A DESCRIPTIVE ANALYSIS OF STUDENTS’ AND INSTRUCTORS’
PERCEPTIONS OF TECHNOLOGIES FOR LEARNING AT A COMMUNITY
COLLEGE IN PRINCE EDWARD ISLAND

by

Krystine M. Richards

A Signature Project Presented in Partial Fulfillment
of the Requirements for a
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ABSTRACT

Computers and the Internet have revolutionized communication and information sharing, which is having a significant impact on education. As technologies continue to evolve, traditional post-secondary institutions, such as Holland College, are faced with the challenge of adapting curriculum and delivery methods to meet the changing needs of students, instructors, and industry through electronic learning (e-learning). In order to achieve success in the area of e-learning, the College must first determine the needs and expectations of two key stakeholder groups, the students and instructors; who, until now have been relatively silent. The purpose of this quantitative research was to inquire about students’ and instructors’ expectations and overall perceptions of technologies used for learning. The study analyzed the secondary data provided by the College which included responses from 533 student and 109 instructor surveys concerning their perceptions of technologies for learning, and more specifically the benefits, use patterns, importance, and challenges of technologies for learning. The data revealed the primary benefit of e-learning was for academic achievement. The majority of students and instructors use technology on a daily basis for education. Desktop computers or portable computers were the technologies used most often for learning. Wireless Internet access and campus computer labs were identified as extremely important for learning. While the lack, or malfunctioning, of wireless Internet and campus computer labs were identified as significant challenges.
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CHAPTER 1: INTRODUCTION

Computers and the Internet have revolutionized how people communicate and disseminate information, resulting in a significant impact on education and learning. In the first decade of the 21st century, the proliferation of technologies used for learning, including electronic learning (e-learning), online courses, virtual schools, social media, and new computing devices, has rapidly changed the learning environment (Hall & Cotterill, 2008). All levels of education have been impacted by these new learning technologies, however none more so than the post secondary education system, as students are now in the position to learn anywhere, anytime (Wagner, Hassanein, & Head, 2008). As Frand (2000) noted, “most students entering colleges and universities today are younger than the microcomputer, are more comfortable working on a keyboard than writing in a spiral notebook, and are happier reading from a computer screen than from paper in hand.”

The management of Holland College, the community college of Prince Edward Island, is acutely aware of this phenomenon. Administrators at the College recognize that an understanding of e-learning and how technology can be used to enhance learning, instruction, and program delivery may prove to be critical to the College’s success in the years to come. But how can a traditional institution founded on practical hands-on, competency-based training embrace the fast pace of innovation in education related technologies? How can the management team remain responsive to students and instructors who are attracted to the College because of its face-to-face teaching model? And how can the management team meet the evolving needs of the knowledge-based economy if the College doesn’t adapt its traditional teaching methods? These questions have challenged the management of Holland College for years (S. Sweet, personal communication, July, 2010).
In an effort to address these concerns, the management team formed the E-learning Advisory Committee in 2007. The purpose of the Committee was to provide strategic direction and oversight for the implementation of e-learning technologies within the College. The objective was to develop a comprehensive, sustainable, iterative e-learning strategy. In order to meet that objective an action plan was devised so the College could adopt a phased approach to the strategy development (S. Sweet, personal communications, July, 2010).

The action plan allowed for unstructured and organic growth of several e-learning initiatives; however the College management team is concerned that the overall implementation of e-learning has been relatively conservative, initiatives have not been tracked, and the definitive strategy has yet to be developed. Furthermore, no effort has been made to gather direct feedback from students and instructors concerning e-learning (K. Heckbert, personal communication, September 2010). Yet a review of the literature suggested that successful implementation of e-learning is dependent on the extent to which the needs and concerns of the stakeholder groups involved are addressed (Wagner et al., 2008). While a number of e-learning stakeholders were identified in the literature, as of the fall of 2010, the Holland College management team’s discussions about e-learning were devoid of the perspectives of students and instructors. As the students are the primary consumers and the instructors are the primary distributors of learning, their opinions are vital to the development of strategies related to e-learning at Holland College.

This quantitative descriptive research seeks to provide insight into the perceptions of Holland College students and instructors with regards to technologies applied to learning. The study identifies the perceptions of students and instructors related to: benefits of a technology-rich learning environment, the technologies used for learning and teaching, the importance of
certain technologies to learning, and the challenges that are hindering the e-learning environment at Holland College. The results of the study may provide the management of Holland College with additional information concerning student and instructor perceptions of e-learning and technology to enable the College to develop a stakeholder-centric needs-based e-learning strategy.

