

Chapter 1

Developing Technological Fluency in and through Teacher Education: An Applied Research Project in Teachers' College

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ABSTRACT

Meaningful and authentic use of technology for quality teaching and meaningful learning is an essential component of a 21st century education. Teacher education programs have been slow to transform and adopt programs that are essential for new teachers to be equipped with skills for 21st century teaching. Professional development of veteran teachers faces challenges in format and delivery and teachers are slow to become enculturated in design inquiry learning infusing technology in meaningful ways that embrace digital citizenship to meet the needs of 21st century education. The project described in this chapter offers an innovative approach to professional learning in a partnership approach with teacher education students and veteran teachers to address the challenges faced by both teacher education programs and professional development models.

OVERVIEW

According to the OECD (2010) report on a systemic approach to technology-based school innovations, many of the challenges that confront education leaders today are propelled by an ICT-enabled global economy and by societal shifts that demand that more individuals achieve more advanced skills and learning capacities than ever before (p. 104). The research carried out by OECD identifies a need for

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strong teacher education programs, as well as appropriate professional development for in-service teachers, to ensure that all educators acquire the skills and develop the competencies needed for the provision of education in the 21st century.

In their chapter in the *Cambridge Handbook of The Learning Sciences*, (Bransford, et al, 2006) argue that, “if people are better prepared for future learning, they will be able to transfer that learning better and faster” (p. 27). Teacher education programs are the gateway through which all new teachers pass; collectively, we need to determine whether the curriculum of these programs has been designed to meet the needs of education for all learners in the 21st century by addressing the needs of pre-service teachers who will lead learning in contemporary classrooms. Second, even if our teacher education programs have a contemporary and well designed curriculum focused on preparing new teachers for innovative and transformative learning environments, we need to examine the capacity of teacher educators in teaching and leading in such a program. Finally, in-service teachers have their hands full addressing the outcomes of the present curriculum. There is a pressing need for well designed and continuous professional development to provide practicing teachers with the support they need to design inquiry-based learning experiences for their students. Overall, this chapter explores what elements need to be developed and present in teacher education and in professional development in order for education as a collective to provide learners with opportunities to connect, communicate, and collaborate with each other using technology in ethically responsible ways as they engage as members of a knowledge building community.

In order for students to learn skills and competencies needed for the 21st century, which is now a knowledge economy, the education system needs to be transformed (Levine, 2014). Education practices in many 21st century learning environments are still designed to meet the needs of citizens in an industrial age. In other words, many teachers are teaching in ways that prepare students for the past, and not for present realities. Research conducted by the Galileo Educational Network (Clifford, Friesen, & Lock, 2004) presents the landscape of education as follows:

The magnitude of the change in teacher thinking required for effective technology integration is enormous. The shift from industrial age practices of knowledge transmission to more constructivist understandings of the ways in which learners build understanding through active engagement with ideas, materials and one another is paradigmatic in scope, calling into question many of the most familiar routines and practices of teacher-centered classrooms (p. 90).

Two levers that enable reform in education include:

1. Professional development, and
2. Allocating adequate budgets (OECD, 2010).

DeLorenzo and Battino (2008) and Fullan (2011) state that a third lever is required for change to be implemented in the near term. This third lever is the “need for new student educational achievement assessments that measure the new types of skills and capacities needed in the 21st century ... as well as measures of innovative teaching practices that support these skills” (OECD, 2010, p. 105). Educational systems need to examine how to use the levers of professional development, assessment and appropriate resourcing to sponsor educational reforms for learning with technology.

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