

Chapter 8

Teaching History of Mathematics through Digital Stories: A Technology Integration Model

Lutfi Incikabi
Kastamonu University, Turkey

ABSTRACT

This chapter introduces a way for enhancing teaching history of mathematics through digital storytelling. Adapting digital stories in the form of historical documentaries, this chapter also provides components of digital storytelling (point of view, dramatic question, emotional content, the gift of your voice, the power of the soundtrack, economy, pacing, purpose of story, choice of content, quality of images, grammar and language usage) and necessary steps (tellable story, composing script, choosing visual and audio components, preparing digital stories, presenting digital stories) that are to be taken into consideration while preparing digital stories.

INTRODUCTION

Nowadays, technology has surrounded our lives such a way that we become overly dependent on it because of its priceless benefits. This close relationship between (modern) technology and humanity also affected the way of learning and teaching. In turn, the term “technology enhanced learning” becomes evident in recent literature in education. Technology enhanced learning covers all those circumstances where technology plays a significant role in making learning more effec-

tive, efficient or enjoyable (Goodyear, & Retalis, 2010). Moreover, literature provides several models of technology integration of educational environments that include accessing and studying learning material, learning through inquiry, learning through construction, learning through communication and collaboration, assessing learning, and developing digital and multimedia literacy (Bruce, & Levin 1997; Chickering, & Ehrmann, 1996; Conole, Dyke, Oliver, & Seale, 2004; Jonassen, 2008).

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Instructional Technology: Advantageous or Not?

In educational settings, learning and technology interacts in two ways: Learning from technology, and learning with technology. The former adopts technologies as teachers by using them to teach concepts to students in the same ways that teachers had always taught. Learning from technology process requires two steps. The first step is embedding the information in the technology, and technology, in the next step, transmits that information to the learners. Learning with technology, on the other hand, necessitates uses of technologies for engaging and facilitating thinking that produces learning. Successful integration of technology urges efficient adaptation of learning theories and content-specific approaches to curriculum development. In order to robust students' learning with technology, teachers are required to guide their students to construct their knowledge. Teachers' guidance for knowledge construction will also help students for learning with understanding (meaningful learning) that requires interacting in a way that allows discussion, communication, collaboration, and reflection (Jonassen, Howland, Moore, & Marra, 2003).

Sociological framework of technology introduces the terms of "educational technology" and "instructional technology." Most of the time, we face similar definitions for these terms that states "both share a common interest in the processes of human learning and teaching, with some variations in definitions and levels of complexity, depending upon one's personal viewpoint" (Earle, 2002, p. 6). The term of educational technology, regarded as a fundamental factor for improving students' achievement, generally refers to the introduction of computers and related pieces of equipment to the classroom (Wenglinsky, 2005). Different definitions of the instructional technologies are evident in literature. By relating instructional technology with the strategies that adapted for impediment of the problems encountered during

teaching, Gentry (2002) defines instructional technology as "the systemic and systematic application of strategies and techniques derived from behavioral and physical sciences concepts and other knowledge to the solution of instructional problems" (p. 7). As a subdivision of educational technologies, instructional technology are usually in charge of improving the effectiveness and efficiency of learning in educational contexts, regardless of the nature or substance of that learning (Cassidy, 1982). A broader definition comes from Commission on Instructional Technology (1970), instructional technology is

...the media born of the communications revolution which can be used for instructional purposes alongside the teacher, textbook, and blackboard... [as well as]...a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communications, and employing a combination of human and nonhuman resources to bring about more effective instructions (p. 19).

Despite these more comprehensive viewpoints from the literature that instructional technology encompasses the broader processes of teaching and learning, most people nominates computer technology as a synonym for instructional technology (Earle, 2002). No one argue the impact of technology in the educational settings. Surveys (e.g. Commission on Instructional Technology, 1970), conducted at the beginning of educational technology era, indicated that computer technology, most of the time, were utilized as a tool to access information outside the classroom and improved student motivation, not as a facilitator for teaching of a specific content.

According to Wager (1992), considering educational technology as a "hardware" does not possess a huge contribution to the quality of education. Impact of technology depends on the process of designing effective instruction that

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