Preface

We're in the throes of a revolution. And the strange thing about living through a revolution is that it's very difficult to see what's going on.
(Naughton, 2012)

Revolutions have historical origins. They make way for future changes. They permeate deep layers of society and culture. They are the result of developments over time. Most often, revolutions come about because of the introduction of new technologies that make possible new ways of behaving, of practicing, even of thinking. The revolution that Naughton (2012) described came about as a result of the Internet, "a disruptive innovation" (p. 5) that, like the printing press, forever altered society, culture, and history. What does that technological revolution mean for higher education? Is higher education on the periphery of the revolution or is it about to be itself revolutionized? What would be needed for technology to bring about a revolution in education? How can we approach the study of this phenomenon while in the midst of its development and without underplaying its complexity?

For more than a decade, like many others, we have been conducting research on technology-mediated learning, writing papers and reports, and delivering presentations that grapple with these questions. Like others, we have tried various theories or frameworks, including Rogers' Diffusion of Innovation (Murphy, 2005), Transactional Distance Theory (Murphy & Rodriguez-Manzanares, 2008d), and the Learner-Centered Principles (Murphy & Rodriguez-Manzanares, 2008b; Murphy & Rodriguez-Manzanares, 2009a). We have investigated different types of technologies, such as instant messaging (Murphy & Rodriguez Manzanares, 2008c), satellite use (Murphy, 2003b), learning objects (Murphy, 2003c; Murphy, 2004d), online discussions (Murphy, 2001b; Murphy & Rodriguez Manzanares, 2006), and synchronous (Murphy, 2010) and asynchronous communication (Murphy, Rodriguez-Manzanares, & Barbour, 2011).

We have explored technology in relation to important concepts such as rapport (Murphy & Rodriguez-Manzanares, 2012), problem formulation and resolution (Murphy, 2004c), metacognition (Murphy, 2008), motivation (Murphy & Rodriguez-Manzanares, 2009c), collaboration (Murphy, 2004f), and critical thinking (Murphy, 2004a). We have studied technology in contexts of Music (Murphy, 2004b), Mathematics (Murphy, 1995a), and language learning (Murphy, 2001a; 1995b; 1995c; 1996; 1997; 1998). We have explored the instructors' (Murphy & Rodriguez-Manzanares, 2009b), the students' (Murphy, 2010), and the instructional designers' perspective (Murphy, 2003a). We have addressed issues related to the analysis of online discussions (Murphy, 2004e; Murphy, Ciszewska-Carr, & Rodriguez Manzanares, 2006; Murphy & Rodriguez Manzanares, 2006) and teachers' beliefs about teaching with technology (Murphy, 2002; Murphy, 2000).

Like those of many others, these attempts to understand and make sense of technology in education adopt a narrow focus that fails to account for the larger picture and the complexity of phenomena that are changing so quickly and so ubiquitously that the target seems to be in perpetual motion. Change, by definition, presupposes phenomena that have existed before or already. Seeing what is going on must, therefore, involve looking at a larger temporal picture of a phenomenon, i.e., not only looking at the revolution but where it came from and where it might be heading. Of course, any revolution has far-reaching systemic ramifications. Seeing what is going on, therefore, requires a broad spatial as well as temporal focus. Seeing what is going on requires what we colloquially call "looking at the big picture."

In the past, as researchers and authors, we have not been able to do that because we have lacked the analytical tools that might allow us to see the big picture, the historical development as well as the interrelated complexity of phenomena in learning and teaching settings. In the early part of the new millennium, however, we found such a tool: Activity Theory. It took time and practice before we began to appreciate how this theory might help us make sense of technology in education because the literature on the theory was as cumbersome as it was complex. However, once we began using Activity Theory, we realized we had finally discovered an effective means of making sense of technology in higher education. This book represents a culmination of that process as well as a desire on our part to share Activity Theory with others, to initiate them into it, and to invite them to adopt the theory in order to see what is going on in the throes of the revolution, but, more importantly, to be able to use the theory to expand and transform higher education into a more culturally and socially advanced activity.

