Blending the Community of Inquiry Framework with Learning by Design: Towards a Synthesis for Blended Learning in Teacher Training

Katerina Makri[1], Kyparisia Papanikolaou[1], Athanasia Tsakiri[2] and Stavros Karkanis[2]
[1]School of Technological and Pedagogical Education (ASPETE), Athens, Greece
[2]Technological Educational Institute (TEI) of Lamia, Lamia, Greece
kmakrh@ppp.uoa.gr
kpapanikolaou@aspete.gr
tsakiri@teilam.gr
sk@teilam.gr

Abstract: As e-learning is evolving into a mainstream, widespread practice, adopted by higher education institutions worldwide, much effort is geared towards the articulation of models and strategies for implementing e-learning in formal education settings. In the field of pre-service teacher education, a rising challenge is to equip the "21st century teacher" with the necessary toolset of skills and competencies to grapple with the idiosyncrasies of the new generation of "millenials". To this purpose, what still remains an open issue is the degree of innovation afforded by specific e-learning designs, in a field where traditional teacher training pedagogies co-exist with e-learning-specific ones. This article proposes a synthesis of two models, the Community of Inquiry (COI) model, based on the Practical Inquiry model introduced by Garrison, Anderson, & Archer (2000) and the Learning by Design framework (LbyD), based on the conceptualization of 'New Learning', articulated by Kalantzis & Cope (2012). Both models were invented with new learning styles and circumstances in mind. The proposed synthesis guided the design of the six-month introductory course in Technology Enhanced Learning by the School of Pedagogical and Technological Education (ASPETE) research team (located in Athens) and implemented with 18 pre service student-teachers at the Higher Education Technological Institute (TEI) of Lamia, located in another geographical area of Greece. In this context, elements of the COI framework were employed as tools both for designing and for evaluating the contents, structure and activities of the e-learning course. Two elements of the framework, teaching and cognitive presence were the axes supporting the course structure, whilst the kinds of activities most promoted were discussion, collaboration and reflection. The LbyD framework functioned as an awareness enhancement mechanism for trainee teachers to formulate, collaboratively negotiate and finally articulate and support pedagogical scenarios integrating the meaningful use of technology. The discussion of this experience is supported by a dataset including students' answers to a COI-based survey, free-text student feedback and asynchronous discussion transcripts, providing evidence about the potential of the approach and pointing out issues that need to be improved.

Keywords: Community of Inquiry, blended learning, learning design, online teacher training, course design

1. Introduction / background

Innovation in higher education has been promoted as an imperative, some of the challenges accentuating the urgency of change being the evolution of sophisticated Internet technologies, the new generation of learners, the demands of the global knowledge economy, and the shock of the current economic crisis.

With current advances in technology, the change of paradigm becomes more feasible in more fundamental ways. E-learning in its various forms has been promoted as a catalyst for change in higher education, on the ground of a range of arguments of socio-economic nature (Bates, 2005). In this line of action, almost the totality of higher education institutions have adopted Learning Management Systems (LMSs), digital platforms used for pedagogical and administrative purposes which offer a standard 'one size fits all' e-learning solution at most universities (Steel & Levy, 2009). However, research on LMS use over the past 20 years has pinpointed the fact that they replicate the dominant paradigm of industrial e-learning, a model characterising the first stages of e-learning development, imposing an inherently hierarchical structure that is based on a top-down, uni-directional flow of power and communication on the educational environment. This approach has been characterised by Tony Bates, a pioneer educator and e-learning systems designer as the «*black box educational philosophy*» (Bates, 1986, p. 432).

An alternative to the «black box» metaphor is the «network» metaphor (Harasim et al, 1995), representative of a completely different educational rationale. The computer, under this lens, is a channel of communication

Reference this paper as: Katerina Makri, Kyparisia Papanikolaou, Athanasia Tsakiri et al "Blending the Community of Inquiry Framework with Learning by Design: Towards a Synthesis for Blended Learning in Teacher Training" *The Electronic Journal of e-Learning* Volume 12 Issue 2 2014, (pp183-078) available online at www.ejel.org

between the tutor and the students through which the orchestration of learning is mediated. (Bates, *ibid*., p. 45).

A technological solution supporting the «network metaphor» is the integration of participatory web technologies (Web 2.0) into existing organisational infrastructure. It is argued that Web 2.0 could enable universities to "reinvent" themselves through more collaborative and learner-centred approaches to learning, innovations in teaching practices, and improved quality of student learning (Conole & Alevizou, 2010).

