

Reaching learning objectives of the cognitive domain with a synchronized streaming media environment

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The increasing use of streaming technologies for learning purposes and the potential impact it seems to have in the learning process flexibility, motivated the study of which learning objectives of the cognitive domain can be directly addressed by this technology, and which ones require additional activities.

This paper presents a set of experiences related with this subject, developed at the School of Engineering of the Minho University, Portugal, with undergraduate and postgraduate degree programmes. The experiences consisted on total replacement of a lecture about a given subject, traditionally presented at a classroom using an expository instructional approach, by synchronized streaming media content, preceded and followed by evaluation questionnaires.

In this context, by synchronized streaming media (SSM) content we mean a few media elements integrated and synchronized, producing a pedagogically oriented resource, available to students through an ordinary browser over the Internet. The SSM presentation environment, used within this project, integrates elements such as video, slides, HTML and a table of contents, allowing interactivity actions typically found in this type of resource (e.g. reverse, forward, pause, next and previous chapter).

The target of the experiences was a group of students (undergraduate and postgraduate courses), which have access to technical equipment and conditions to intervening in the process (Internet connection and bandwidth). The objective was not to find the conditions and technical considerations where this technology can or cannot be used, but when it is used in the appropriate context, which learning objectives can be met and to define a set of recommendations that can help teachers to develop simple, but effective and value added, synchronized streaming media content.

The approach and recommendations for SSM content's development are based on low cost technologies, most of them already present on teacher's computers, which enable them to create their own learning contents, without the need of professional equipment or advanced technical skills.

The comparison of the preliminary evaluation results obtained from this experience, with the results obtained in previous years, allowed us to anticipate that only the first two categories in the cognitive domain (knowledge and comprehension), defined by the Bloom's taxonomy, are completely achieved by the synchronized streaming media content. The third category (Application) is only partially reached and the other three (Analysis, Synthesis and Evaluation) require the implementation of additional activities (e.g. discussion forums, guided analysis and research, hands-on activities, group techniques). We plan to enlarge the experience to different subjects and student groups, in order to confirm these results. Besides, a set of typical learning objectives was derived from these previous experiences, which will guide teachers to design SSM contents for those subjects/competencies achievable by this mean.

Keywords: streaming, learning objectives, synchronized streaming media