A value of Activity Theory is that it factors in development over time. The development is understood and considered in terms of development towards more culturally and socially advanced activities, from the point of view of those engaged in them. The development occurs because of needs within the activity system. Tools are the means to fulfil those needs. As needs are progressively met, the subjects in an activity system move on to fulfillment of more advanced needs. That fulfillment drives the creation and re-creation of tools. This circular, iterative process is not a technologically-deterministic one. Tools are not the driver in the system. Needs are the energy and driving force. However, without tools, needs could never be met and humans would still be at the level of the caveman, if not already extinct. Instead, that process has led to development at all levels, including the social and cultural. The development is not a simple linear one by which a need is felt and fulfilled and a new tool created. Throughout the process, there are periods in which development accelerates exponentially.

One example of this exponential development is what occurred as a result of the creation of the printing press as fulfillment of the need to facilitate the activity of mass distribution of printed material. Yet, the period of acceleration that resulted from the development of the printing press is slow compared to the speed of development that occurred with the emergence of personal computing devices combined with the Internet. The main difference between the two periods of development is the difference between "for" and "by" the masses. The printing press, like many other developments in tools, allowed for better, more efficient production for the masses. It was not a new invention as such, but merely a mechanism or means to meet the need to produce more than one document at a time by one person. Improvements in that production subsequently accelerated development in many aspects of human life: cultural, social, political, etc.

What makes the emergence of personal computing devices combined with the Internet much more significant in terms of accelerating the speed of development is that, unlike any prior tools, these tools are in the hands of the masses. Mass access to the tools exponentially accelerates development, simply

because there are more individual instances of needs being met and tools redeveloping. More importantly, compared to the printing press, which simply mechanized a function, modern computing and networked devices facilitate and enable the creation of other tools. As an example, the emergence of computers and the Internet supported the development of a tool for mass knowledge creation and sharing, i.e., Wikipedia. What makes the development of those types of tools highly significant is that they make possible new forms of activity. In the past, people shared knowledge and a few used the tools to create knowledge (e.g., Encyclopaedia Britannica). Now, that expertise and power for knowledge creation and sharing is more broadly distributed and allows production of knowledge *by* the masses.

Activity Theory provides a framework that allows appreciation of the complexity of development that can come about as a result of the Internet and the proliferation of personal computing devices because it factors in many components, including the division of labour in relation to how these tools are controlled. It factors in the communities of use, norms around tool use, and the object for and the outcomes of tool use. In that sense, an Activity Theory perspective involves using a "socio-cultural, socio-historical lens" (Uden, Richards, & Gašević, 2008, p. 16) to focus not specifically nor solely on technology, but on elements in the setting in which the technology is used.

Activity Theory is basically a sense-making tool for taking into account cultural and historical development in complex systems such as higher education. It is particularly useful for real-life studies of technology to help the researcher analyzing data to identify important phenomena and relationships between them and to break data into manageable units of analysis, yet, at the same time, preserving the structure of the whole (Kaptelinin & Nardi, 2006). It provides a non-reductionist perspective in that it conceptualizes practice within a system (Barab, Barnett, Yamagata-Lynch, Squire, & Keating, 2002) and the subject interacting with the world (Kaptelinin & Nardi, 2006). The theory unifies thought and activity (Zinchenko, 1996) and "constructs the individual as a technologically empowered and socially contextualized subject" (Kaptelinin & Nardi, 2006, p. 199).

Activity Theory has had a versatile use in education. For example, it has been used to understand and interpret phenomena such as: teachers' practices and how their teaching is restructured when a new technology becomes part of their teaching activity (e.g., Buell, 2004), the introduction of new technology and teachers' beliefs (e.g., Anthony, 2012; Buell, n.d.; Hu & Webb, 2009; Karasavvidis, 2009; Lim & Hang, 2003; Russell & Schneiderheinze, 2005; Yamagata-Lynch, 2007), students' histories of technology use and their resistance to new tools (e.g., Blin, 2004), group processes in online learning (e.g., Brine & Franken, 2006), and online collaborative writing among English as foreign language students (e.g., Blin & Appel, 2011).