A pedagogical solution supporting a more open metaphor for online learning is based on the notion of communities. Communities fully or partially supported by digital tools have found fertile ground in the field of teacher education, either as components of broader training mechanisms, or as means of delivery of distance education *per se* (Najafi & Clarke, 2008). Their development has been related from the early 90s with effective professional development and substantial professional discourse (Darling-Hammond & Ball, 1997). The added value of communities – based on a review of 14 in service programmes by Zhao & Rop (2001) and another of 24 academic and in service programmes by Barnett (2002) - lies in:

- the modulation of teacher isolation
- the exchange of ideas and experiences
- the dissemination of innovative practices and teacher support throughout their implementation
- the development of interest groups around pedagogical issues
- the facilitation of reflective dialogue around teaching

In a nutshell, rhetoric related to the infusion of innovation in higher education brings to the forefront notions such as collaboration, communication and reflection in communities.

The scope of the research presented in this article relates to the aforementioned issues by proposing a synthesis of perspectives for the purpose of designing and implementing a blended learning approach in teacher training. Adopting Garrison and Vaughan's (2008) definition of blended learning as an "organic integration of thoughtfully selected and complementary face-to-face and online approaches and technologies", we attempt to articulate a framework including elements from the Community of Inquiry framework for meaningful online learning (COI), (Garrison et al, 2001) and the "Learning by Design" approach to designing learning activities (Kalantzis & Cope, 2012). Based on this approach, the six-month introductory course in Technology Enhanced Learning was designed by the School of Pedagogical and Technological Education (ASPETE) research team, located in Athens and implemented with 18 students of Informatics at the Higher Education Technological Institute (TEI) of Lamia, located in another geographical area of Greece. The discussion of this experience is supported by a dataset including students' answers to a COI-based questionnaire and asynchronous discussion transcripts, providing evidence about the potential of the approach and pointing out issues that need to be improved.

2. Towards a synthetic framework for blended learning

2.1 Pre service teachers as designers

Today's generation of young teachers are digital natives (Prensky, 2001), used to communicating with peers on a regular basis through multiple Internet technologies, cell phones, and other handheld tools. They have also been raised and educated in the modern western world where a common contemporary image of professionalism is collaborative group work: professionals sharing their experience, knowledge and expertise to solve complex problems.

New teachers are expected to adopt fundamental changes in the way they carry out their professional duties, many of which relate to the integration of digital technology in their teaching (Beetham, 2008). The management of technology-supported classroom investigations is logistically difficult, compounding the already existing challenges posed to teachers by student-driven classroom work, e.g. task management, providing individual guidance to several students simultaneously, and coordinating students who work at different paces (Edelson, 1998). A paradox, however, impeding smooth integration of already acquired ICT skills in teachers' practices lies in the fact that, though studies in OECD (Organisation for Economic Co-operation and Development) countries place teachers amongst the most skilled technology users, they appear

unable to take advantage of their competence and apply it to the way they teach (OECD, 2008). Especially with regards to Web 2.0 tools, it is striking to note that, despite their proliferation of their added value in educational literature (Redecker, 2009), there is very little work that examines how educators might make sense of the wide range of Web 2.0 tools available in the context of learning design, so that they can appropriately select and apply Web 2.0 tools that match the learning requirements of their curriculum (Bower et al, 2011).

As suggested by Beetham (*ibid*.), the integration of ICT fosters a more 'planful' and even 'design-like' attitude on behalf of practitioners, who suddenly have to make explicit many aspects of their practice that would emerge ad hoc in a live learning environment. Inline with this view and gaining momentum from a training standpoint are approaches centering on teachers' design practices. A characteristic of design-based teacher training activities is the acknowledgement of the importance of "*pedagogical design capacity*"– (PDC), a term used by Brown (2009), to describe "*teachers' capacity to perceive and mobilize existing resources in order to craft instructional contexts*". A promising framework focusing on PDC and acknowledging the complexity of design tasks is the Technological Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006). TPACK, apart from clearly defining the elements of teacher knowledge (T=technological, P=pedagogical, C=content) also promotes and values the very specialized form of teacher knowledge, which lies at the intersection of pedagogy, content and technology and is paramount when grappling with design tasks. This integrated construct offers new options for looking at the complex phenomenon of technology integration inways, that are amenable to analysis and development (Jimoyannis, 2010).

The move to design-based activities has implications for trainee-teachers, as well as instructors (Mishra & Koehler, 2006).

