AN OVERVIEW OF THE NEW DEVELOPMENTS IN E-LEARNING. THE DIGITAL INSTRUMENTATION OF LEARNING

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***Abstract**: eLearning* (or its variants, e.g., e-Learning, E-Learning, etc.) is no longer a new term, although it remains an innovative concept. Since its inception in the 1960s and '70s, with electronic learning content delivery systems such as the University of Illinois's Plato (Woolley, 1994), eLearning has come a very long way.

Key words: *eLearning, computer-supported collaborative learning, eLearning programmes*

Introduction

eLearning (or its variants, e.g., e-Learning, E-Learning, etc.) is no longer a new term, although it remains an innovative concept. Since its inception in the 1960s and '70s, with electronic learning content delivery systems such as the University of Illinois's Plato (Woolley, 1994), eLearning has come a very long way. The main characteristic of eLearning is that it allows the development and implementation of new ways of both teaching and learning, underpinned by subjacent methods of thinking and content structuring (Aşkar & Halıcı, 2004). Analogous to the terminology coined in reference to the new era of digital technology, eLearning is also said to be nowadays in its 2.0 phase (Karrer, 2007). The first days of eLearning in education were tributary to the classical, face-to-face model of learning, in which the emphasis was on the unidirectional transfer of knowledge, with the system as a repository of information and the student as the beneficiary.

Developments in eLearning

Reasons for eLearning. Tributary to the rapid development of educational ICT (Bates, 2001; Daniel, 2012), the curricular approach requires a systematic and consistent integration by the educational establishments and by the education professionals, as far as the instructional design is

concerned (Voogt, 2012). The main benefits of this incorporation are the widened access to learning, enhanced and optimized opportunities for learning and teaching, as well as financial gains (Chaney et al., 2007). But the benefits are not restricted to the educational establishments and institution and their nature is not only societal and socioeconomic. The student is also favored by the use of ICT due to the shared construction of knowledge and the increased control over the learning processes (Leidner & Jarvenpaa, 1995). The possibility of utilizing non-linear and asynchronous audio-video and searchable learning content favors the learning efficiency (Vural, 2013).

The advent of computer-supported collaborative learning. Whereas in the first days of eLearning the study programmes were concerned with the content delivery, this approach shifted rather significantly with the later advent of computer-supported collaborative learning, which emphasis the social learning and, more specifically, the shared development of knowledge (Stahl, Koschmann, & Suthers, 2006). The fundamental research show a positive impact of computer-supported collaborative learning on increasing the performance and academic motivation, optimization of peer-to-peer and student-to-teacher relations, and in reducing the negative effect of learning difficulties and challenges (Xiao, 2012). However, several important characteristics have to be considered for the effectiveness of eLearning, that is, the role of the education experts in developing the programmes content (Malik & Rahman, 2010), the learning community and the assessment components (Shamatha, Peressini, & Meymaris, 2004)

Recent avenues of research. Research showed that computer-supported collaborative learning (CSCL), either explicitly involving collaboration scripts (Kollar, Fischer, & Slotta, 2007; Stegmann, Weinberger, & Fischer, 2007) or not (Van Gelder, 2001), have significant and sometimes tremendous impact on learning outcomes in general, and the development of reasoning and argumentation skills, in particular. However, not all educational establishments can feasibly develop dedicated CSCL learning/study programmes and not all students have access to specifically designed digital environments and/or tools. Moreover, sometimes, the collaboration is confined to a specific group of students pursuing a certain course.

Students' academic production and proficiency. One area of applicability in education concerns the production of students' academic materials. Academic research papers and argumentative essays during university years are established and commonly encountered academic tasks, representative for the students' understanding of taught theories and learning, including the students' abilities to reason and argument scientifically. The collaborative production of academic papers supported by epistemic scripts (Weinberger, 2003; Weinberger, Ertl, Fischer, & Mandl,

2005), if adapted and scaffolded, is expected to be beneficial for the development of domain-specific SRA abilities. Possible correlates (educational technology acceptance, cognitive distortions, rationality etc.) that may explain effect variations (potential moderators of the influence), and research contrasting non-interventional, comparison group/s, with the experimental group/s, assisted in using the proposed digital instrumentation for purposes of creating academic critical and argumentative papers must also be considered.

Conceptualizing critical thinking is a crucial stage of today's research, in which measurements are to be designed (identified, adapted, or constructed) in order to test the interventions' effects. This is a requirement which stems mainly from the disputed understanding of criticality. The consensual understanding is still to be found, since its utilization is influenced by the users' ideologies (Brookfield, 2000) and there are multiple, sometimes overlapping, definitions of critical thinking (Scriven & Paul, 1987). Also, the measurements have to consider three key characteristic strategies that ensure efficiency in the scientists' thinking: focusing on unexpected findings, analogic reasoning, and distributed reasoning (Dunbar, 2000).