Chapter 1 provides an introduction to the research by presenting background information to support the purpose and nature of the study. The background is followed by the problem statement, purpose, and significance of the study. The next section includes an overview of the methods including the nature of the study, research questions, and assumptions. Chapter 1 concludes with a description of the organization of the thesis.

Background

The purpose of the background section is to lay the foundation for the study. Terminology and context clarifications are provided to support and frame the research. The section provides an overview of the college system in Canada, outlines the organizational structure of Holland College, and describes the extent of e-learning in practice at Holland College. The conclusions drawn from the background lead into the description of the problem this study seeks to address.

*College System in Canada*

Community colleges in Canada typically specialize in post-secondary education that focuses on workforce skills and training (Snowdon, 2005). College-level training is usually completed over an eight to thirty-six month period. Upon completion, students receive a diploma or certificate in a particular occupational area, with many of these programs offering articulation
to university degree programs. Throughout Canada, there are established privately and publicly
funded colleges designed to meet the specific workforce needs of the local communities in which
the College exists (S. Sweet, personal communications, July, 2010).

*Holland College Organizational Overview*

Holland College is the provincial community college of Prince Edward Island. Founded
in 1969, the College responded to a recognized need for a more skilled labour force (Holland
College, 2010). The College offers over 65 post-secondary diploma and certificate programs,
which encompasses approximately 1400 individual courses. The main focus of the College is
full-time, classroom-based, post-secondary training. In addition, the College offers part-time
training, adult education upgrading, and continuing education programs. Although the College
was originally established to meet the needs of Prince Edward Islanders, due to the unique
program offerings over 35 percent of students at the College are from outside of the province
(Holland College, 2010).

The management of Holland College prides itself on the competency-based training
model, reputation of excellence, unique course offerings, industry experienced instructors, and
high employment rate of graduates (D. Beaton, K. Heckbert, M. O’Grady, S. Sweet, personal
communications, September, 2010). The College has been differentiated from other colleges in
the Atlantic Canadian region through the establishment of specific programs, such as culinary
arts and policing. The Culinary Institute of Canada, a division of Holland College, is regarded by
the industry as the premiere culinary school in Canada. Students are recruited from around the
world to attend the Institute (D. Beaton, personal communications, September 2010). The
Atlantic Police Academy, another division of Holland College, is the only recognized police
cadet training school among the nearby provinces of Nova Scotia and New Brunswick. The
culinary and policing programs are vital to the College's success; however, the College is continually expanding program offerings to meet industry trends and market demands. An example of program expansion has been observed through the transition and adaptation of full-time classroom-based training into part-time short courses and online formats (M. O’Grady, personal communications, August, 2010).

**E-learning at Holland College**

E-learning has yet to be formally defined as it pertains to the College and there are no stated policies or procedures governing e-learning. The E-learning Advisory Committee, consisting of six middle-to-upper level managers, was formed in 2007 to provide strategic direction and oversight for the implementation of e-learning within the College. The Committee has representation from the Justice Knowledge Network (a division of Holland College), Programs, Computer Services, and Curriculum Services. All of these groups are also represented on the Information Technology (IT) Policy Committee, which oversees the computer services and technology requirements within the College. The Curriculum Services department is primarily responsible for the implementation of e-learning initiatives, with guidance and direction from both the IT and E-learning committees to ensure departmental cohesion (A. Penner, personal communications, July, 2010).

The majority of classrooms at Holland College are outfitted with technology hardware, such as interactive whiteboards and projectors. Beyond this, Holland College utilizes a Learning Management System (LMS) to support e-learning. An LMS is a software application for the administration, documentation, tracking, and reporting of training programs, classroom and online events, e-learning programs, and training content (Ellis, 2009). Various LMS systems have been implemented at the program level within Holland College. In an effort to streamline
systems, the management launched a College-wide LMS, branded as the ‘Student Achievement Manager’ or ‘SAM’ in 2008 (H. Beattie, personal communications, July, 2010).