With regards to trainees, they have to engage in the construction of artefacts, which is often located in the interplay between theory and practice, between constraints and trade-offs, between designer and materials and between designer and audience (Mishra & Koehler, 2003). Trainees actively engage in practices of inquiry, research and design, in collaborative groups to design tangible, meaningful artefacts as end products of the learning process (Blumenfeld et al., 1991). The actual process of design is the anchor around which learning unfolds. This evolving artefact is also the test of the viability of individual and collective understandings, conceptions and ideas of the learning design project undertaken by the class.

With regards to teacher educators, design cannot be taught in conventional ways: design is experienced in activity, design depends on recognition of design quality, it entails a creative process, it is understood in dialogue and action, and involves reflection in action (Mishra, Zhao, & Tan, 1999; Schon, 1987).

2.2 The Community of Inquiry framework as a means to organise virtual classroom communication

The Community of Inquiry framework (COI, Garrison et al, 2001), based on John Dewey's progressive understanding of education is a process model of online learning which addresses the online educational experience as a result of the interaction of three presences – social presence, cognitive presence, and teaching presence (Swan, Garrison, & Richardson, 2009). Participation in a COI involves the (re) construction of experience and knowledge through the critical analysis of subject matter, questioning and challenging of assumptions. This definition is based on the premise that an educational learning experience is both collaborative and reflective.

The COI instrument consists of three separate coding schemes to identify each kind of social, cognitive, and teaching presences in textual discourse.

In particular, social presence is the ability of the participants in the COI to project their personal characteristics into the community, thereby presenting themselves to the other participants as 'real people' (Garrison et al., 2000, p. 94). Social presence is a support for cognitive presence. The social presence coding scheme has three categories: affective, open communication and group cohesion. These categories are defined "in terms of the participants identifying with the community, communicating purposefully in a trusting environment and developing interpersonal relationships" (Garrison, Anderson, & Archer, 2001, p. 7).

Cognitive presence "is the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry" (Garrison, Anderson, & Archer, 2001, p. 5). The scheme has four categories: triggering event; exploration; integration; and resolution. They represent the phases of an inquiry process in a collaborative learning environment. Triggering event is the initiation phase of a critical inquiry where an issue, dilemma or problem is identified or recognized. The next phase is exploration, where learners tend to grasp the nature of the problem and move to explore relevant information. In the integration phase learners construct meaning from the ideas generated in the exploratory phase. The last phase of the critical inquiry model is resolution, which indicates a resolution of the dilemma or problem that caused the triggering event.

Teaching presence comprises of "the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" (Anderson et al., 2001, p. 5). The scheme has three categories: The first category, “design and organization” represents one of the three core teaching responsibilities: establishing curriculum content, learning activities and timelines. The second category, “facilitating discourse” relates to the monitoring and management of purposeful collaboration and reflection. Finally, the third category, “direct instruction” ensures that the community reaches the intended learning outcomes by diagnosing needs and providing timely information and direction (Garrison, Cleveland-Innes & Fung, 2010).

The COI is a generic theoretical framework that must be viewed as a means to study collaborative constructivist educational transactions – be they in online, blended or face-to-face environments. The validation of this framework would also suggest that it can also be used as a rubric to test for functioning communities of inquiry (Garisson, 2011). Recent research has also employed the COI framework as an informing design rationale for online instructional design of educational experiences (Fusco et al, 2011; Shea & Bidjerano, 2009). For the purposes of our research, the COI framework is used both as a design tool, and as an mechanism for evaluating the effectiveness of an online blended course addressed to student-teachers.

2.3 Using the LbD framework as a pedagogical design tool

To cultivate a “design-like attitude” in our audience of pre-service teachers, focusing, at the same time, in their PDC and TPACK knowledge, we employed the Learning by Design framework (LbyD, Kalantzis & Cope, 2012) as a pedagogical design tool for teachers. Its function was that of a common language among teachers, so as to enable communication through the co-construction of learning environments enhanced with technology. The framework introduces eight ‘knowledge processes’ (i.e. types of activities) (Kalantzis & Cope, 2012): (i) Experiencing the known, (ii) Experiencing the new, (iii) Conceptualizing by naming, (iv) Conceptualizing with theory, (v) Analyzing functionally, (vi) Analyzing critically, (vii) Applying appropriately, and (viii) Applying creatively. The mindful and appropriate deployment of the range of Knowledge Processes through a course is intended to foster higher order thinking skills and deeper learning for students. For student-teachers, the mapping of these processes to specific activities and digital tools functions as a design awareness enhancement mechanism, aiding the meaningful integration of ICT in their learning designs. For example, a lesson design including the use of a Web 2.0 tool should also include at least one knowledge process pursued by the use of the a Web 2.0 tool, realized through a suitable activity. Thus, a student-teacher’s design should include: a Web 2.0 tool (e.g. a wiki), used in a respective activity (e.g. collaborative writing) promoting one or more knowledge processes (e.g. analyzing critically): for example: students use a wiki to collaboratively compose an essay, in order to critically analyze, through group discussion and negotiation of the essay contents, the effects of global warming.

