

A Different Perspective on Lecture Video-Streaming: How to Use Technology to Help Change the Traditional Lecture Model

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ABSTRACT

In this paper, the author proposes a paradigm shift in the way video lectures are used in education. Instead of using them to support traditional teaching methods, the author suggests replacing standard lectures with video lectures, opening a space for a more participatory and interactive form of teaching that supports students in deeper understanding. In this paper, the author reviews the literature, discusses the effectiveness of video lectures, and describes a methodology called VOLARE ("Video On Line As Replacement of old Teaching practices").

Keywords: *Educational Technology, Online Learning, Participatory Teaching, Teaching Methodologies, Video Lectures*

1 INTRODUCTION

When the incandescent light bulbs were first introduced, they simply replaced combustion-based lighting systems. Combustion-based lamps however had their own requirements: they could not be placed close to the ceiling because it would have been dangerous. Moreover they had to be easy to reach for maintenance (e.g. for refilling). Hence they were typically placed at mid height on the walls of the rooms: a position that is far from optimal for their main purpose (i.e. lighting the room), but that was dictated by a compromise among contrasting needs. It took years until people realized that a better

place was on the ceiling, in the middle of the room. Although the constraints were not there anymore, they had remained in people's head. The same pattern can be found over and over with almost all the technologies: it takes time until we are able to exploit their full potential, because we remain prisoners of the so-called "paradigm paralysis", i.e. the inability to see beyond the current models of thinking.

The claim we make in the present paper is that there is the opportunity to shift our current teaching paradigm by exploiting video lectures in a quite innovative way. Most people agree that teaching needs a paradigm shift: the traditional learning model based on frontal lectures held in class has been highly criticized because of the passive role played by the students.

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Constructionist (see Ally, 2008, for a general discussion of learning theories), and more recently, connectivist (Siemens, 2005) approaches have been suggested as possible alternatives. It is however not so easy to start a transition toward these innovative and presumably more effective teaching styles. Many hurdles make the switch difficult. For instance it is not easy to apply the new paradigms to large audiences: it is generally necessary to split the class in smaller groups guided by tutors (either in presence or on-line), which means that the delivery of a course becomes significantly more expensive.

Temporal limitations also create hurdles that make it difficult to abandon the *status-quo*: teachers often need almost all of the lecture slots to deliver the content. The belief that a constructivist approach is more time-consuming may be wrong but it is widespread. This factor is another significant obstacle to a methodological transition. Time is in fact a precious resource.

Also, many teachers think that students need to have some background knowledge and a basic understanding of the problem domain before they can effectively engage in problem-solving or collaborative learning. Classical on-line course in fact follow a standard pattern: first they deliver knowledge, and then they proceed to sections where the students are supposed to be more active (e.g. by doing exercises that should assess their degree of understanding). Many blended approaches can also be mapped to the same pattern: first knowledge is delivered (typically on line) and then collaborative or constructive approaches are taken in non-virtual sessions.

In the present paper we suggest a methodology that should make it easier for teachers that presently use a traditional, frontal approach to migrate to a (at least) more interactive teaching style. Information and Communication Technology (ICT) plays, in our approach, a fundamental role in allowing such a change. We focus on academic teaching rather than on the processes that take place in other forms of education (such as primary and secondary schools, and adult learning) although the same principles could probably and at least partly be

adapted for these cases, with different implementations. The methodology we propose has been successfully experimented by the author with success on a small scale, and a larger scale experiment is presently in progress. The idea is to rethink the use of video lectures so as to create a new didactic space in class. In the rest of this paper we shall first recall the origin and evolution of video lectures and discuss their pedagogical effectiveness. Then we shall introduce our methodology, present the results and the related work before concluding.

2 VIDEO LECTURES

2.1 Historical Perspective

The use of videos for teaching dates back to the VCR days, when it became easy and cheap to record home videos and copy them on cassettes. The possibility of using digital video for distance education was envisioned already in the early Web days, when F. Tobagi (1995) built at Stanford a prototypical architecture for distributing digital video lectures. The digital approach was obviously superior to its analogue precursor in terms of ease of distribution of the didactic material, asynchronous and multiple simultaneous accesses. Moreover it was promising in terms of possibility of interlinking the learning resources.

Actual deployment of video-streaming in teaching followed shortly, when Hayes et al. (1998) substituted a VHS based system for delivering lectures to a geographically remote place (from USA to France) with a digital alternative. Initially they only transmitted an audio stream with synchronized power point images, but soon thereafter the video was transmitted. The video, produced with a technique called chroma key¹, included both the teacher and the slides.

In the same years the German Teleteaching project, originally envisioned in 1995, started delivering results, as reported by Hilt and Kuhmünch (1999). The project focused mostly on synchronous events, but some attention was given also to the asynchronous scenario. Three cases were considered: the “Remote

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