In relation to technology-mediated or e-learning and online learning, Activity Theory facilitates consideration of the practices of individual students and educators both "at the macro… and the micro-organisational levels" (Benson, Lawler, & Whitworth, 2008, p. 456). The theory is suited to examining shifts in educational practices, such as those brought about by technology, and for engaging in collaborative reflection about change (Buell, n.d.). In general, Activity Theory has the "potential to be a pathbreaker in studies that help humans gain control over their own artifacts and thus over their future" (Engeström, 1999a, p. 29).

Nardi (1996b) summarized the value of Activity Theory and outlined its overall contribution:

I have found activity theory compelling because it weaves together, in a single coherent framework, so many interesting theoretical constructs crucial to an understanding of human activity: dynamic levels of activity, mediation, contradiction, intentionality, development, history, collaboration, functional organ, the unity of internal and external. Other theoretical frameworks treat these constructs individually, or in less rich form, or not at all. (p. 375)

We too find Activity Theory highly compelling. We also find compelling the potential developments that give hints of new forms of learning that are evolving because of the rapid changes in tools, or what individuals tend to refer to more generally as technology. Higher education is a very complex phenomenon that not only includes many elements and actors, but is also part of a larger phenomenon of technological development occurring in the world in general. Activity Theory can take that complexity and focus it in order to make sense of the developments as well as potentially direct them.

The purpose of the book is to explain and illustrate how Activity Theory can help make sense of technology in higher education. The principal audience for this book is researchers, academics, and any others interested in inquiring into technology in higher education. At the same time, this book may also be of interest to others such as policy makers, administrators, and instructors in higher education. Although this book focuses on higher education, researchers interested in inquiry into technology use at other levels of learning may also find that the book can provide many valuable insights for them.

In spite of the power of Activity Theory to help make sense of technology in higher education, there have been no other books that have adopted an Activity Theory perspective on technology in higher education. This lacuna may be due to the "unfriendliness" of the theory and to its complex concepts, principles, and origins. That is why this book aims to present a friendlier version of the theory; one that relies on illustration with examples in hypothetical and real contexts of use of technology in higher education. The emphasis in this book is on theory and on practice, on the past and the future, the individual and society in an attempt to shed important insights into the potential for transformation of higher education. Ultimately, that potential for transformation is what this book is essentially about.

ORGANIZATION OF THE BOOK

The book is organized into eleven chapters. Each chapter is linked to the others and each begins with a brief description of the chapter's relationship with the one that preceded it. Likewise, the chapters conclude with a summary and a brief description of the content of the subsequent chapter. Section 1 describes and illustrates the main constructs and principles of Activity Theory. The illustration and description are contextualized in relation to technology in higher education. Section 2 moves beyond an explanation and illustration of Activity Theory to an actual application of the theory to two studies of technology and higher education international students. The specific contents of the chapters are indicated below.

Chapter 1 presents an Activity Theory perspective on technology in a context of higher education. It introduces the reader to the basic constructs and principles of Activity Theory through the experiences of a hypothetical first-year university student, Anne. Her experiences highlight the complex role that technology can play in reshaping and disrupting forms of learning that are deeply rooted in cultural, historical, and social traditions. The chapter sets the stage for the argument that Activity Theory explains technology's role in the development and transformation of learning and provides a framework to make sense of these transformations.

Chapter 2 provides an overview of Activity Theory. It outlines the origins and development of the theory, situates it in relation to other approaches, and explains the important role of history and culture in the theory. The second part of the chapter provides an overview of the components of an activity system: subject; object; outcomes; tools; community; division of labour; and norms. The chapter devotes particular attention to the component of tools, then presents and summarizes their importance in seven propositions using examples from higher education. The chapter follows with a discussion of the role of ethics, values, and emotions in Activity Theory and includes a visual representation of the activity system of Activity Theory.