3. Research design

In the design rationale proposed in this section for training pre-service teachers on Technology Enhanced Learning, we adopt a view of teachers as designers of innovative content working individually and collaboratively, discussing and interacting with the instructors and their peers, both online and in face to face (f2f) settings. This rationale guided a six-month pre-service teacher-training course on Technology Enhanced Learning, provided by ASPETE in collaboration with TEI of Lamia, in the context of the graduate program in Informatics, taking place in Lamia. The course took place between September 2012 and January 2013 with 18 pre-service student-teachers as participants. The course builds on participants’ content knowledge, considered a prerequisite, as it is their third year of specialisation in Informatics. It is based on the concept of learning design throughout its duration, this translating in practice in the process of collaborative work towards the

development of a tangible and usable learning design in their field of expertise, properly addressing their future students. Adopting a project-based approach, this final group deliverable would be in the form of a WebQuest. The following sections (3.1-3.4) refer to specific ways participants' co-construction of learning designs was supported throughout the course.

3.1 Structure of WebQuests/learning designs

The design template participants were provided with is the WebQuest scheme (Dodge, 1995). Underlying the WebQuest strategy is a central inquiry-oriented activity that is described in a web-based format (Abbit & Ophus, 2008). The content of a WebQuest activity is divided into several sections, including: (a) Introduction, (b) Task, (c) Process, (d) Evaluation, and (e) Conclusion. Core elements that form a part of every WebQuest are a scaffolding structure that encourages student motivation and facilitates advanced thinking with integration of an enriched set of learning resources (March, 2007).

3.2 Pedagogy underlying WebQuests/learning designs

The Learning by Design framework (LbyD, see section 1.1, Kalantzis & Cope, 2012) is used as a common language among teachers to enable communication and co-construction of learning environments enhanced with technology.

3.3 Technology integration in WebQuests/learning designs

Two representative categories of Web 2.0 tools are used by trainees as objects to be integrated in their WebQuest learning designs. These are a) representation tools, such as timelines, wordclouds and concept mapping tools and b) digital storytelling tools, such as comics and interactive posters.

3.4 Orchestration of teacher training activities on the basis of cognitive and teaching presence

Moodle is used as the main technological infrastructure where the learning experience sits on. Throughout 12 weeks, participants complete individual assignments, form small (3-member) groups and work in collaborative assignments, participate in online asynchronous discussions and teleconferencing sessions, as well as in f2f workshops inbetween. The online discussions take place in parallel to the f2f workshops and teleconferencing sessions, at specified times. F2f workshops were under the responsibility of the TEI of Lamia staff, whilst online discussions and teleconferencing sessions were led by ASPETE staff.

With regards to cognitive presence, the course is organised on the basis of the hypothesis that a learning design experience can align with the same cognitive process described by Garrison *et al* (2001). Specifically, the triggering event is the design problem posed to participants during the first two weeks of the course. There follows a quite extended period of exploring ideas and studying digital and pedagogical tools and resources, in order to craft an instructional rationale around the chosen theme of their WebQuest. Integration is expected to start manifesting towards the final weeks of the course, when participants have produced a first draft of their designs and are in the process of synthesizing their complementary expertise in order to reach a final product, represented by the resolution phase, during the final two weeks of the course. Table 1 maps course topics to respective activities.

With regards to teaching presence, we view it as supporting the process of design and the respective cognitive process dictated by the COI model in the ways shown in Table 1. Specifically with regards to the first two weeks, the dominant teaching presence category was that of design and organisation: participants were introduced to the Moodle platform, created their online profiles, engaged in an introductory conversation about their expectations from the course and were also acquainted with the course syllabus and activities. Design and organisation co-existed with the triggering event stage of cognitive presence. During the core weeks of course (weeks 3 – 8), teaching presence focused on a synthetic effort both to facilitate discourse and to directly instruct. The latter is manifested through presentations in f2f workshops and in teleconferencing sessions, whilst the first was a continuous input in online discussions taking place in parallel to the f2f meetings. Finally, during the final weeks of the course (9-12), we believe teaching presence mostly facilitated discourse: prompted discussion, reinforced student contributions, sought consensus / understanding, clarified ambiguities and resolved issues.

