higher-order thinking skills in order to:

- adopt a critical stance towards professional needs and requirements and assume an active role for the improvement of their working environment
- reflect on established beliefs and practices, criticise them and orient themselves towards new teaching and learning models
- acknowledge the usefulness and practicality of collaborative methods and techniques and customise them according to their own needs
- disseminate the new knowledge through face-to-face and/or online networking, thus contributing to the establishment of a new educational culture favouring collaboration.

Therefore, a degree of cognitive presence is apparent during course implementation, as the participants adopt a reflective attitude towards existing and innovative practices leading to an action–research approach rather than an academic orientation towards resolving problems (e.g. through assignment writing). Thus, a degree of professional development is attained; however, the fact that social presence is exhibited mainly through synchronous communication cannot confirm the attainment of deep learning.

More particularly, in this informal setting, the Greek teachers seem to value the structure and organisation of the course to a degree, as the number of visits indicates. Yet, they also seem reluctant to conform to the pedagogical syllabus requirements (e.g. assignment writing, etc.) and, thus, to assume a more traditional 'learner' role. Instead, they tend to apply their expertise to classrooms that combine face-to-face with web-based teaching and learning and to exploit the second internet generation tools. To do so, they explore ideas generated through active participation in PM course discussions. Evaluation of application of new ideas and relevant queries emerging in subsequent contributions to asynchronous and synchronous tools reinforces community building as well as course design flexibility, sustains its evolution process and facilitates the emergence of collective intelligence.

Overall, through the course, it became obvious that the Greek teachers are at the initial stages of adopting the practices of online community learning, as this type of learning is considered an innovation for the Greek standards. Although there is application of methodologies concerning both blended and purely online learning situations, systematic efforts towards the adoption of a community model based on collaboration and negotiation are lacking. Nevertheless, participation in the PM e-course provides evidence that online community building and evolution is a feasible task given that both pedagogy and technology are taken into consideration in e-course design.

Moreover, the Greek teachers' preference in the ICT training, social computing through the use of OSS and social multimedia with a pedagogical focus generates the need that policymakers consider providing support, thus encouraging and facilitating the incorporation of relevant practices directly into the practitioners' educational activities.

5 Conclusions and future trends for community building through OSS

Regarding the constraints concerning the aforementioned study, the absence of feedback through questionnaires from those registered but not actively participating and the subsequent lack of sufficient demographic data create limitations as to the applicability of results. However, in the next implementation period more systematic guidelines will be offered to Greek teachers, given that they will manage to incorporate e-learning services into their educational practice.

Concerning the educational perspective, it appears that even though the participants launched most of the discussion threads, the discussions were e-tutor dominated. From an e-learning management point of view, this result addresses the same problem that appears in face-to-face environments where teachers dominate classroom discussions. However, following the Web 2.0 philosophy, learner-generated context is the basis of collaboration and the e-tutors need to adapt their role to that of a collaborative learning activity facilitator. Resulting from this is the need to integrate informal and formal learning principles in online education (Colley et al., 2002; Cook and Smith, 2004; Gulati, 2004). In terms of e-course design, this would entail a syllabus aiming to compromise both informal and formal aspects of learning, e.g. by incorporating the use of Web 2.0 tools such as weblogs, wikis, Voice over Internet Protocol (VoIP) technologies, etc. Thus structured, the e-course could provide e-learners/participants with the opportunity to develop knowledge and skills by getting involved in planned activities and by gradually building trust and confidence in themselves and each other during informal interactions that Web 2.0 technologies encourage. Therefore, within a learning environment, where learner needs are taken into consideration the potential for enhanced participation is generated, and as interaction and collaboration among e-learners increase, the need for e-tutor presence gradually decreases.

In the GSN case, the overall process seemingly manifests the following three stages: the first one was based on provision of information and learning resources, the second stage introduces a transition to new practice and methodologies and in the third one development can be more sustained as required from a national perspective. Therefore, there are two consequences as well as challenges for the researchers and OSS developers: the need for systematic methods application and appropriate tools exploitation to support the scalability of such systems. In order to support national intranets, there is a need for constant observation and evaluation. To present, there are not adequate methodological approaches and metrics and analytical tools to support such an extensive evaluation. The essence of this process does not merely lie in the need to track the Return of Investment (ROI). OS system scalability is essential for each and every participant in online learning: policymakers, system developers, technical staff, e-course designers, e-tutors and e-learners. This links with a variety of factors that are associated with the technological and the pedagogical aspect.

Improved system functionality, e.g. improved hardware allowing for wider bandwidth, leads to enhanced participation, e.g. in synchronous discussions, and, therefore, to more effective e-course as well. Yet, this view of system scalability actually covers only one aspect of e-learning: its context. As it is the interaction of the two parameters that affects the quality of online learning, the context and the content, the integration of second internet generation collaborative tools aims to enhance the latter. Web 2.0 tools provide online environments that encourage interaction, knowledge

sharing, reflection and negotiation and ultimately empower the e-learner, as they can facilitate self-directed learning.

At the same time, the integration of new tools is another aspect of system scalability, as is the integration of evaluation tools. This is also another instance of empowerment provided that evaluation applications and tools aim to help all OL participants to form a clear idea of system design and development as well as course planning and implementation in order to evaluate their effectiveness and make suggestions and/or decisions for further improvement. The outcomes of this type of internal organisational process of evaluation and feedback can generate national standards for e-learning, which, associated with international standards (e.g. deriving from organisations such as the European Foundation for Quality in e-Learning (EFQUEL), www.qualityfoundation.org/), can lead to specific frameworks for measurement and, therefore, for e-learning quality assurance.

The new OSS tools can be incorporated in existing systems and need to support the Web 2.0 collaborative nature and facilitate asynchronous and synchronous communication as well as research. To this end, the technical GSN support works on the latest Moodle version aimed to be launched in January 2007. The more advanced tools the new version offers as well as awareness of the new Web 2.0 approaches for information sharing and collaboration is to take Moodle@GSN to the 21st century. Concluding, existing OSS supporting the Greek language (e.g. Moodle, Claroline) that facilitate e-learning appear to be growing rapidly. Web 2.0 will change the way we work and learn in everyday life and, as Norman (1998) says and as the pilot PM e-course data analysis indicates, technologies will change through their associations with users.

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Note

- 1 Around 50,000 primary school teachers and their supporters marched in Athens, Greece, last week as part of the teachers' all-out strike over pay. Available online at: http://www.socialistworker.co.uk/article.php?article_id=9901 (accessed on 22 October 2006).