Chapter 3 presents a review of studies and reports of students' use of technology in higher education published primarily in the U.S. and Canada from 2005 to 2012. The review is conducted using an Activity Theory framework that organizes information from the literature according to the components of the activity system—subject, tools, object, norms, community, division of labour, and outcomes. The chapter concludes with a summary of the activity system and limitations of the approach.

Chapter 4 is about how new forms of activity emerge in higher education and the role that contradictions in general and tools specifically play in that emergence. Activity system components such as norms, division of labour, and tools develop but at different rates and in different ways over long periods of time. Likewise, different activities may share a component but the component may be more developed in one activity than in the other. The development at different stages means that there are always disconnects within and between activity systems. Activity Theory calls these disconnects by the term contradictions. The chapter begins with an overview of contradictions. It follows with hypothetical examples to illustrate contradictions in a context of technology-mediated higher education. The second part of this chapter provides an overview of how contradictions have been used to analyze technology and learning.

Chapter 5 illustrates Activity Theory's principle of expansive learning. It begins with an overview of expansive learning followed by description of a hypothetical, more culturally and historically developed form of the activity of higher education. The description is organized according to the seven components of the activity system. The outcomes of this hypothetical, transformed form of learning are the realization or near realization of the zone of proximal development and co-actualization. Following the description of the components of an expanded, more developed form of higher education, are the identification and analysis of three contradictions that must be resolved in order for the expansion to take place. The chapter concludes with a discussion of how the expansive transformation of higher education might be realized and the role that contradictions could play in this transformation.

Chapter 6 serves as an introduction to the two studies featured in Section 2 (Chapters 7-10). It presents a review of a decade (2002-2012) of nine Activity Theory studies from peer-reviewed journals of higher education students' learning in technology-mediated contexts. The review is organized around the following elements: purpose; rationale for Activity Theory use; summary of technology use; focus on technology-mediated learning; data collection; data analysis; findings, conclusions, and implications. The methods section provides an overview of why the nine studies were included while others were excluded. The chapter includes a comparison of the nine studies with those presented in Section 2, Chapters 7-10.

Chapter 7 reports on a survey of 87 graduate and undergraduate international students at Memorial University of Newfoundland, Newfoundland and Labrador, Canada. The survey was focused on the components of the activity system of subject, tools, object, outcomes, community, division of labour, and norms. The international students represented 31 programs or fields of specialization and 21 dif-

ferent first languages. The chapter presents a comparison of the findings of the study with the literature on higher education domestic and international students and technology. It identifies the contradictions that would need to be overcome in order for expansive transformations to occur.

Chapter 8 presents findings of a study of the activity systems of seven international students enrolled in online learning at Memorial University of Newfoundland, in the province of Newfoundland and Labrador, Canada. The seven students were interviewed using questions focused around the components of an activity system. Data were analyzed using a coding protocol designed for the study and based on Activity Theory. Findings are presented as seven individual portraits of the activity system of students. Each portrait is summarized according to the following components: subject, object, tools, norms, community, division of labour, outcomes.

Chapter 9 presents the results of a cross-analysis of the seven portraits of the activity systems of higher education international students in online learning. The cross-analysis relies on Activity Theory as a tool to identify and sort patterns in the data, in this instance across seven portraits. The cross-analysis aggregates findings from across all seven portraits into the Activity Theory components of subject, object, tools, norms, community, division of labour, and outcomes. The chapter provides an aggregate portrait of the activity system of the seven students.

Chapter 10 features a description of three contradictions (i.e., disconnects) in the activity system of international higher education students in online learning. These disconnects are interpreted in relation to the constructs of teaching, real, learning, social, and cultural presence and analyzed in terms of their origins in face-to-face, time- and place-dependent contexts of learning. Teaching presence is the external (to the student) regulation and management of learning, real presence is the sensory-rich character of learning, and social and cultural presence relate to specific types of interactions and communication that occur in conjunction with learning. Learning presence reflects a constructivist perspective that values socially-constructed forms of knowledge and self-regulation. The chapter follows with a description of how the disconnects can be bridged and the activity system expanded.