Strategic high-end education and research programmes focused on eLearning. However, not only researchers in pedagogy and educational psychology keep a keen interest in the effects of ICT in education, but also institutions and educational establishments are nowadays pursuing strategic and applied policies which incorporate actively the ICT. For instance, The Ludwig-Maximilians University of München's *REASON* programme (München Center of Learning Sciences, 2013) declares both research and structural goals. Whereas the research interest refer to the analysis and facilitation of scientific reasoning and argumentation in their students, the structural goals refer to the identification and/or creation of innovative elements in the doctoral research with a view towards expanding the educational curriculum and those elements of the research directly applicable in education. A very similar programme, the *Reason! Programme*, was conducted by Tim Van Gelder in collaboration with the University of Melbourne roughly between 1998 and 2004, albeit, at least as the project's results are concerned, it aimed more at the development of 'reasoning' supportive software than at integrating them in a specific curricular strategy (Van Gelder, 2001, 2013).

Discussions

The above overview makes apparent that *eLearning*, as a field of action and research, has reached a level of maturation which requires adequate attention. Not only eLearning, as an action and research field of education evolved significantly, both quantitatively and qualitatively, but it bears the

signs of an implacable, albeit rather insidious, revolution in education. Its insidiousness is not the trademark of acting in a hidden manner but it comes mainly from the pervasive nature of the ICT immersing in our daily lives, and specifically, in education. Further conceptual clarification is needed, as well as an increase in fundamental research aimed at the exploration of the effects and impact of technology on learning and the development of strong and coherent underpinning theories. Today, we must acknowledge that there are new developments regarding what we use to call eLearning, which go beyond the computer assisted/supported learning. These developments reached into a veritable digitization of learning, and modified substantially the very nature of learning environments (means and methods) and of learning tools (knowledge construction, sharing and representation software).

The applications for the fundamental research are immediate and straightforward. For instance, the utilization of widely and freely available open-source software for enhancing the individual's knowledge acquisition and metacognition can be considered as a viable alternative to developing in-house software. As such, it can be argued that the benefits of using computer-supported collaborative script-based learning can be replicated using a combination of open-source and free concept and argument mapping software, such as CMAP (Novak & Cañas, 2004, 2006a, 2006b) and Argunet editor(Betz, Cacean, & Voigt, 2013). From a pragmatic perspective, considering the applicability in the educational process, if properly scripted, the utilization of the above mentioned open-source would expectedly impact on the individual knowledge acquisition and metacognition (Kollar, Fischer, & Hesse, 2006). This particular avenue of research would further contribute to the practical applications of the script theory (Fischer, Kollar, Stegmann, & Wecker, 2013) in the development of scientific reasoning and argumentation (SRA) abilities. Whereas it not unique, there is, however, not only a perceivable lack of visibility of Romanian fundamental research in this field but also a lack of perceivable interest, action-research and dedicated activities at the grass-roots level of the educational establishments.

A series of questions also emerge from our previous short analysis. The most relevant are: What does the educational establishment do or intends to do in order to capitalize from the new developments regarding the digital instrumentation of learning? Is the Romanian educational establishment ready, as far as the education professionals and the educational institutions are concerned, for competing effectively with other educational systems worldwide? More specifically, does the educational system explicitly consider and prepares to act accordingly with a view toward the collaboration and interdisciplinarity needed for benefiting from these new developments? Also, since the role of experts in the development

of efficient eLearning programmes is crucial (Malik & Rahman, 2010), does the Romanian educational establishment consider favoring an open and direct approach towards the teachers involvement in the development of those educational policies and programmes who put eLearning at their core? Does the Romanian educational establishment consider developing a coherent, consistent and productive interest in using the opportunities created by the above analyzed new developments?

Collaborative private-and-state initiatives or simply nongovernmental initiatives, such as eLearning Romania (Institutul pentru Educație, 2013), Siveco's AEL (Siveco Romania, 2013), the Ministry of Education's Institute for Education Sciences eLearning Forum (Educației, 2013), and even the European Commission's *Open Education Europa* programme (European Commission, 2013) appear to be ready to provide expertise and support for a proper and strategic development of eLearning in Romania. This leaves us, at least for the time being, with premises and promises for a favorable future. Finally, the most important conclusion that we have derived from our short overview is that eLearning can be regarded today no longer just as an innovative combination of tools and environments aimed at sustain learning and teaching but also as a veritable digital instrumentation of learning.

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