Social presence was encouraged mostly through the f2f workshops, from the moment participants were introduced to the course tasks and rationale, to the moment they were split into small groups and finally, to the moment they delivered their final learning designs as WebQuests. However, as some of the participants didn't know each other, the first discussion lasting for the first two weeks was an opportunity for them to socialize online and get to know each other, while they were becoming familiar with the onine environment.

Table 1: Mapping of teaching and cognitive presence to course items

Week	Topic	Learning Activity	Cognitive presence stage	Teaching Presence categories
1	Presentation of the Moodle environment Presentation of the WebQuest structure and WebQuest examples	Teleconferencing session Online: students introduce themselves and talk about their expectations from the course	Triggering event	Design and organisation
2	Building a website for the WebQuest	F2F workshop	Triggering event	Design and organisation
3,4,5	Web 2.0 tools: 1) graphical representations (word clouds, timelines, concept maps) 2) digital story telling (comics, interactive posters)	3 F2F Workshops Students work on specific mini-deliverables, i.e. artefacts constructed with selected Web 2.0 tools Online: discussion on the usefulness and appropriateness of the pedagogical use of various Web 2.0 tools for students' discipline	Exploration	Direct instruction Facilitating discourse
6	Choosing a topic (curriculum-based, from school textbooks or interdisciplinary)	F2F Workshop Students search specific sites (e.g. search for curriculume standards at the Ministry of Education or browse teacher community sites) and deliver a first draft of their design, including the theme of their WebQuests and baseline information on their design rationale.	Exploration	Direct instruction Facilitating discourse
7	Designing activities for their WebQuest, based on the Learning by Design framework	Teleconferencing session Online: discussion on mapping specific learning activities (according to the LbD framework) to Web 2.0 tools	Exploration	Direct instruction Facilitating discourse
8	Searching for appropriate Web material (sources) for their WebQuest	Students explore learning object repositories and selected educational sites (national & international) Online: posting at least two web resources they consider useful and pedagogically appropriate and commenting on them	Exploration/ Integration	Facilitating discourse
9	Editing multimedia materials (images and sound) for their Webquests	F2F Workshop	Integration	Facilitating discourse

Week	Topic	Learning Activity		Cognitive presence stage	Teaching Presence categories
10	Group work for completing projects	F2F Workshop	Online: discussion of final project drafts and feedback	Integration	Facilitating discourse
11	Group work for completing projects	F2F Workshop		Resolution	Facilitating discourse
12	Presentation of projects	Teleconferencing session		Resolution	Facilitating discourse

4. Research questions and scope

Using the metaphor of a "learning ecology" introduced by Cobb et al (2003), our research adopts the rationale of the Design Research paradigm. According to Cobb et al (:9, ibid.):

> *"Elements of a learning ecology typically include the tasks or problems that students are asked to solve, the kinds of discourse that are encouraged, the norms of participation that are established, the tools and related material means provided, and the practical means by which classroom teachers can orchestrate relations among these elements".*

After organising the above elements in a time continuum and translating them into a coherent syllabus, the research questions articulated were:

- What is the nature of online discussions evolving around complex design tasks addressed to pre service teachers?
- Can the COI analytical framework support course design? Which of its elements can be best employed as course design tools?

5. Data collection and analysis

Data collected include asynchronous discussion transcripts, students' answers to a COI-based questionnaire, free-text student feedback, and final students' products in the form of learning designs/WebQuests, integrating the use of technology. In this article we focus on asynchronous discussion transcripts and students' answers to the COI-based questionnaire.

In particular, we collected all the messages posted to the 5 discussions organized throughout the course and attempted to categorize them in relation to the phases of cognitive presence, i.e. triggering event, exploration, integration, and resolution, although some of them could belong to more than one phases. This was the first analytical instrument used, to identify and evaluate the degree of higher order thinking taking place while participants collaboratively design, using pedagogical and technological tools.