Chapter 11 begins with a discussion of the value of having adopted an Activity Theory perspective to write this book. It follows with consideration of the role of tradition and beliefs in transforming higher education. The subsequent sections summarize opportunities for expansion that readers may take away from this book as implications for policy and practice. These relate to expansion of conceptions of learning; control; support; tools; and boundaries. The chapter concludes with limitations of this book and of Activity Theory in general.

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REFERENCES

Anthony, A. B. (2012). Activity theory as a framework for investigating district-classroom system interactions and their influences on technology integration. *Journal of Research on Technology in Education, 44*(4), 335-356.

Barab, S. A., Barnett, M., Yamagata-Lynch, L., Squire, K., & Keating, T. (2002). Using activity theory to understand the systemic tensions characterizing a technology-rich introductory astronomy course. *Mind, Culture, and Activity, 9*(2), 76-107. doi: 10.1207/S15327884MCA0902_02

Benson, A., Lawler, C., & Whitworth, A. (2008). Rules, roles and tools: Activity theory and the comparative study of e-learning. *British Journal of Educational Technology, 39*(3), 456-467. doi: 10.1111/j.1467-8535.2008.00838.x

Blin, F. (2004). CALL and the development of learner autonomy: Towards an activity-theoretical perspective. *ReCALL, 16*(2), 377-395. doi: 10.1017/S0958344004000928

Blin, F., & Appel, C. (2011). Computer supported collaborative writing in practice: An activity theoretical study. *CALICO Journal, 28*(2), 473-497.

Brine, J., & Franken, M. (2006). Students' perceptions of a selected aspect of a computer mediated academic writing program: An activity theory analysis. *Australasian Journal of Educational Technology, 22*(1), 21-38. Retrieved from http://www.ascilite.org.au/ajet/ajet22/brine.html

Buell, J. P. (2004). Learning to teach with laptops: A case study of teacher change. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2004* (pp. 1984-1985). Chesapeake, VA: AACE.

Buell, J. P. (n.d.). *COWS in the classroom: Technology introduction and teacher change through the lens of activity theory*. Unpublished manuscript. University of Illinois at Urbana-Champaign.

Engeström, Y. (1999a). Activity theory and individual and social transformation. In Y. Engeström, R. Miettinen, & R.-L. Punamäki (Eds.), *Perspectives on activity theory* (pp. 19-38). Cambridge: Cambridge University Press.

Hu, L., & Webb, M. (2009). Integrating ICT to higher education in China: From the perspective of activity theory. *Education and Information Technologies, 14*(2), 143-161. doi: 10.1007/s10639-008-9084-6

Kaptelinin, V., & Nardi, B. A. (2006). *Acting with technology: Activity theory and interaction design*. Cambridge, MA: MIT Press.

Karasavvidis, I. (2009). Activity theory as a conceptual framework for understanding teacher approaches to Information and Communication Technologies. *Computers & Education, 53*(2), 436-444. doi: 10.1016/j.compedu.2009.03.003

Lim, C. P., & Hang, D. (2003). An activity theory approach to research of ICT integration in Singapore schools. *Computers & Education, 41*(1), 49-63. doi: 10.1016/S0360-1315(03)00015-0

Murphy, E. (1995a). E-Mail math. Teaching mathematics. *NLTA Mathematics Council Newsletter, 22*(2), 5-6.

Murphy, E. (1995b). Stemnet en Français. *Voyons: Modern Languages Council Bulletin*.

Murphy, E. (1995c). Towards the global classroom: The French immersion teacher's guide to the Internet. *Journal of Immersion Teachers, 18*(2), 37-40.

Murphy, E. (1996). Cross-Canada conferencing. *Journal of Immersion Teachers, 19*(3), 25-26.

