

Chapter 31

Application of Computer, Digital, and Telecommunications Technologies to the Clinical Preparation of Teachers

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ABSTRACT

Computer-mediated communication (CMC) is becoming common place in the preparation of teachers. This chapter will focus on the application of CMC and will provide insight on how technology can be used in P-12 classrooms and potentially impact student learning. The purpose of the chapter is to: (a) describe the development, implementation, outcomes, and sustainability of a pre-service teacher (PST) supervision model arranged around digital technology and telecommunications, providing supervision and support for PSTs engaged in a student teaching internship, and (b) to discuss how the technology utilized may later be utilized by participating PSTs in their future classrooms (specifically videoconferencing, instant messaging, video sharing, and the critical analysis and reflection of current practices). The authors created a virtual-geographical third space in the form of a Teaching Lab that was mediated with a multimedia platform and designed around the principle of Cultural-Historical Activity Theory (CHAT). The authors also provided opportunities for PSTs to interact within that space for reflection and the sharing of best practices.

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INTRODUCTION

Over the past several decades, information technologies have had an enormous impact in America's business sector; however, P-12 education has experienced only limited and isolated effects thus far, which stands in stark contrast with research on the ever-increasing interaction students today have with technology outside of the classroom (Cuban, 1986, 2001; President's Committee of Advisors on Science and Technology, 2000; Stephens & Ballast, 2010; U.S. Department of Education [U.S. DOE], 2010). It is reported that 87% of adolescents, age 12-17, engage in some kind of electronic communication through the use of personal technologies (Lenhart et. al, 2008; 2005). In contrast, inside the classroom, there is a ratio of one computer for every 4.2 students (Coley, Cradler, & Engel, 2000). While there are many reasons for this, an underlying one is that the field of education has grown without a solid foundation or clear goals as to how to best use emerging technologies, with tech proponents often ill-informed and blindly jumping on the tech bandwagon (Healy, 1999; Wachira & Keengwe, 2011). The National Education Technology Plan 2010 (NETP), states that there is a need for infrastructure and innovation in the education system and a need to lessen the technological gap (U.S. DOE, 2010).

One method of increasing and improving the use of technology in P-12 education is through the use of technology in teacher preparation programs. In fact, one of the goals of the NETP is to provide pre-service teachers (PSTs) and inservice teachers with "professional learning experiences powered by technology" (U.S. DOE, 2010, p. 16). Integrating technology into a teacher preparation program and having PSTs experience it firsthand can lead to the transfer of these technologies to PSTs' future classroom practices. This new wave of classroom teachers will be able to apply computer-mediated communication (CMC) with students at a distance, as near as down the

hallway, or greater distances, about topics which students are studying.

One challenge to teacher preparation is to reconsider the emphasis it places on externally imposed standards, curriculum and assessment, and the emphasis that should be placed on creating structures that span the theory-practice divide designing innovative learning activities that support the gradual transition of PSTs from other-regulated prospective to self-regulated beginning teachers (See Figure 1). The challenge lies in developing these structures.

Gutierrez, Rymes, and Larson (1995) propose the development of a metaphorical "dialogical space" where PSTs bring their voices together to critique their experiences, challenge the voice of the "master" teacher, and reduce the pressure to appropriate local classroom teaching practices and identities. Similarly, Jahreie and Ottesen (2010) suggest a geographical third space where PSTs make their ideas, interpretations, reflections, failures, and successes available to supportive peers and faculty, explore and solve problems, and deal with the tensions created by the interactions between the collaborating institutions. We integrated these two notions and created a virtual-geographical third space in the form of a Teaching Lab that was mediated with a multimedia platform. A structure of this kind can be centrally located on campus, it can be face-to-face meetings in participating schools, or it can be a virtual space.

Theoretical Framework

The design of our Teaching Lab was informed by Cultural-Historical Activity Theory (CHAT) developed by Vygotsky (1962, 1978) and his colleagues, Leontiev (1978, 1981) and Luria (1932, 1966, 1979). CHAT's premise is that consciousness is the product of tool-mediated cultural activity (Cole, 1998). Four key principles derived from CHAT guided the design of our Teaching Lab:

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