A blended learning experience in Pharmacology: towards new teaching strategies

Teresa Encinas, José-María Ros-Rodríguez, Juan-Antonio Gilabert. Universidad Complutense, Madrid, Spain.

Blended learning (b-learning) methods consist of structured activities combining two strategies such as traditional teaching with computer-mediated instruction. During the 2008-2009 academic course, a new teaching strategy has been developed using a b-learning approach in the teaching of Pharmacology to our 3rd year students. It combines traditional lectures, seminars and tutorials with the support of an online course according to a modular structure (Keller, 1968; Lockman et al, 2008), simultaneously to the traditional lectures and allowing a progressive and self-driven learning by the students.

The present work describes the structure, methodology, content and preliminary evaluation of a pilot b-learning group of Pharmacology in the Faculty of Veterinary Medicine (Universidad Complutense de Madrid, Spain) formed by 6 volunteer students and 3 teachers-tutors.

An interactive web-based '*Virtual Classroom of Pharmacology*' was constructed using WebCT (Blackboard Inc., USA) with restricted access to the participants in the b-learning education. Each module corresponds with one section of the syllabus containing several types of pedagogical resources (multimedia files, links to WWW, quizzes, games, etc). A module of general reference resources was also included. Modules also contained different tools to improve communication between students and teachers. The students and teachers' opinion was obtained from scored questionnaires and the academic results from the b-learning group were compared to the rest of students. Results are expressed as mean ± SEM.

The qualitative and quantitative results derived from questionnaires, academic qualifications and personal comments showed that, in general terms, this was a very well-accepted change in the methodology of teaching. Thus, virtual *vs.* face-to-face synchronization, the level of use of materials and the students and teachers' evaluations were positive. However, the small number of participants and the short life until now of this experience limited the statistical comparison of the results, although the academic outcomes tend to be better in the b-learning group (mark=5.59±0,35 and pass=83.3%; n=6) vs. face-to-face group mark=4.76±0,01 and pass=52.3%; n=173). '*Virtual classroom*' was a tool positively accepted and its contents were considered of interest, adequate and very useful to understand different aspects of Pharmacology. Communications tools in the website, as a student's forum, had a very positive reception promoting discussion and to resolve doubts along the course. Although the small number of b-learning students does not permit to reach conclusive results in quantitative terms, students highlighted the usefulness of this method, which encouraged them to study regularly permitting the access to different kinds of educational material and to discuss difficult items due to a closer student-professor relationship. However, some limitations are the applicability to bigger groups and a more demanding method in terms of economical and personal resources.

These outcomes suggest the usefulness of b-learning-based instruction in the transition to new teaching strategies due to implementation of the European Higher Education Area with a more relevant role as guide/tutor of the teachers.

1. Keller FS (1968). Goodbye, teacher. J Appl Behav Analysis 1:79–89.
2. Lockman PR et al. (2008) Using WebCT to implement a basic science competence education course. Am. J. Pharm. Educ. 72: 39.