Chapter 14

Educational Applications of Clickers in University Teaching

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ABSTRACT

The purpose of this chapter is to contextualize the situation of the use of remote response devices or clickers in education and identify the benefits that tools such as Q-Click software can bring to university teaching and to different groups of students. To fulfill this objective, the authors conducted research in classes with students who rated 149 different aspects related to the use of such software, including its use in class, benefits, and implications for follow-up assessment of the subject, attention, and class quality. This information was then compared to other groups of students studying the same subject who did not use clickers in class. The findings confirm the original proposal verifying the usefulness of these tools in university teaching for the important consequences for students and teachers.

INTRODUCTION

The real interest of young people in Information Technology and Communication (ICT) is a phenomenon that has been widely studied in scientific literature because of its implications and social consequences. It is common knowledge that today’s youth have the highest rates of use of computers, Internet access, email, and mobile phones, among other technologies (National Institute of Statistics, INE, 2011). A college education should therefore use these tools to improve processes and outcomes of student learning (Wan et al., 2007) to meet the targets set in the European Higher Education Area (EHEA).

The analysis of the implementation of ICT in teaching began several decades ago as its advantages, which reinforced the educational level of students, were recognized. Ferro et al. (2009) summarizes the main advantages of using ICT in university teaching. ICTs:
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1. Break space-time barriers in teaching and learning activities.
2. Create open and flexible learning processes.
3. Improve communication between the various players in the teaching and learning process.
4. Personalize education.
5. Provide quick access to information.
6. Facilitate interaction with information.
7. Raise the interest level and motivation of students.
8. Improve educational effectiveness.
9. Allow the teacher more time for other tasks.
10. Support follow-up learning.

To date there have been many innovations that have been implemented in teaching: (i) multimedia tools (Alférez et al., 2010), (ii) whiteboards (Murillo, 2010), (iii) web sites (Gates, 2011), (iv) wikis (Ortiz de Urbina and Mora, 2011), (v) forums (Benitez et al., 2011), (vi) Mobile Learning (Liaw et al., 2009), (vii) second life (Checa, 2010) and even (viii) microblogging networks (Liébana-Cabanillas et al., 2011).

The use of remote response devices, electronic voting systems, systems and audience response clickers, began in the sixties (Chafer, 2009), although it was not until the nineties when their use began to flourish. Although these devices were originally used for management meetings, opinion surveys, and conventions, etc. (Ruiz-Jimenez et al., 2010), such tools are widely used in some American universities (Harvard, Massachusetts-Amherst, Colorado, etc.). Recently, these devices are also being used in Spanish universities (Navarra, Barcelona, Granada, Seville, Madrid, etc.) since remote response devices reinforce the quality of education, and improve student performance and the productivity of teachers.

These are devices that allow students to obtain information found in the classroom in an agile, fast and simple via a transmitter (clicker) and receiver system connected by infrared or Bluetooth, to communicate and record responses that students make.

The information obtained in the interaction is processed immediately, allowing instant feedback between teacher and student, which demonstrates class understanding and knowledge on a regular basis, as well as potential problems that students may have with the subject.

This chapter is structured in three main sections. It begins by analyzing the current state of electronic voting systems or clickers as a technology that complements professor lectures in the classroom. After this general introduction, the operation and implications of these tools in university teaching is described. Finally, the benefits to students and teachers that are gained from integrating these technologies in education systems are analyzed. Specifically, the case of Q-Click software implemented in different courses of the Faculty of Economics and Business, University of Granada, is discussed.

PRESENT STATUS OF ELECTRONIC VOTING SYSTEMS

Today, the challenges and commitments proposed by the European Higher Education Area (EHEA) are in the process of transforming our educational system based on “teaching” into one based on “learning.” This improvement process should be interactive and collaborative and is based on three basic principles (University Coordination Council, MEC, 2005): 1) greater involvement and student autonomy, 2) use of active methodologies, case studies, teamwork, mentoring seminars, and multimedia technologies and 3) a review of the role of teachers as creative agents in learning environments that encourage students.

These principles raise the need for new ICT applications in the field of university education. An audience response system is a useful tool to help comply with these proposed principles.

Electronic voting systems or clickers are small transmitters that transmit coded responses to questions posed by the teacher, allowing students