

PROMOTING STUDENT PARTICIPATION IN AN ONLINE COURSE THROUGH PROBLEM-BASED LEARNING¹²

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The emergence of open source LMS platforms such as Moodle (Dougiamas & Taylor, 2002) have drastically expanded the scope of e-learning leading to a diversity of situations adjusted to specific educational demands. In these times of technology innovation many questions arise regarding the pedagogical principles underpinning the development of consistent, reliable programs with positive effects in students' performance and achievement. Dissemination and exchange of present experiences and practices is a fruitful way to engage in discussion and knowledge building about e-learning, its potentialities and limitations.

In this paper we describe and discuss the implications on students' participation of implementing a problem-based learning (PBL) approach in an online course supported by Moodle.

Students' participation is a major requirement for the generation of collaborative, interactive and flexible online learning environments as described in the literature (Harasim, 2002). However, in practice, it is a difficult endeavour since, as many sources comment, a considerable number of students tend to dropout or to remain "silent" in online courses. We assume that adequate pedagogical approaches associated to the technologies in use are needed in order to reach a positive attendance by all students in different e-learning situations.

Course Development: A Retrospective

The course on school health promotion has been offered for three years as an optional discipline in the context of a traditional in-presence university graduate program. Students enrolled have been mostly K-12 teachers of a variety of subjects.

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Blended learning was the modality chosen with three sessions in presence: in the beginning of the semester, after the first module, and in the end for the presentation of students' work.

ODL QC standards³ were used in order to ensure the quality of the course. Interaction, collaboration, flexibility, in-context learning (Figueiredo & Afonso, 2006), and ICT-enhanced environments (Linn, Davis & Bell, 2004) were the former pedagogical guidelines for students' discovery, discussion, creation, invention, analysis and critical thinking. Discussion fora, among the resources available in the platform were used with the purpose to facilitate both constructive and social learning, enabling higher order thinking skills (Jonassen, 2000).

The course first implementation (table I) was supported by a LMS platform – virtual classroom – produced and managed by a partner higher education institution (Trindade & Marques, 2004).

Table I

Main events involved in the course planning and development

Year	Events
1997/1999	Project H&S ODL – Education in European Teacher Training, Socrates Program
2003/2004	Proposal submitted to the Education Research Centre
2004/2005	First version of the course (24 students)
2005/2006	Second version with Moodle (19 students). Learning strategy: PBL
2006/2007	(18 students) Reinforcement of student collaborative work: PBL tutorial groups, teacher multiple roles.

In general students showed a positive attitude toward both the platform and the activities and produced relevant projects on school health promotion. Some of them applied these projects in their schools. However, poor participation in the discussion fora was observed. Only a few students posted entries on a regular basis, many of them were present but remained “silent” in general, and a small number never participated.

PBL as a Strategy to Promote Students' Participation

In order to overcome the situation PBL was applied for the first time in the second year in order to encourage all students to participate positively with effective interventions in the activities, namely in the discussion fora.

³ <http://dspace.dial.pipex.com/odlqc/standard.htm>

PBL is a learning method that stimulates critical thinking skills and creativity through the use of knowledge in new situations; facilitates knowledge transfer, and favours reflection and discussion among peers enhancing collaborative work (Rendas, Pinto e Gamboa, 1997). This student centred method has been increasingly used in higher education and has been proposed in the design of online programs (Jonassen, Howland, Moore, & Marra, 2003).

In the second version of the course different problem situations related to the students' professional experience were designed enabling a meaningful context for questioning and knowledge sharing. It was presented a problem centred on health promotion conditions in the schools where students were teaching. Students replicated this problem in new questions intended to investigate the school environment. At this point students searched, discussed, and solved their difficulties with the theme and their own personal point of view. In fact they learned with their own experience and reflection using a variety of resources. It was observed a widespread participation, and positive attitudes toward the activities. However, few interactions were recorded among students. Their interventions consisted mainly in relatively long texts discouraging any comment while others contained questions that remained unanswered.