SAM enables online access to a broad spectrum of curriculum, services, and information for students and instructors, thereby acting as the main e-learning platform at Holland College. Instructors use SAM to interact with students by sharing content, posting assignments, receiving assignments, and testing students. Instructors interact with one another through Learning Object Repositories (LOR). These databases, accessible via SAM are used to store course information. While using a LOR is not e-learning, it facilitates the sharing of both e-learning and face-to-face course content. Recently, SAM has been used as a grade-book, allowing students easy access to grades and providing instructors with an efficient grading system. In a very basic form, the grade-book in SAM is allowing for e-learning to take place through the sharing of information between students and instructors (H. Beattie, personal communications, July, 2010).

To meet the educational objectives of the different programs, three curriculum consultants support the instructors in course and program development. The curriculum consultants may assist in the pedagogy surrounding e-learning, but are not instructional designers or developers. One additional employee with Curriculum Services is dedicated to the development and support of e-learning initiatives, as well as instructor technology training (A. Penner, personal communications, September, 2010). The instructors are not offered any additional time or resources to create e-learning alternatives. Despite this, some have volunteered and have worked with Curriculum Services to offer e-learning in specific courses (M. Griffin-Jenkins, personal communications, September, 2010).

In 2002, the College established the Justice Knowledge Network (JKN), an e-learning development organization specializing in online police and law enforcement training. There are
18 employees at JKN, with the majority being instructional designers and developers. While they have the expertise to create e-learning courses, JKN employees are focused on the national law enforcement market and are not often called upon to assist in the development of courses and programs specific to Holland College. The success of JKN is a testament to the foreseeable need and viability of e-learning that could be translated to specific Holland College programs (S. Sweet, personal communications, July, 2010).

The College has experienced varying degrees of success with regards to e-learning. Initiatives have been substantial, leading to fully online programs, as well as incremental, leading to enhanced classroom training. Minimum and maximum thresholds for e-learning content do not exist within the College. As such, the extent of e-learning applied to a program is highly dependent on the instructor, the availability of e-learning content, and the instructor’s definition for e-learning. Instructors in various programs use e-learning as a teaching aid for classroom sessions; however the extent, applicability, and uses of e-learning are not tracked.

The College has been most successful at adapting full-time courses to e-learning modules and programs when there is a recognized industry demand, student demand, instructor interest, or readily available e-learning content. Examples are as follows:

- **Advanced Care Paramedicine:** program was adapted to a blended format (mixture of online and in-class instruction) to meet an industry need. This course is offered primarily online supplemented with a practical in-class portion.

- **Early Childhood Development:** a blended program is in the process of being developed due to recognized need for workforce to meet government legislation changes. The course will be offered primarily online with a practical in-class portion.
• Computer Information Systems (CIS): fully online distance course was developed because of a recognized student need and instructor interest.

• Atlantic Police Academy (APA): incorporation of e-learning courses into the police cadet training program due to course availability from JKN.

The College has a rich history of supporting the community through the provision of education to create a skilled workforce. In an effort to remain responsive to the community, industry, instructors, and students, the College continually evolved and expanded program offerings. Inevitably, the College began to recognize the potential of e-learning which led to the subsequent investment in classroom technologies and the successful implementation of blended and fully online programs. The blended and online course offerings have allowed the College to expand into new markets, while the incorporation of technologies in the classroom has allowed the instructors to meet the changing needs of students. However, the College has never sought formal input from students or instructors regarding the benefits, use patterns, importance, and challenges of technologies used for learning within the College.

Statement of the Problem

After years of fragmented decisions related to e-learning, the College is focused on developing a comprehensive strategic e-learning strategy. In preparation for the development of that plan, the College must gather and analyze the relevant stakeholder input. Specifically, the College needs to understand how and why students and instructors use technologies for learning.

The specific problem is that management at the College is not equipped to develop an e-learning strategy without fully understanding the perceptions of the key stakeholders: students and instructors. By better understanding the perceptions and needs of students and instructors,
the College may then identify strategic priorities, redirect required resources, and implement
deliberate initiatives to meet organizational objectives. In an effort to hear from students and
instructors the College developed and administered an online survey.

Integrating e-learning in a classroom-based institution is challenging because of the lack
of experience, lack of expertise, limited resources, and the rapid pace at which technologies
change. The integration may be further challenged if the e-learning initiatives and technologies
are not meeting the actual needs and expectations of the students and instructors. Understanding
the perceptions of these key stakeholder groups may help the management of Holland College to
develop an innovative educational environment that meets the needs of both students and
instructors. This quantitative research will address the problems through the provision of a
descriptive analysis of the Holland College students’ and instructors’ perceptions of technologies
for learning at specific point in time. The findings will provide information from which the
management can then base decisions regarding how best to use e-learning in the future to support
students and instructors moving forward.