The themes of the discussions were the following:

- 1st discussion: introductory activity (who I am and what I expect from the course)
- 2nd discuccion: which Web 2.0 tools (from a range of two broader categories) seem useful and appropriate for pedagogical use in our discipline?
- 3rd discussion: our first learning design/WebQuest draft: our theme and design rationale: inter and intra-group discussion and feedback from tutors and peers
- 4th discussion: posting at least two web resources considered useful and appropriate from a pedagogical point of view and commenting on them
- 5th discussion: our final learnig design/WebQuest draft: our full WebQuest, containing activities integrating Web 2.0 tools and knowledge processes: inter and intra-group discussion and feedback from tutors and peers.

We also used the COI evaluation instrument, a survey tool designed to measure student perceptions of each of the three presences (Swan et al., 2008; Swan et al, 2012). The 34-item COI survey instrument was employed to evaluate the contents, the structure and the activities of the course, under the elements of the COI construct: teaching, social and cognitive presence.

The survey consists of 34 items, 13 for teaching presence, 9 for social and 12 for cognitive presence. Responses to the items were to be provided on a five-point Likert type scale ranging from 1=strongly disagree; 5=strongly agree. Fourteen out of eighteen students completed the particular questionnaire. In the analysis phase we calculated percentage scores for each item.

6. Findings and discussion

6.1 On the nature of online discussions evolving around complex design tasks addressed to pre service teachers

In order to approach the first research question, we examined the progression of cognitive presence based on discussion transcripts. In particular, cognitive presence in online discussions was first examined through mapping the quantity of participants' comments to the five respective discussions throughout the course (figure 1).

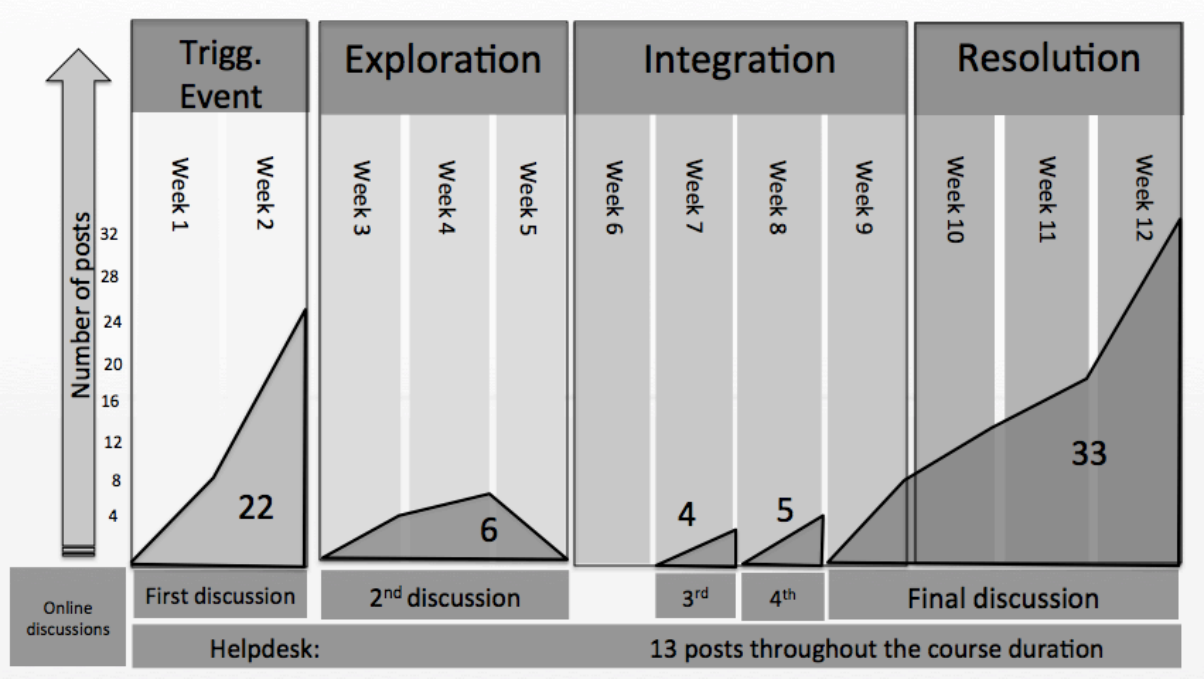

Figure 1: Mapping comments to course discussions

A total of 83 contributions (messages and posts) were published during the 12 weeks of the course. The 13 posts to the helpdesk related to technical issues such as platform use, uploading of assignments, embedding learning objects, etc.

