Chapter 9

Which Perspectives Can Drive the Analysis of Technology–Enhanced Learning Environments?

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ABSTRACT

Due to its interdisciplinary nature, educational technology research is characterized by approaches, models, and methodologies that derive from a number of different research traditions, disciplines, and approaches. Thus, the numerous research studies in this sector are characterized by a wide range of paradigms and methodologies that needs some overarching notion to be framed and understood. In this chapter, specific reference has been made to the notion of perspective. On the basis of this notion, a framework has been sketched to help make explicit the interplay between perspectives and elements that characterize technology-based learning environments. Such framework has been exemplified considering two research projects carried out at the Institute of Educational Technology of the Italian National Research Council.

INTRODUCTION

Educational Technology (or Technology Enhanced Learning – TEL – as it is often named in Europe) is a non-traditional and relatively new research field that was born in the past century around the mid-sixties. Even if it was at times regarded as belonging either to pedagogy, information and communication technologies, cognitive science or to the specific disciplin-ary fields where new learning technologies are applied, in recent decades it has progressively established itself at the international level as an autonomous interdisciplinary research sector with its own journals, university centres and proper funding programmes (i.e. European Commission Framework Programmes, the Advanced Learning Technologies program of the USA National Science Foundation, etc.). An important role for the consolidation of this research field in Europe

has had funding from the European Commission of networks of research organizations, the so-called Networks of Excellence. At European level, educational technology is considered as one of the key priorities for ICT research and innovation as evidenced by the results of a wide open consultation promoted by the European Commission (European Commission, 2009). Moreover, one of the seven flagship initiatives of Europe 2020, "*Youth on the move*," has as one of its objectives the improvement of the quality and the performance of educational systems and the strengthening of the synergy between formal and informal learning.

Generally speaking, the objective of educational technology research is to study the role that information and communications technologies (ICTs) have in teaching and learning processes. These processes are considered not only at the institutional level (school, university) or for professional training but also in a lifelong perspective as pointed out, for example, by the European Union in the Digital Agenda for Europe (European Commission, 2010), one of the seven pillars of the so-called Europe 2020 Strategy.

Educational Technology research is strongly interdisciplinary and it is characterized by a close interdependence between basic and applied research. It integrates theoretical analyses, development of prototypes and methodologies and in-field studies. As a matter of fact, conceptual elaboration is often intertwined with the development of systems and software tools as well as their testing in real contexts (e.g. school, universities, vocational training). The in-field experiments, involving educational processes, usually have a medium/long term extension, require models for the processing of the data and results and often have a transfer component.

Over the years, research has pointed out that an effective impact of educational technology research on education could be obtained if and only if technological innovation is developed together with pedagogical innovation (Guzman & Nussbaum, 2009). As a matter of fact, the use of new tools results in little pedagogical gain if novel educational strategies and the activities in which teachers and students are involved in are not carefully re-considered and planned. However, pedagogical innovation should be based on the opportunities offered by technological advances and on a critical examination of how such advances change substantially, in direct or indirect ways, the needs, the modalities and the content itself of teaching and learning activities.

Due to its interdisciplinary nature, educational technology research is characterized by approaches, models and methodologies that derive from a number of different research traditions, disciplines and perspectives, even if breakthroughs results are more likely to occur when people come together across the different people-centred and technical-centred disciplines. However, interdisciplinary research in TEL is difficult for a number of well-documented reasons (Conole et al., 2006). For example, the different meaning that the same term can have in different disciplines or the wide range of paradigms, concepts, theories, methodologies and methods that different disciplines use and apply. A strategy for addressing such difficulties is to be aware of the different perspectives that can be assumed in TEL (Bottino, 2013) and to regard multiple and complex perspectives as essential for innovation since it is out of tensions between different disciplinary perspectives that innovative approaches to problems may arise (Sutherland et al., 2012).

Driving from such strategy, this paper sketches a framework based on perspectives to support the understanding of research studies in the field of educational technology.

Such framework provides a reference to analyse learning environments integrating technology according to their main distinctive features and to connect questions related to educational technology research to issues proper to related disciplines. The idea is not to provide an overall categorization of perspectives in educational tech-

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