Purpose of the Study

The purpose of the quantitative research was to provide the management of Holland
College with information concerning student and instructor perceptions of technologies used for
learning. The results of this study may assist the management team in the development of a
comprehensive e-learning strategy that supports the needs and expectations of students and
instructors while strengthening the College’s competitive position. The study report provides a
descriptive analysis of the perceptions of technologies used and needed for learning at the
College as of December, 2010.
To fulfill the purpose, descriptive statistics were employed to provide a statistical representation of the students’ and instructors’ perceptions with regards to the benefits, use patterns, importance, and challenges of the technologies used for learning at Holland College as of December, 2010. Two additional open-ended questions were asked to explore the benefits of a technology-rich learning environment and any further challenges associated with the use of technologies for learning.

Significance of the Study

A limited amount of research exists concerning student and instructor perceptions of e-learning (National Union of Students, 2010; Palmer & Holt, 2009). Furthermore, it is difficult to evaluate and compare the literature due to varying research objectives, definitions of e-learning, and the rapidly changing technologies employed. A limited amount of publicly available research exists specifically related to students’ and instructors’ perceptions of e-learning in post-secondary institutions, and more specifically, community colleges. Finally, no research exists with respect to the perceptions of students and instructors with regards to technologies used for learning and e-learning at Holland College.

The effects of e-learning are only beginning to be realized. In order to maintain competitiveness and attract students it is important for the management of the College to understand the implications of e-learning, and to be prepared for the future where technologies may be incorporated into every aspect of education. The management of the College outlined three critical goals in an internal document entitled 2010/2011 Strategic Initiatives. Each goal had one or more objectives and subsequent strategic initiatives. One of the strategic initiatives identified was to review and update the current e-learning strategy (S. Sweet, personal
communications, July, 2010). The information from this study may be used to provide the review portion of the strategic initiative, which may in turn feed into the development of a cohesive e-learning strategy.

Nature of the Study

The nature of the study includes a description of the methodology used to answer the research questions of the study (Creswell, 2002; Fleenor & Braddy, 2009). The appropriateness of the study method and design is discussed in this section. The following section also contains a summary of study population and sample, instrumentation used for data collection, and the data analysis process.

Appropriateness of the Method and Design

Quantitative, qualitative, and mixed methods are the three different types of research employed (Neuman, 2006; Reid & Mason, 2008). Creswell (2002) and Kilmoski (2009) reiterated that quantitative research is used when seeking to describe a situation or determine what people think or feel. Qualitative research is exploratory, as the researcher seeks a deeper understanding of why people think or feel a certain way rather than merely explaining what they think or feel (Ben-Zvi & Garfield, 2008; Shield & Twycross, 2003). Mixed method research incorporates both quantitative and qualitative research (Cheung, 2009).

A quantitative approach was selected for the study as the main study focus was to describe the perceptions of the Holland College students and instructors. The data provided by Holland College was in survey form that fit a quantitative approach. Due to the limited amount of time and resources allocated to this particular study, the quantitative approach allowed for a
quick and convenient manner to gather, select, and analyze the data in order to address the research questions.

*Population and Sample*

The research entailed the collection of data from two populations. The first population consisted of the students at Holland College. As of December 2010, there were 2925 students enrolled in the programs offered at Holland College campuses across Prince Edward Island. Full-time and part-time post-secondary students included 1997 individuals, while 578 students were enrolled in Adult Education & GED (General Equivalency Diploma), and 350 students were enrolled in Language Training. The second population consisted of 385 instructors teaching at Holland College as of December, 2010.

A sample is a segment of the population selected to represent the larger population (Onwuegbuzie & Leech, 2005). The surveys were administered under a census approach and sent to the entire student and instructor populations. Therefore, the study samples consisted of those students and instructors who voluntarily participated in the electronic surveys. The study sample consisted of 533 students and 109 instructors from Holland College.