The triggering event was posed to the class on the day of their first f2f workshop. There followed the first online discussion, which lasted for the following two weeks. The first 22 participants' posts in the first discussion were mostly of a social nature, representing participants' need to acquaint themselves both with the medium of communication and with each other and the tutors.

The second, third and fourth discussion forums were in operation during the core weeks (3-9) of the course. Written transcripts from this period were expected to indicate elements of exploration, gradually leading to integration. However, these three forums weren't densely populated, as shown by the scarce comments during the respective weeks and the nature of the posts they hosted was in most cases exploratory. Indicative, of the exploratory character of most posts during the middle weeks of course (discussions 2, 3 and 4), are the following posts:

> *"How exactly are we to integrate Web 2.0 tools with specific knowledge processes? They don't fit with our design"*
>
> *"Here is a web link we found useful for our students".*

The first post brings to the front a pedagogical issue troubling the group, whilst the second one is in fact a statement of something the group did. Neither posts received feedback other than that of the tutor's and both belong to what has been referred to in the literature as "serial monologues".

The final discussion took place within each group, expected to coincide with the resolution phase of the cognitive presence process. However, integration seems to have been achieved only to a certain extent during weeks 10-12. Indicative of the integration phase is the following comment from the final discussion, 7th in a thread of 8 comments, 4 by the tutor and 4 by the student group. The comment is a reply to the tutor's prompt to articulate which knowledge processes are activated in the group's WebQuest, and which Web 2.0 tools are used towards this purpose:

> *"We thought we had finished our WebQuest at the second lesson when we developed the WebQuest site with all its sections, but that was before the session about Learning by Design and knowldege processes. After this lesson, we tried to change the WebQuest so as to include as much knowldege processes as possible, with respective Web 2.0 tools. For example, by getting students to use the timeline, we think we activate the "conceptualising with theory" process. And by getting them to publish their presentations on Slideshare, we activate the "applying appropriately" process. Finally, we put a chat, with which we think we activate the "analysing critically" process, but we aren't sure we'll keep this".*

The above comment from the 5th discussion indicates the end of a long exploration towards integrating all members' opinions and ideas to the purpose of a final proposal.
Another group's comment from the 5th discussion, 3rd in a thread of 4 comments, is of a more exploratory nature, approaching, however, integration:

> *"I agree with [name], because after a lot of debate, we tried to fit more activities in our WebQuest fields. But I still don't agree about the use of a blog. I think classroom discussion would be much more interesting for the pupils".*

The group participants, in this message, seem overwhelmed by the effort to match educational goals to specific Web 2.0 tools and indicate this by declaring the main point of a disagreement within the group.
The comment below was posted during week 11 and is declarative of the final design decisions of the group. It appeared after tutor feedback related to enriching the Webquest with student-centred activities such as chat and forum discussions.

> *"We, too, think that the wordcloud, the comic and the digital poster are not sufficient. So we added a chat after the "Introduction" of the Webquest, to allow students to absorb through discussion the new information they are given with the word cloud. We also added one forum for each group of students in the "Process" field of the Webquest, to enable them to collaborate online, and us to monitor their work"*

This message indicates that the group members had already grappled with the design challenge of integrating three basic Web 2.0 tools (a comic, a wordcloud and a digital poster) into their Webquest and were, at this point, ready to expand their design so as to include more student-centred interactions, such as an asynchronous activity (forum) and a synchronous one (chat).

results from students' answers to the COI evaluation instrument are presented and discussed in this section.

6.1.1 Teaching Presence

Below are the 13 first items of the survey representing the different facets of teaching presence from the students' point of view. The average score of the 14 participants' answers is 4 (agree). Students seem to be satisfied from teacher involvement with a slight difference in timely feedback. We could suppose that when students use asynchronous forums for learning they prefer not just timely but immediate support.

The instructor clearly communicated important course topics.	4
The instructor clearly communicated important course goals.	4
The instructor provided clear instructions on how to participate in course learning activities.	4
The instructor clearly communicated important due dates/time frames for learning activities.	4
The instructor was helpful in identifying areas of agreement and disagreement on course	4

topics that helped me to learn.	
The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.	4
The instructor helped to keep course participants engaged and participating in productive dialogue.	4
The instructor helped keep the course participants on task in a way that helped me to learn.	4
The instructor encouraged course participants to explore new concepts in this course.	4
Instructor actions reinforced the development of a sense of community among course participants.	4
The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	4
The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.	4
The instructor provided feedback in a timely fashion.	3.6

Table 2: Teaching Presence items and average of participants' answers

6.1.2 Social Presence

The following 9 items of the survey related to social presence are presented in table 3. The average is again 4. However, the participants don't seem to fully embrace the view that the online medium was excellent to the purpose of social interaction. There is also an expressed doubt related to the sense of trust and the expression of disagreement. Both findings can be interpreted on the basis of the blended character of the course. Though teacher trainees used the online facilities, they only did so systematically at the beginning and towards the end of the course. This is due to the fact that many issues were resolved in face-to-face settings, during the workshops. Another characteristic of the course design probably empeding the development of online social presence was the intensive rhythm of the group activities, as well as the demanding deliverables expected by the groups.