Murphy, E. (1997). Je change, donc je suis: New teaching methodologies for the digital age. *Journal of Immersion Teachers, 18*(2), 37-40.

Murphy, E. (1998). Technology in Newfoundland French classes. *Voyons: Modern Languages Council Bulletin.*

Murphy, E. (2000). *Strangers in a strange land: Teachers' beliefs about teaching and learning French as a second or foreign language in online learning environments* (Doctoral dissertation). Retrieved from http://www.nald.ca/library/research/stranger/cover.htm

Murphy, E. (2001a). A review of the use of technology in second-language learning. *Journal of Immersion, 23*(2), 10-15. Retrieved from http://www.ucs.mun.ca/~emurphy/technology.htm

Murphy, E. (2001b). Investigating the multiple worlds of teaching through multiloguing. *Educational Technology & Society, 4*(3). Retrieved from http://www.ifets.info/journals/4_3/murphy.html

Murphy, E. (2002). New tools in an old trade: Teachers talk about use of the internet in the teaching of French as a second or foreign language. *Canadian Modern Language Review, 59*(2), 215-235. doi: 10.3138/cmlr.59.2.215

Murphy, E. (2003a). Moving from theory to practice in the design of web-based learning from the perspective of constructivism. *The Journal of Interactive Online Learning, 1*(4). Retrieved from http://www.ncolr.org/jiol/issues/pdf/1.4.4.pdf

Murphy, E. (2003b). *Provincial report of the Telesat multimedia satellite trials for schools: Newfoundland schools*. St. John's: Memorial University of Newfoundland. Prepared for the Canadian Education Association.

Murphy, E. (2003c). *Record of activities: Learning objects pilot*. St. John's: Memorial University of Newfoundland. Prepared for Industry Canada.

Murphy, E. (2004a). An instrument to support thinking critically about critical thinking in online asynchronous discussions. *Australasian Journal of Educational Technology, 20*(3), 295-316. Retrieved from http://www.ascilite.org.au/ajet/ajet20/murphy.html

Murphy, E. (2004b). *Final summative evaluation report of the MusicGrid project*. St. John's: Memorial University of Newfoundland.

Murphy, E. (2004c). Identifying and measuring problem formulation and resolution in online asynchronous discussions. *Canadian Journal of Learning and Technology, 30*(1), 5-20. Retrieved from http://www.cjlt.ca/index.php/cjlt/article/view/122/116

Murphy, E. (2004d). Moving from theory to practice in the design of web-based learning using a learning object approach. *E-Journal of Instructional Science and Technology, 7*(1). Retrieved from http://www.ascilite.org.au/ajet/e-jist/docs/Vol7_No1/content2.htm

Murphy, E. (2004e). Promoting construct validity in instruments for the analysis of transcripts of online asynchronous discussions. *Educational Media International, 41*(4), 346-354. Retrieved from http://www.ucs.mun.ca/~emurphy/REMI410407.pdf

Murphy, E. (2004f). Recognising and promoting collaboration in online asynchronous discussions. *British Journal of Educational Technology, 35*(4), 421-431. doi: 10.1111/j.0007-1013.2004.00401.x

Murphy, E. (2005). Issues in the adoption of broadband-enabled learning. *British Journal of Educational Technology, 36*(3), 525-536. doi:10.1111/j.1467-8535.2005.00490.x

Murphy, E. (2008). A framework for identifying and promoting metacognitive knowledge and control in online discussants. *Canadian Journal of Learning and Technology, 34*(2). Retrieved from http://www.cjlt.ca/index.php/cjlt/article/view/491/222

Murphy, E. (2010). Online synchronous communication in the second-language classroom. *Canadian Journal of Learning and Technology, 35*(3). Retrieved from http://www.cjlt.ca/index.php/cjlt/article/view/539/262