*Instrumentation*

The study sought to address new research questions by reexamining existing data collected by Holland College (Fleenor & Braddy, 2009; Neuman, 2006). The secondary data about students’ and instructors’ perceptions and demographic characteristics was made available from Holland College through a secure password protected computer network area on the learning management system, SAM. The data was originally collected by a Holland College representative through self-complete electronic surveys. Prior to the release of the data, a non-disclosure agreement (Appendix A) was signed and permission was granted by officials at the
College to use secondary data from the surveys as a means of responding to the research questions posed in this study.

The survey was based on the CDW-G Campus Assessment Tool (Appendix B). The CDW-G is a leading provider of technology products and services for business, government and education (CDW-G, 2010). Similar to the CDW-G organization, Holland College expected to use the assessment tool as a means to better understand the perceptions of students and instructors with regards to technologies for learning. Researchers within the College revised the survey instrument to ensure applicability to Holland College students and instructors. Copies of the final Holland College surveys are provided in Appendix C.

*Data Collection and Analysis*

The data was collected by a Holland College representative through self-complete electronic surveys and provided as secondary data for the purposes of this study. In December of 2010, all Holland College students and instructors received invitations to participate in the surveys via Holland College email accounts. The invitation included notification of the voluntary status and confidentiality of the surveys. A description of the research, including the purpose, objectives, and reporting of the results was provided. The respondents who voluntarily participated in the study purposely agreed to the terms outlined in the invitation. The terms of participation were further reiterated in the introduction to the surveys.

The surveys entailed the collection of data about student and instructor perceptions of e-learning and technology. The survey questions and responses were reviewed and those that best captured essential data for each specific research question asked in this study were selected for further analysis. Summations, averages, percentages, and frequencies of the students’ and
instructors’ perceptions allowed for a summary of the results and subsequent interpretations. With a theme analysis conducted on the open-ended questions.

Research Questions

Creswell (2002) stated research questions are those questions a study tries to address. Research questions are specific and focused in order to refine the general topic, problem, and purpose of the study (Kilmoski, 2009; Neuman, 2006). This research sought to answer the following research questions (RQs):

RQ1. From the perspectives of students and instructors at Holland College, what are the benefits of a technology-rich learning environment?

RQ2. From the perspectives of students and instructors at Holland College, how is technology used in the learning environment?

RQ3. From the perspective of students and instructors at Holland College, how important are certain technologies to the learning environment?

RQ4. From the perspective of students and instructors, what are the biggest challenges with respect to technologies for learning and teaching at Holland College?

Assumptions

Assumptions are the underlying elements that researchers assume to be true for the purposes of a study (Creswell, 2002, Onwegbuzie & Leech, 2005, Smart, 2005). Assumptions ensure a general consideration of the premises of the research, which guide the framework for the study. The assumptions associated with this research are as follows:

- The survey tool used to gather the primary data generated relevant data to answer the research questions specific to this study.
• All students and instructors of the College could easily access the survey and could understand the questions, allowing for an equal opportunity to participate.

• Students and instructors, who completed the surveys, accurately represented the general populations at Holland College.

• The instructors could speculate on student perceptions of e-learning because they receive feedback from students on a regular basis.

• The data collected by Holland College researchers was free of errors and biases.

• The data collection process entailed unbiased methods, analysis processes, and ethical practices on the part of the investigator.

Organization of the Thesis

The study is organized into 5 Chapters. Chapter 1 provided an introduction to the overall study, including the background, introduction to the problem, purpose of the study, and the research methodology. A comprehensive overview of the existing literature related to the study is provided in Chapter 2. Specifically, Chapter 2 contains a synopsis of the evolution of e-learning, with a detailed analysis of e-learning specific to post-secondary institutions. A description of the research methodology, including the data collection and data analysis is presented in Chapter 3. Chapter 4 describes the findings elicited through the application of the methods to answer the specified research questions. The final Chapter, Chapter 5, provides a discussion of the results and summary of the research findings, including recommendations for the management of Holland College.

Chapter 1 acknowledged the effect technology has imparted on education, causing changes to the learning environment on a global level. Holland College management is conscious
of the changing environment and the importance of responding appropriately to best meet the needs of students and instructors. However, it is difficult to respond appropriately to those needs, as the College has never taken the time to ask for students’ and instructors’ input in regards to technologies used for learning. To better understand the situation and the importance of students’ and instructors’ feedback on e-learning and technology an in-depth review of the literature was conducted and is summarized in Chapter 2.
CHAPTER 2: LITERATURE REVIEW

The literature review provides an account of the published academic research on the broad topic e-learning and more specific topics concerning e-learning in post-secondary educational institutions, the benefits, the challenges, and the key stakeholders. The context of the research is described in the first section, which includes the evolution of technologies for learning, the definition of e-learning and possible synonyms, and an explanation of the dimensions of e-learning. The second section of the literature review delves into a detailed analysis of e-learning in post-secondary institutions, including the trends and growth, benefits and challenges, and the key stakeholder groups involved in e-learning. The literature review concludes with the identification of the gaps in the current research and trends that provides the basis for conducting this research.

