Chapter 24
Communication Technologies for Instructional Use:
Linear and Nonlinear Tools Contributing to Student Learning

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ABSTRACT

This chapter explores educational tools that adopt the interactive nature of communication technologies. The effectiveness of communication technologies for teaching varies depending on what and how the tools are used. Further, learner characteristics and/or available facilities determine the effect of communication technologies as instructional tools on student learning. In this chapter, the most up-to-date communication technologies for classroom use are introduced and evaluated. Linear technologies such as Screenr® and Ispring® are assessed from an educator perspective. Nonlinear communication technologies include Wimba,® Turning Technologies,® or Second Life.® Possible advantages and disadvantages are discussed as implications that instructors can reference for their own needs and objectives in teaching. This chapter concludes that instructors find the best-fit tools for their course objectives, materials, student backgrounds, and difficulty levels.

INTRODUCTION

Educators increasingly rely on communication technologies, defined as the systems used for connecting communicators through electronic multimedia devices including computers, video, audio, and phones, for pedagogical development. Seismic changes in instructional technologies with the advent of the digital age offer instructors new opportunities of effective teaching in and out of the classroom and interactions with learners. Today, harnessing the utility of communication technologies for instructional use is a top priority to edu-

DOI: 10.4018/978-1-60960-878-1.ch024

cators teaching the tech savvy social networking Net (*N*)-generation. Communication technologies from email to interactive virtual classroom enable educators to communicate with students in both a synchronous and asynchronous way expecting intended positive educational results.

Research on the effectiveness of communication technologies for instructional use report many different results encompassing positive and negative learning experiences. The outcomes of technology use also depend on the characteristics of learners and educators, facility settings, and instructional tool customization. There would need to be different pedagogical methods for students in varying age groups, cultures, and course subjects. Interfaces used for educational materials, such as video, audio, images, texts in the network environment fit learning development dependent on learners' needs and educators' instructional plans (e.g., Jones, Dean, & Hui-Chan, 2010; Wang, & Hsu, 2008).

In this chapter, the most up-to-date communication technologies for classroom use are introduced and evaluated. Possible benefits and downfalls are discussed as implications that educators can reference for their own teaching needs. Prior to the explanations of the technologies, empirical assessments about communication technologies for instructional use are explicated.

EFFECTIVENESS OF COMMUNICATION TECHNOLOGIES AS INSTRUCTIONAL TOOLS

The *N*-generation (social networking generation) today is more familiar with digital gadgets than any other generation. From first graders in elementary school to graduate students in college using Facebook,® Twitter,® iPad,® and cell phones apps for communication on a daily basis, they tend to be used to technology-oriented learning environments. In addition to the *N*-generation's fluency in communication technologies, many other factors have propelled the transformation of pedagogical methods from the traditional classroom setting to interactive learning. For example, communication technologies for interaction and instructions are commonplace in educational sectors because the use of them saves time and offers flexibility (Shea, Motiwalla, & Lewis, 2001; Sullivan, 2001). Further, digital interactivity has become a norm in communicating between educators and learners (Benbunan-Fich et al., 2001; Phillips, 1998).

Overall research on communication technologies as instructional tools suggests that the effectiveness of technologies is threefold. First, many studies tout the functionality of communication technologies used for education. A second group of research reports the opposite of the functionality, which addresses counterproductive pedagogical effectiveness as a result of communication technology use for teaching and learning. Another body of research emphasizes customized effects of technologies as they fit in specific pedagogy.

According to positive effects, communication technologies with the interactive nature enhance learner participation in class discussion, recall and understanding of class materials, teamwork skills, and overall enjoyment of class (Uektschy, 2001). Segmented categories of pedagogy are useful in applying communication technologies to teaching. Research found that subject knowledge, course management, and student management skills combined with interactive communication technologies for a course produced promising outcomes of the adoption (Madhavaram & Laverie, 2010). A computer-aided tutor system positively influenced students' level of learning and classroom functioning (Aleven, Stahl, Schworm, Fischer, & Wallace, 2003; Schofield, Eurich-Fulcer, & Britt, 1994). Use of communication technologies for class also facilitates student interest in and understanding of subjects (Miller, 2009).

On the other hand, some researchers address that communication technologies generate counterproductive results in some instructional settings. In a study of high school students' use