Murphy, E., Ciszewska-Carr, J., & Rodriguez Manzanares, M. A. (2006). Methodological issues in the content analysis of online discussions. *The Journal of the Research Center for Educational Technology, 2*(2). Retrieved http://www.rcetj.org/index.php/rcetj/article/view/90/138

Murphy, E., & Rodriguez Manzanares, M. A. (2006). Profiling individual discussants' behaviours in online asynchronous discussions. *Canadian Journal of Learning and Technology, 32*(2), 59-77. Retrieved from http://cjlt.csj.ualberta.ca/index.php/cjlt/article/view/55/52

Murphy, E., & Rodriguez-Manzanares, M. A. (2008b). High school teachers' beliefs about learner-centered teaching with technology. *E-Learning, 5*(4), 384-395. doi: 10.2304/elea.2008.5.4.384

Murphy, E., & Rodriguez Manzanares, M. A. (2008c). Instant messaging in a context of virtual schooling: Balancing the affordances and challenges. *Educational Media International, 45*(1), 47-58. doi: 10.1080/09523980701847180

Murphy, E., & Rodriguez-Manzanares, M. A. (2008d). Revisiting transactional distance theory in a context of web-based high school distance education. *Journal of Distance Education, 22*(2), 1-14.

Murphy, E., & Rodriguez-Manzanares, M. A. (2009a). Learner-centredness in high-school distance learning: Teachers' perspectives and research-validated principles. *Australasian Journal of Educational Technology, 25*(5), 597-610. Retrieved from http://www.ascilite.org.au/ajet/ajet25/murphy.html

Murphy, E., & Rodriguez-Manzanares, M. A. (2009b). Research on the e-teacher in the K-12 distance education classroom. In P. Rogers, G. Berg, J. Boettcher, C. Howard, L. Justice, & K. Schenk (Eds.), *Encyclopedia of distance learning* (pp. 1744-1778). Hershey, PA: Information Science Reference. doi: 10.4018/978-1-60566-198-8.ch261

Murphy, E., & Rodriguez-Manzanares, M. A. (2009c). Teachers' perspectives on motivation in high-school distance education. *Journal of Distance Education, 23*(3), 1-24. Retrieved from http://www.jofde.ca/index.php/jde/article/view/602/971

Murphy, E., & Rodriguez-Manzanares, M. A. (2012). Rapport in distance education. *International Review of Research in Open and Distance Learning, 13*(1), 167-190. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1057/2076

Murphy, E., Rodriguez-Manzanares, M. A., & Barbour, M. (2011). Asynchronous and synchronous online teaching: Perspectives of Canadian high school distance education teachers. *British Journal of Educational Technology, 42*(4), 583-591. doi: 10.1111/j.1467-8535.2010.01112.x

Nardi, B. A. (1996b). Epilogue. In B. A. Nardi (Ed.), *Context and consciousness: Activity theory and human-computer interaction* (pp. 375-380). Cambridge: MIT Press.

Naughton, J. (2012). *From Gutenberg to Zuckerberg: What you really need to know about the Internet.* London: Quercus.

Russell, D. L., & Schneiderheinze, A. (2005). Understanding innovation in education using activity theory. *Educational Technology and Society, 8*(1), 38-53. Retrieved from http://www.ifets.info/journals/8_1/7.pdf

Uden, L., Richards, G., & Gašević, D. (2008). Activity theory for technology integration. In L. A. Tomei & R. Morris (Eds.), *Encyclopedia of information technology curriculum integration* (pp. 14-21). Hershey, PA: IGI Global.

Yamagata-Lynch, L. C. (2007). Confronting analytical dilemmas for understanding complex human interactions in design-based research From a Cultural-Historical Activity Theory (CHAT) framework. *Journal of the Learning Sciences, 16*(4), 451-484. doi: 10.1080/10508400701524777

Zinchenko, V. P. (1996). Developing activity theory: The zone of proximal development and beyond. In B. A. Nardi (Ed.), *Context and consciousness: Activity theory and human-computer interaction* (pp. 283-324). Cambridge, MA: MIT Press.