WCES-2010

Web-enhanced learning scenarios

Kyparisia Papanikolaou[a]*

[a]*Department of Education, School of Pedagogical and Technological Education, Athens, Greece*

Abstract

There are various perspectives on how to blend face to face with on line experiences as well as on the rationale for blending face-to-face learning with technology. In this paper we focus on how collaborative scripts may inform the design of blended learning with specific cognitive and meta-cognitive objectives. To this end, we present several web-enhanced learning scenarios that combine individual and collaborative activities, involve various e-learning tools aiming to provide a supporting blended learning context at higher education. The description of the scenarios includes activity sequencing, type of activities, role distribution, objectives, and available tools/resources.
© 2011 Published by Elsevier Ltd. Open access under CC BY-NC-ND license.

Keywords: learning design; blended learning; collaboration scripts

1. Introduction

Blended learning is considered as a thoughtful fusion of face to face and online learning experiences expanding the 'classroom' beyond place and time restrictions into fields of authentic practice and even into the student's own environment (Osguthorpe and Graham, 2003). However, there are various perspectives on how to blend face to face with on line experiences (Allen et al., 2007; Garrison & Vaughan, 2008) and on the rationale for blending face-to-face learning with technology such as improved teaching and learning outcomes, increased flexibility in and access to learning.

Designing for blended learning in various contexts is a quite challenging process when aiming to sustain different types of objectives such as cognitive, meta-cognitive, and social. To this end, research in the area of Computer Supported Collaborative Learning is a valuable resource. Collaboration scripts may be used as an instructional support aiming at a higher quality of both collaborative learning processes and individual learning outcomes (Dillenbourg & Hong, 2008). They have been used to structure both face-to-face and computer-mediated collaboration aiming to specific cognitive and meta-cognitive objectives (Kollar et al., 2006). Blending both types of interaction, the aim is twofold: to engage students in activities that are specifically related to individual knowledge acquisition as well as to facilitate communicative-coordinative processes that occur among group members.

Learning design is the process of 'designing planning orchestrating and supporting learning activities' (Beetham, 2007). Particularly, to design scripts requires the purpose of the course to be negotiated and made explicit. This process prompts for several cycles of refection, negotiation, adaptation for those designing learning. This is a dynamic process considering also that in several cases scripts need to adapt on the fly during 'run-time'. Moreover,

---

in the case of blended learning, the digital tools used to allow and enable students interaction, access to resources, content delivery, etc. should be appropriately selected to support the underlying objectives (Conole et al., 2004).

In this article we present several web-enhanced learning scenarios that combine individual and collaborative activities, involve various e-learning tools aiming to provide a supporting blended learning context at higher education. Various types of web-based tools/learning environments are used to enable students' interaction, and support them in organizing their work as well as in learning design activities. The description of the scenarios is based on collaboration scripts (Kollar, et al., 2006) adapted to a blended learning context. For each scenario the activity sequencing, type of activities, role distribution, objectives, and available tools/resources, are presented.

2. Blended Learning Scenarios

In this section we present blended learning scenarios of two main categories those that face learners as: (a) learning designers of e-learning courses, adaptive content, as well as Web Quests, and (b) students working and reflecting on activities prepared by expert-teachers such as project-based activities.

2.1. Learning design experiences

E-learning design. In this scenario (see Figure 1), postgraduate students, attending a course on distance learning, worked individually and in groups in order to evaluate and develop e-learning courses. In particular, they initially worked as *students* in a distance learning course undertaking specific activities, then as *expert-reviewers* evaluating e-courses according to principles for developing content for distance learning, as well as pedagogical and technical criteria. Finally, students worked as *learning designers* developing courses based on their own learning design proposal. At the end, they completed a questionnaire evaluating their learning experience. The scenario lasted about one semester.

Throughout the scenario, the students worked with various e-learning tools exploring alternative learning designs, such as Moodle or LAMS, the Adaptive Educational Hypermedia System INSPIRE (Papanikolaou et al., 2003) and INSPIRE *Auth for* authoring adaptive content (Papanikolaou and Grigoriadou, 2009). INSPIRE *Auth* supports authors to use the authoring cycle for modularizing and organizing the domain knowledge based on the learning design implied by INSPIRE. The forum of an e-class environment of the particular course was used as a helpdesk.