Several academic databases and professional organization publications provided relevant literature for the literature search process. Database sources included the following: Academic Source Premier, Business Source Premier, and ERIC. Internet searches via Google were conducted to generate further scholarly articles as well as additional substantive and popular articles pertaining to e-learning.

Evolution of Technologies Used for Learning

Since the beginning of time, humans have passed on knowledge through observation and imitation (Porqueras & Rodriques-Neto, 2010). As societies evolved, education became a formal process where students were in direct contact with instructors (teachers) in classroom settings. However, due to the introduction of computer technologies, the media and methods used in
formal education have evolved (Organisation for Economic Co-operation & Development (OECD), 2003).

Dating as far back as the early 1960s, educators experimented with computers for teaching and learning (Cross, 2004). By the late 1980s, computer based training was being used to provide training aimed to replicated traditional teaching. The majority of computer based training was administered in traditional classroom settings or as part of distance education programs by compact disc (CD-ROM). Information Technology (IT) corporations as well as post-secondary institutions that specialized in distance education were the quickest to adopt computer based training as it allowed for timely, cost effective training that was controlled by the learner (Cross, 2004). However, as noted by Cross, computer based training was not without its limitations, as learners often found the experience boring, un-engaging, and dropout rates were high.

In the late 1990s, with the introduction of the World Wide Web, the term e-learning was coined (Cross, 2004). Defined as Internet enabled learning, e-learning was touted for converging learning and networks. While the early forms of e-learning had many of the same limitations as computer based training, leaders in the field noted e-learning was a means of eliminating the barriers of time and distance, creating universal learning-on-demand opportunities for people, companies, and countries (Williams & Goldberg, 2005). By the early 2000s, many speculated that e-learning would have a profound effect on the education industry (OECD, 2003; Young, 2006). Yet, ten years later, and the effects of e-learning appear to be minimal (Marshall, 2010). While this may be the case, evidence exists to suggest a period of sustainable growth for e-learning is on the horizon.
Increased personal and professional applications of technologies are creating a demand for educational institutions to follow suit. Coupled with improved technologies (i.e., bandwidth, Internet access), and pedagogical skills of educators, it appears inevitable that the benefits of e-learning will finally be realized (Canadian Council on Learning, 2009; Marshall, 2010; Williams & Goldberg, 2005). However, just as technology continually evolves at an ever increasing pace, so too, will e-learning (OECD, 2008). The constant evolution means educators must keep a watchful eye on e-learning, including the changing definitions, synonyms, and various technologies used for learning.

E-learning

Definitions, Technologies, and Synonyms

E-learning has become an all-encompassing catch-phrase for the application of technologies or electronics to education (Fournier, 2008). While varying definitions exist in the literature (Wagner et al., 2008), for the purposes of this research e-learning is broadly described as instructional content delivered or enabled by electronic (computer) technologies (Canadian Council on Learning, 2009; Ong, Lai, & Wang, 2004). Under this broad view, e-learning can take place anytime, anywhere. E-learning can be formal, informal, or a combination of both. Internet, intranets/extranets, or learning management systems can be used to support e-learning, while email, social media, webinars, audio/videoconferencing, and podcasts can be used to share the content. A variety of information and communication technologies (ICTs) that include, but are not limited to: personal computers, mobile devices (i.e., cellphones/Smartphones, Ipads, Netbooks), and interactive multimedia, such as data projectors and interactive whiteboards (i.e., Smartboards) can be used for e-learning. However, in order for e-learning to be successful there
is a requirements for installed computers (home, workplace, school), network security, infrastructure and suitable bandwidth, cheap and reliable access to the Internet, and user acceptance (Kastelic & Loncaric, 2007).

