



# Integrating ICT into Higher Education: A Study of Onsite vs. Online Students' and Professors' Perceptions

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## ABSTRACT

*For the past two decades, information and communication technologies (ICT) have transformed the ways professors teach and students learn. This study aims to investigate the perceptions of onsite and online students and professors. It was conducted into ICT-supported or technology-rich environments at a Faculty of Administration of a large Canadian university. To conduct the study, a moderator-type theoretical research model was developed, out of which nine hypotheses were formulated. We used a multimethod approach to collect data, that is, a Web survey involving open- and closed-ended questions, as well as a structured interview. The sample was composed of 313 students who completed an electronic survey on a Web site and 16 professors teaching to these students who participated in a structured interview. The quantitative data analysis was performed using a structural equation modeling software, that is, Partial Least Squares (PLS); the qualitative data were analyzed following a thematic structure using QSR NVivo software.*

*Keywords: hybrid learning; impact of pedagogy; multimethod approach; moderator-type model; online learning; onsite learning; students' perception; technology-rich environments*

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## INTRODUCTION

For the past two decades, information and communication technologies (ICT) have transformed the ways professors teach and students learn. Some professors have actively shifted the information flow of a face-to-face mode (student

listening, onsite presence) to an entirely online mode (student reading, onsite nonpresence); that is, they have designed courses and curricula that are offered completely online using the Internet and the Web. Others have developed the hybrid or blended mode (a combination of

face-to-face and online activities; less student onsite presence, ongoing use of ICT both inside and outside the classroom). Hence, knowledge acquisition and dissemination have been transformed, and new methods developed in order to satisfy the rapidly evolving needs of a population of individuals in search of more knowledge, heterogeneous, and geographically distributed.

In today's global economy, organizations (including universities) who want to survive and strive to stay highly competitive must continually innovate at the human, material, and technological levels. Alavi and Leidner (2001) pointed out that, during the past decade, universities and corporate training facilities have at an increasing rate invested in ICT to improve education and training. Marshall (2002) added that actual classrooms are now more and more enriched by technology. Recent studies by the National Center for Education Statistics (Waits & Lewis, 2003) and the Sloan Consortium (Allen & Seaman, 2004, 2005, 2006) showed a growing appeal and acceptance of online learning. And Giddens (1999) stated that one of the more important functions of the university is to allow people to play a significant role in today's new economy. Thus, universities, faculties, and professors are currently looking for ways to improve teaching and curricula, as well as develop new modes capable of satisfying the actual and future needs of organizations and societies. Out of their recursive attempts, the four fundamental questions often revisited are the following: (1) What are we teaching? (2) What should we be teaching? (3) What is the best way to teach it (pedagogy)? and (4) What are the impacts on students?

The study described in this article aims at helping universities to stay highly competitive in the current global shift in higher education. It uses an innovative approach to explore new directions regarding the last two questions above. We examine the relation between students' learning outcomes (undergraduate and graduate students) and learning environments all integrating ICT. Specific relations between student onsite presence and student online presence

are examined as to identify their effect on the basic relation between learning environments and students' learning outcomes. In fact, this study compares onsite technology-rich hybrid or blended learning environments and online learning environments. Moreover, this study brings to the foreground several moderator variables related to students' characteristics (psychology) and professors' pedagogy in order to better understand the relation between learning environments and students' learning outcomes. Therefore, the objective of this study is twofold: (1) to verify whether there are effectiveness-, performance-, and satisfaction-related differences between learning outcomes of onsite students and of those taking the same courses online; and (2) to verify whether students' characteristics and professors' pedagogy are important factors to consider when examining the relation between learning environments and students' learning outcomes.

Building on questions 3 and 4 raised previously (professor's pedagogy and impacts on students), this study focuses on the following three research questions: (1) Are there differences between learning outcomes of onsite students and of those taking the same courses online? If so, which ones? (2) Do students' characteristics have an influence on the relation between learning environments and students' learning outcomes, and are there differences in this influence between onsite and online students? If so, which ones? and (3) Does professors' pedagogy have an influence on the relation between learning environments and students' learning outcomes, and are there differences in this influence between onsite and online students? If so, which ones?

The article builds on a framework suggested by Fillion (2004) in the conduct of hypothetico-deductive scientific research in organizational sciences, and it is structured as follows. First, the theoretical background supporting the study is examined; second, the methodology followed to conduct the study is described; third, the results of the study are reported (we present a summary of the quantitative results got from students which are supported and

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