Activity Sequencing	Type of activity	Role	Objectives	Resources/Tools
Learners select a course provided free by the Open University of UK (OpenLearn) and undertake two activities proposed in the content	Individual	Students	Introduce learners to • principles for developing content for distance learning • activity-based learning design	Open University http://openlearn.open.ac.uk
Learners are introduced to principles for developing content for distance learning	Face to face	Students		Presentations, articles
Learners evaluate the content of the OpenLearn course they had previously worked with, using a rubric for evaluating content for distance learning	Individual	Reviewers		Open University http://openlearn.open.ac.uk Evaluation rubric
Learners are introduced to Moodle. They work in groups to develop a prototype and get acquainted with basic tools.	Face to face Collaborative	Students	Introduce learners to • contemporary LMS that are based on activities • learning design issues	Moodle documentation
Learners are introduced to LAMS working in a synchronous e-learning platform with the tutor and learners not located in the same place	Synchronous e-learning activity	Students		LAMS documentation, Synchronous e-learning platform (Centra)
Learners design and develop e-content based on distance learning principles using LAMS or Moodle	Collaborative	Domain experts, Learning designers		Moodle/LAMS

Learners design and develop an adaptive course for INSPIRE based on the inquiry-based learning design model	Collaborative	Domain experts, Learning designers	Introduce learners to domain knowledge modularity Increase awareness of the individual learning characteristics of the target group	INSPIRE, INSPIRE*Auth*
Students reflect on the authoring experience and complete an evaluation questionnaire	Individual	Students	Reflect on the adaptive content authoring process	Evaluation questionnaire

Figure 1. Designing e-learning content scenario

WebQuest authoring. In this scenario (see Figure 2) undergraduate students design and develop WebQuests using Web 2.0 tools. In this process they are supported through a particular sequence of activities to deal with critical pedagogical and technical issues in designing WebQuests. The scenario lasted about one month.

According to March (2007) "a WebQuest is a scaffold learning structure that uses links to essential resources on the World Wide Web and an authentic task to motivate students' investigation of an open-ended question, development of individual expertise, and participation in a group process that transforms newly acquired information into a more sophisticated understanding". In this scenario, the WebQuest approach was selected as adequate for students to reflect on pedagogical issues underlying the design of web-based learning and resource-based learning, as well as a scaffold for students' use of Web 2.0 environments.

Students were organized in groups according to their individual characteristics (knowledge level & learning style) through the group formation tool MyTeam. MyTeam organizes learners in groups with specific characteristics and provides access to the profiles of those group members that allow it. All the group discussions took place through the forum of the course e-class. In those cases of group members with low participation we intervene to reorganize groups while the script was on progress.

Activity Sequencing	Type of activity	Role	Objectives	Resources/Tools
Learners are introduced to WebQuests	Face to face	Students	Learners are introduced to guided discovery learning, information literacy	Samples of WebQuests on the Internet Presentations, articles
Learners evaluate WebQuests using a rubric for evaluating pedagogical & technical aspects	Asyncronous e-learning activity		Learners identify good practices in developing webquests based on a constructivist theoretical background	WebQuest evaluation rubric
Learners • complete the 'Index of Learning Styles Questionnaire' to identify their style based on Felder & Silverman (F&S) categorization • complete their profile to the group formation tool MyTeam concerning their learning style and knowledge level on the subject	Individual	Students	Enhance learners awareness about their learning style	MyTeam
Learners are informed about their groups and the personal characteristics of their peers	Individual	Students	Enhance learners awareness about the characteritiscs of their group	MyTeam
Search for adequate resources for the topic and the target group of students. Discuss and decide on the topic of the WebQuest.	Collaborative	Students	Cultivate information literacy skills	Asynchronous Forum
Design of main components of a WebQuest scenario: deciding on students' roles, class organisation, type and sequence of activities,	Collaborative	Learning designers	Learners • acknowledge the main components of a	WebQuest resources Asynchronous Forum

			WebQuest • reflect on pedagogical ideas behind guided discovery and authentic evaluation approaches	
Learners develop WebQuests using wiki & argument about the learning design	Collaborative	Learning designers	Learners use tools for developing WebQuests proposing their own learning design	Instructions, wiki environment documentation
Learners reflect on their learning experience and evaluate wikis as a tool for promoting interaction in a WebQuest senario	Individual	Students	Reflect on the learning design process	Evaluation questionnaire

Figure 2. WebQuest authoring scenario

2.2. Project-based learning experiences

In this project-based learning scenario (see Figure 3) undergraduate students work independently and in groups undertaking multiple roles with increasing complexity through the various stages of a project (Papanikolaou and Boubouka, 2010). Peer learning is encouraged through activities of various degrees of interaction, from collaborative activities to activities that promote sharing and commenting on peer proposals submitted in a shared database. In the particular scenario individual activities precede to the collaborative ones in order to promote sharing of individual reflective thinking with the group through collaboration. The scenario lasted about one month.

In particular, students worked on a project about computer programming using the learning environment of MyProject, whilst groups' discussions took place at the forum of the e-class environment of the course. In cases of collaborative activities with low participation (since some groups were randomly formed), we intervene to reorganize groups while the script was on progress. The scenario was mainly implemented through MyProject (Papanikolaou & Grigoriadou, 2009), a web-based adaptive learning environment that supports learners to progressively understand the implicit issues of a project by proposing learners a set of learning activities, organized as a learning cycle with several stages (Introduction, Generate Ideas, Multiple Perspectives & Research, Solution & Evaluation). Hypermedia educational content composed of authentic cases is also provided.

