

Chapter 7

Critical Thinking and Digital Technologies: An Outcome Evaluation

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ABSTRACT

The aim of this study is to identify the new trends on technology use in developing critical thinking skills. By this purpose, the researches published between 2008-2014 in Science Direct database were examined by using content analysis. Also study was completed in three main parts. The first part consists of the conceptual framework about, technology use in education, critical thinking, the effect of technology on critical thinking and new technologies used to develop critical thinking skills. In the second part the content analysis method was used to examine the researches published in Science Direct database. In the final part, the conclusion and recommendations were given about the research and future studies.

INTRODUCTION¹

Today, critical thinking has an important place in the educational process. Analysis, self-regulation, making comments, identifying assumptions, giving explanations, and using evaluation are the main constituents of critical thinking. In the 21st century, technology has assumed a significant role in the critical thinking skills of students and teachers. A sharp increase has been observed in the use of IT, which enhances critical thinking and changes how it is used. Within the curriculum, critical thinking has been stated to include several sub-skills such as finding cause-and-effect relationships, getting similari-

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ties and differences in details by using various criteria, assessing the acceptability and validity of the information provided, analyzing, evaluating, interpreting and making inference (MEB, 2005).

Technology changes how we think, gather and produce information. In particular, the Internet changes our life and ways of thinking. In a comparable study on the basic understanding of materials given to a class with and without Internet access, students were given access to the Internet within the class and encouraged to use the same in their studies to understand the material better compared to the students without Internet access. However, this research also shows that students who accessed the Internet during classes failed to process what the lecturer said. Test scores on the lecture showed that students without internet access performed better than students with internet access (Wolpert, 2009). The inclusion of real-time media like TVs and video games thus reduces the time that is allocated for critical thinking and contemplation (Wolpert, 2009). Yet sites such as Nings, wikis, blogs and discussion boards facilitate thinking and help students' present new ideas and contribute to discussions during the learning process (Thompson & Crompton, 2010).

As described by Glaser (1942, p.6) and by Fisher (2001), critical thinking is generally seen as the need to be able to recognize problems, to find workable means for solving those problems, to gather and marshal pertinent information, to recognize unstated assumptions and values, to comprehend and use language with accuracy, clarity, and discrimination, to interpret data, to appraise evidence and evaluate arguments, to recognize the existence (or non-existence) of logical relationships between propositions, to draw accurate conclusions and generalizations, to test these conclusions and the generalizations at which one arrives, to reconstruct one's patterns of beliefs on the basis of wider experience, and to render accurate judgments about specific things and qualities in everyday life.

In this study, following a presentation of a general framework for and about the use of technology in education, some aspects of critical thinking and its relationship to technology are addressed. Online discussion, web 2.0 tools, virtual learning environments, social networks, simulations, robotics and digital stories which provide an opportunity for learning, and most of which can be defined as new technologies, are explained. Moreover, a sub-framework including an assessment about the place of these technologies in critical thinking is presented. The main objective of this study is to assess the content, methodology and general outlook of studies into the relationship between critical thinking and technology that were published within a frequently used database between 2008 and 2014.

BACKGROUND

Technology Use in Education

The word 'technology' is a combination of the Ancient Greek words, "tekhne", meaning ability, and "logos", meaning science (Murphie & Potts, 2003). In defining technology, various opinions have been advanced. The current meanings of technology emerged in the modern age and started to be used in the second half of the 19th century. Kline (1985) defines technology as a term representing objects, actions, processes, methods and systems while the International Technology Education Association (ITEA) (2007) defines it as changing, renovating and transforming the natural environment to meet perceived human needs and requests. Demirel (2003) defines technology as using definite information in compliance with specific purposes. In general, technology is defined as a discipline formed with a combination of various items for a specific purpose in a particular pattern and functioning as a bridge

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