In the third year, following PBL collaborative procedures, tutorial groups were created in the platform with the purpose to promote higher levels of participation and interaction among students. Within each tutorial group formed by 6 students and the tutor more focused discussions were possible leading to a deeper understanding of the problem, the definition and distribution of tasks among the members in each group, and students' initiative. An attempt was made in order to follow the seven-jump model described by van der Vleuten (2000) as a structure for leading the discussions in each tutorial group. This context-rich situation was very useful for the tutor who was able to identify with precision students' needs and adequate ways of guidance.

Interaction in discussion fora became the path to give instructions and encourage enquiry. As time passed by interactions between tutor and students became differentiated. Tutors in this scenario performed different role-plays: to conduct synchronous and asynchronous discussions (tutor), to manage technological resources (administrator), to make the bridge between students and the problems, materials, resources, and tasks (mediator), to assess students' performance in tasks, and activities (evaluator), and finally to facilitate technological and bureaucratic issues (facilitator).

Students' participation and interaction improved gradually throughout the third version of the course. Showing an increasing autonomy they developed high quality projects that they presented to the health teachers community in a conference they organized with the tutors support⁴. Students have perceived the availability of this online course in a traditional curriculum as a positive issue since it increases flexibility and the number of possibilities for them to organize their studying program. The institution perceived it as an interesting innovation that is well integrated in the program, positively evaluated by the students, and that has the potential to become a vehicle for new methods and change in more traditional subjects.

Course Development: A Prospective

Pathways for a research plan were identified throughout this three yearlong experience that need clarification in the future: i) to reinforce PBL methodology through the creation of new problems, and to support students' transfer of PBL methodology; ii) to improve focused discussions in tutorial groups enabling students' deeper understanding of the problem, continuous feedback, identification of students' needs and ways of guidance, and students' increasing empowerment; iii) to refine evaluation procedures with the use of different approaches, precise criteria definition, and giving voice to the students, iv) to reinforce ICT enhanced environments with continuous updating of ICT use and portfolio improvement with web 2.0 resources supporting a sense of community.

References

- Dougiamas, M., & Taylor, P. (2002). *Interpretative analysis of an Internet-based course constructed using a new courseware tool*. Proceedings of HERDSA 2002 Conference, Perth Western, Australia.
- Figueiredo, A., & Afonso, A. (2006). *Managing learning in virtual settings: The role of context*. New York: Idea-group.
- Harasim, L. (2002). What makes online learning communities successful? In C. Vrasidas & G. V. Glass (Eds.), *Distance education and distributed learning* (pp. 181-200). Greenwich, Connecticut: Information Age Publishing.
- Jonassen, D.H., Howland, J., Moore, J., & Marra, R.M. (2003) *Learning to solve problems with technology: A constructivist perspective*, 2nd. Ed. Columbus, OH: Merrill/Prentice-Hall.

⁴ Available in <http://www.cientic.net/cursos07/>

- Jonassen, D. H. (2000). *Computers as mindtools for schools: Engaging critical thinking*. Columbus, OH: Prentice-Hall.
- Linn, M., Davis, E., & Bell, P. (2004). *Internet environments for science education*. Mahwah, NJ : Lawrence Erlbaum Associates.
- Rendas A., Pinto P., & Gamboa, T. (1997). Aplicação ao ensino médico do método de aprendizagem por problemas. 1ª parte: Reflexões sobre o método como uma estratégia de inovação. *Educação Médica* 8 (1): 17-35.
- Trindade, S., & Marques, J. (2004). *Sala de aula virtual*. Castelo Branco: Instituto Politécnico de Castelo Branco.
- van der Vleuten, C. (2000) Problem-based learning: the case of Maastricht. Communication presented at the conference *Teaching and Learning in the New Millenium*. Hong-Kong.