Activity Sequencing	Type of activity	Role	Objectives	Type of script representation/Tools
Learners get informed about the project (by a short and general description) and explore initial resources	Individual	Students	Introduce students to the project theme • Enhance learners' meta-cognitive knowledge of plans and goals, as well as task knowledge	MyProject, *Introduction stage*
Learners • answer the main driving questions of the project that represent the expected learning outcomes • get informed about their peers' contributions	Individual	Students	Recall prior knowledge/experiences & stimulate ideas generation • Provide peer support • Cultivate self-knowledge, strategic knowledge	MyProject: *Generate Ideas stage*
Learners study the content in order to deal with the different concepts involved in the project	Individual	Students	Identify concepts relative to the project • Provide peer support • Enhance learners' metacognitive task knowledge and in particular that subcategory connected to the information available	MyProject: *Multiple Perspectives & Research stage*

Students *work in groups* in order to define the project: ● discuss at the forum of the e-class the open issues of the project ● agree on specific goals to attain	Collaborative	Students	Set their own goals in the project definition	e-class Forum
Students develop and submit their own solution along with the definition of the project determined by the group	Individual	Students	Participate in a peer review process Enhance learners' metacognitive self, task and strategic knowledge and self assessment skills	MyProject: *Solution & Evaluation stage*
Students *work in groups* for establishing assessment criteria to evaluate peer products and the final project product	Collaborative	Reviewers		e-class Forum
Students review the solutions proposed by the rest members of their group based on the commonly agreed assessment criteria	Individual	Reviewers		MyProject: *Solution & Evaluation stage*
Students *work in groups* to develop a common solution to the project	Collaborative	Students		e-class Forum
Students revise their own solution to the project based on the review comments of peers	Individual	Students		MyProject: *Solution & Evaluation stage*

Figure 3. Project-based learning scenario

3. Conclusions

In the scenarios presented in this paper, students undertake several roles, search for resources, and use e-learning tools in order to solve authentic problems. The tools involved allow and promote alternative course designs, enable synchronous and asynchronous interaction. Various sources of feedback are also provided, coming from tutors, peers, and class. The scenarios interweave individual and collaborative activities enhancing peer learning opportunities. In the first two scenarios, learners are systematically engaged in authoring learning designs. This is a quite demanding process but also helpful in making learners speculate on several pedagogical and technical issues of the learning design process under a variety of pedagogical approaches. A challenge for designing scenarios that involve learners in the authoring process is to provide a supporting learning environment through the adequate digital tools, feedback, and activities sequencing. In the third scenario, students work on a project aiming to cultivate the necessary cognitive and meta-cognitive knowledge and skills. To this end, the structure and support provided by the e-learning environment and peers are quite critical.

References

Beetham, H. (2007). An approach to learning activity design. In: H. Beetham, & R. Sharple: *Rethinking pedagogy for a Digital Age*. Routledge.

Conole, G., Dyke, M., Oliver, M., & Seale, J. (2004). Mapping pedagogy and tools for effective learning design. *Computers and Education*, 43 (1-2), 17-33.

Dillenbourg, P., *&* Hong, F. (2008). The mechanics of CSCL macro scripts. *Computer-Supported Collaborative Learning*, *3*, 5–23.

Garrison, D., & Vaughan, N. (2008). *Blended Learning in Higher Education*. Jossey –Bass: A Wiley Imprint.

Kollar, I., Fischer, F., & Hesse, F.W. (2006). Collaboration scripts – A conceptual analysis. *Education Psychology Review*, *18*, 159–185.

March, T. (2007). Revisiting WebQuests in a Web 2 World. How developments in technology and pedagogy combine to scaffold personal learning. *Interactive Educational Multimedia*, 15, 1-17.

Osguthorpe, R. T., & Graham, C. R. (2003). *Blended learning environments: definitions and directions. The Quarterly Review of Distance Education*, 4(3), 227-233.

Papanikolaou, K., & Boubouka, M. (2010). Promoting collaboration in a Project-Based E-Learning context. *Journal of Research on Technology in Education (JRTE),* 43 (2), 135–155.

Papanikolaou, K., & Grigoriadou, M. (2009). Co-authoring personalised educational content: teachers' perspectives. In *Proceedings of the AIED 2009 workshop 'Enabling Creative Learning Design: How HCI, User Modelling and Human Factors Help'*, Brighton, UK.

Papanikolaou K.A., Grigoriadou M., Kornilakis H., & Magoulas G.D. (2003). Personalising the Interaction in a Web-based Educational Hypermedia System: the case of INSPIRE, *User-Modeling and User-Adapted Interaction*, 13 (3), 213-267.

Papanikolaou, K., & Grigoriadou, M. (2009). Combining adaptive hypermedia with project and case based learning. *International Journal of Educational Multimedia and Hypermedia,* 18 (2), 191-220.