

## Chapter 4

# Ecologies of Learning: Efficacious Learning and ICT Pedagogical and Technological Adaptability

**Don Krug**

*University of British Columbia, Canada*

**Jenny Arntzen**

*University of British Columbia, Canada*

### ABSTRACT

*In this chapter the authors present research that investigated the formation of ICT ecologies of learning in a Canadian teacher education program. The growth and development of ICT in Canada has placed tremendous responsibility on educators to be informed about not only acquiring ICT skills and knowledge (ICT literacies) but, more importantly, to understand the consequences of emerging social, technological, economic, and political ICT issues that hinder and/or enhance student learning, health, and knowledge. The authors' research project looked critically at Canadian educational contexts and how teacher candidates (TCs) are prepared to use ICT when entering the teaching profession. The authors highlight how a group of eight teacher candidate researchers (TCRs) engaged in efficacious learning.*

### ORGANIZATION BACKGROUND

The proliferation of Information and Communication Technologies (ICT) is challenging how and when learning occurs as well as the ways we live and think (Schofield, 1995; Turkle, 1996; Tapscott, 1998; Dexter, Anderson & Becker, 1999). ICT encompasses many different forms of digital media and technologies. For the purposes of this research, our focus was on educational hardware and software for facilitating pedagogical processes of communica-

tion, curriculum and research. Educators in Canada face emerging social, technological, economic, and political (STEP) issues as digital technologies infuse everyday experiences and impact people's abilities to construct meaningful and relevant understandings of the world in which we live (Anderson, 2000; Mayer, 2002, 2003; Spiro, et al., 1991). We view ICT ecologies of learning as conceptual positions that acknowledge that all contextual issues are multi-dimensionally and multi-directionally articulated by experiences, human socially interested agency, and environmental conditions. Research shows that ICT has increased the complexity of people's

DOI: 10.4018/978-1-61520-909-5.ch004

ways of living (culture), saturating experiences with profound challenges of pedagogical and technological adaptability (Foucault, 1982; Hall, 1981; Kirsh, 2000). In this chapter, we provide an overview of Canadian technology enabled learning within educational organizations in British Columbia (BC). We bring forward some of the core issues of ICT advancement in Canada. The growth and development of ICT in Canada has placed tremendous responsibility on educators to be informed about not only acquiring ICT skills and knowledge (ICT literacies) but, more importantly, to understand the consequences of emerging social, technological, economic, and political ICT issues on school cultures (Fullan, 1993; Schofield, 1995) that affect student learning, health, and knowledge (Maeroff, 2003).

### **SETTING THE STAGE**

Our research project looked critically at Canadian educational contexts and how teacher candidates (TCs) prepared to use ICT when entering the teaching profession. We have completed the second-year of a three-year study that focused on how one cohort of thirty-six elementary TCs accepted, resisted or opposed using ICT during their teacher education program (TEP) at the University of British Columbia (UBC). We wanted to know if TCs could study their own evolving pedagogical self-efficacy, as a means to increase their ICT knowledge and leadership in educational situations (Lorsbach & Jinks, 1999). According to Bandura (1995) self-efficacy is “the belief in one’s capabilities to organize and execute the courses of action required to manage prospective situations” (1995, p. 2). We hypothesized that pedagogical self-efficacy might enable TCs to make informed decisions about ICT pedagogical and technological adaptability, as well as eventually prepare K-7 students for an ever-changing knowledge-based society.

In 1994 Ross reviewed 88 studies of teacher efficacy in pre-college settings and identified potential connections with a teachers’ sense of efficacy and their practices. Ross stated that teachers with a strong sense of efficacy are more likely to (1) learn and use new approaches and strategies for teaching, (2) use management techniques that enhance student autonomy, (3) provide special assistance to low achieving students, (4) build students’ self-perceptions of their academic skills, (5) set attainable goals, and (6) persist in the face of student failure. There are several studies that examined teacher efficacy, however we did not assume that the findings from one study would transfer into our situation.

In this chapter, we briefly describe articulation(s) as a collaborative and reflexive research counter-methodology. We used articulation(s) to examine ICT, cultural, and educational relationships and to unsettle taken-for-granted assumptions, perspectives, and practices within the dynamic forces of change in the TEP at UBC. We follow with a discussion of Canadian (federal) and British Columbia (provincial) educational agencies in relation to social accessibility, economic viability, political engagement, and technological adaptability. Our research case is about the formation of ecologies of learning and ICT pedagogical and technological adaptability. We highlight how a group of eight teacher candidate researchers (TCRs) engaged in efficacious learning. Conceptual cycles of critical inquiry were introduced to the TCRs to help mediate the ICT challenges facing educators in their day-to-day teaching in BC. We provided professional education for the TCRs to enhance their ICT skills and confidence. We wanted to enable them to challenge their own, and other teacher’s, conceptual and practical use of ICT within the contextual conditions of educational ICT policies. These opportunities were offered over and above the instruction they received in the UBC teacher education program. In our research we found that critical inquiry supported their examination of

18 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:  
[www.igi-global.com/chapter/ecologies-learning-efficacious-learning-ict/42531](http://www.igi-global.com/chapter/ecologies-learning-efficacious-learning-ict/42531)

## Related Content

---

### Histograms for OLAP and Data-Stream Queries

Francesco Buccafurri (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 976-981).

[www.irma-international.org/chapter/histograms-olap-data-stream-queries/10939](http://www.irma-international.org/chapter/histograms-olap-data-stream-queries/10939)

### On Clustering Techniques

Sheng Maand Tao Li (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 264-268).

[www.irma-international.org/chapter/clustering-techniques/10831](http://www.irma-international.org/chapter/clustering-techniques/10831)

### Discovering Unknown Patterns in Free Text

Jan H. Kroeze (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 669-675).

[www.irma-international.org/chapter/discovering-unknown-patterns-free-text/10892](http://www.irma-international.org/chapter/discovering-unknown-patterns-free-text/10892)

### Multiple Criteria Optimization in Data Mining

Gang Kou, Yi Pengand Yong Shi (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 1386-1389).

[www.irma-international.org/chapter/multiple-criteria-optimization-data-mining/11002](http://www.irma-international.org/chapter/multiple-criteria-optimization-data-mining/11002)

### Preference Modeling and Mining for Personalization

Seung-won Hwang (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 1570-1574).

[www.irma-international.org/chapter/preference-modeling-mining-personalization/11028](http://www.irma-international.org/chapter/preference-modeling-mining-personalization/11028)