Getting to know other course participants gave me a sense of belonging in the course.	4
I was able to form distinct impressions of some course participants.	4
Online or web-based communication is an excellent medium for social interaction.	3
I felt comfortable conversing through the online medium.	4
I felt comfortable participating in the course discussions.	4
I felt comfortable interacting with other course participants.	4
I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.	3
I felt that my point of view was acknowledged by other course participants.	4
Online discussions help me to develop a sense of collaboration.	4

Table 3: Social presence and average of participants' answers

6.1.3 Cognitive Presence

The average of participants' answers to the next 12 items of the COI survey representing the progression of cognitive presence is presented in Table 4 below. The finding derived from participants' discussion transcripts, that cognitive presence didn't culminate in the expected integration phase, but rather towards the end of the course, at the phase expected to be the resolution phase, is verified by participants' average (3). This indicates uncertainty with regards to high level learning outcomes predicted at the final stages of the cognitive presence cycle. While participants seem to have been initially motivated by the triggering event (the project on collaboratively designing a WebQuest), as indicated by increased social presence and participation in the first online discussion, subsequent online activities seem to have discouraged students' online expression. Students also acknowledge having gained useful practice-based knowledge (statement 34), though they don't seem to equally value their final products (statement 33).

Problems posed increased my interest in course issues.	4
Course activities piqued my curiosity.	4
I felt motivated to explore content related questions.	3
I utilized a variety of information sources to explore problems posed in this course.	3
Brainstorming and finding relevant information helped me resolve content related questions.	3

Online discussions were valuable in helping me appreciate different perspectives.	3
Combining new information helped me answer questions raised in course activities.	3
Learning activities helped me construct explanations/solutions.	3
Reflection on course content and discussions helped me understand fundamental concepts in this class.	4
I can describe ways to test and apply the knowledge created in this course.	3
I have developed solutions to course problems that can be applied in practice.	3
I can apply the knowledge created in this course to my work or other non-class related activities.	4

Table 4: Cognitive Presence and average of participants' answers

7. In conclusion

Our findings pinpoint a recurring issue in the literature of asynchronous online communication, that inquiry invariably has great difficulty moving beyond the exploration phase (Garrison, 2007; Diaz, Swan & Ice, 2010). No significant difference from this finding emerged from our findings, despite the focus on a complex design task. One of the empediments to reaching integration at an earlier level has to do, we believe, with the themes of the discussions taking place during the core weeks of the course. As these were not directly related to the product in progress, participants avoided to participate, prefering, instead, to work in groups during f2f workshops.

Redesigning the course for the next academic year is currently in progress, and so is another similar course taking place at the moment in ASPETE. The preliminary findings reported in this paper point to changing the nature of tasks during weeks 3-8 ("exploration and integration phases" and infusing more asynchronous conversation and respective moderation strategies. Boosting online discussions can be achieved by directing participants towards more design-like tasks, i.e. activities that are directly related to the deliverable they are collaboratively preparing, like, fore example, posting separate "drafts" of their learning designs and receiving feedback from the tutors and peers.

With regards to teaching presence, facilitating discourse will (during weeks 3-8) in some instances, be prioritised over direct instruction, as some of the tasks have proven too restrictive for the students to allow them room for opinion sharing and discussion. Another parameter considered is social presence. This hasn't been a design guideline so far, on the premise that the course already accounted for participants' social accounts during f2f meetings. However, elements in trainees' discussions in all threads indicate a tendency for online socialization, worthy of further investigation.

Acknowledgements

The research "Design, Implementation and Evaluation of Blended Learning Scenarios in a Teacher Training Context accommodating their Individual Psychological Characteristics (BleSTePsy)" is implemented through the Operational Program "Education and Lifelong Learning" and is co-financed by the European Union (European Social Fund) and Greek national funds.

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