The term e-learning is often used synonymously with such terms as: technology enhanced learning, virtual learning, online learning, computer enhanced learning, and web based learning, however each of these terms can have a slightly different definition depending on the research and the context (Canadian Council on Learning, 2009; Naidu, 2006). Distance learning is often used interchangeably with e-learning as the Internet is one of the most common means of providing distance education. However, distance education is described as a process to create and provide access to learning when the source of information and the learners are separated by time and distance, or both (Honeyman & Miller, 1993), which differs from the definition of e-learning.

Distributed learning is also often used synonymously with e-learning and distance learning; however, distributed learning is described as an instructional model that allows instructor, students, and content to be located in different, non-centralized locations so that instruction and learning are independent of time and place (Saltzberg & Polyson, 1995). A recently coined synonym is the term e-learning 2.0, created to complement the term Web 2.0 (Millard & Essex, 2007). Furthermore, some researchers suggest the term should be e-education, so as to account for both the experience of students and instructors (Kastelic & Loncaric, 2007), while others prefer to use the term mobile learning (m-learning) so as to complement the further development and use of mobile ICTs in learning (Canadian Council on Learning, 2009). Many definitions, terms, and modes of delivery exist for e-learning. Despite this, the fact remains, technology is having an impact on learning. And those educational
institutions that acknowledge the impact of e-learning will likely be in a better position moving forward.

Dimensions of E-learning

The extent of e-learning technologies used in course delivery can be characterized by a number of attributes, or dimensions (Wagner et al., 2008). The mode of delivery can vary, as e-learning can be offered on an electronic only (fully online) basis which replaces face-to-face instruction or can be used to enhance classroom training through varying degrees. Allen and Seaman (2010) defined online courses as those in which at least 80 percent of the course content was delivered online. Face-to-face instruction was categorized as courses where zero to 29 percent of the content was delivered online; this included web facilitated courses that used web-based technology to facilitate what is essentially a face-to-face course. In this type of course, a learning management system (LMS), course management system (CMS), or web page may be used to post the syllabus and assignments. The remaining alternative, blended (often referred to as hybrid or mixed mode) instruction is defined as having between 30 percent and 80 percent of the course content delivered online (Allen & Seaman, 2010). In blended approaches there is usually a reduction of classroom training as a substantial proportion of the content is delivered online and students typically partake in online discussions.

E-learning can be synchronous or asynchronous. Synchronous requires simultaneous participation of all learners and instructors at different locations, while asynchronous does not require simultaneous participation (Zhang, 2003). Location offers another dimension as e-learning can take place at the same location or via distance learning (Carpenter, 2010). The type of interaction poses a further dimension for e-learning as it can be collaborative or individualized
(Abrami et al., 2006). The dimensions of e-learning, while insightful, add yet another layer of complexity to an already obscurely defined tool and pedagogy.

**Learner Interaction**

Augmented learning occurs when a learner interacts with the e-learning environment. By adapting to the needs of individuals, the context-driven instruction can be dynamically tailored to the learner's natural environment (Allen & Seaman, 2006). By personalizing instruction, augmented learning has been shown to improve learning performance for a lifetime. Different learning experiences occur that can be classified in terms of the amount of control that the student has over the content and nature of the learning activity. Examples of the different learning experiences in e-learning are as follows:

- **Expository instruction** - digital devices transmit knowledge;

- **Active learning** - the learner builds knowledge through inquiry-based manipulation of digital artifacts such as online drills, simulations, games, or microworlds; and

- **Interactive learning** - the learner builds knowledge through inquiry-based collaborative interaction with other learners; teachers become co-learners and act as facilitators (Center for Technology in Learning, 2009).

E-learning allows for greater learner control, creating a shift from classrooms that are teacher-centric to classrooms that are learner-centric (Berge, 2002). Education is no longer about teachers and teaching. The ‘sage on the stage’ is giving way to the ‘guide on the side’ (Williams & Goldberg, 2005) as societal forces now demand that the focus be on learners and learning (Buzzetto-More, 2008).
Post-Secondary Institutions & E-learning

Research conducted in 2004 concerning the implementation of e-learning in post-secondary institutions in the United States led to the description of e-learning as a ‘thwarted innovation’ (Zemsky & Massy, 2004). Similarly, Latchem, Jung, Aoki, and Ozkul (2007) concluded that the e-learning integration in Japanese higher education advanced at the speed of a tortoise. In a more recent study conducted in 2010, Schneckenberg observed that e-learning was not often an institutional priority, which led to disappointing integration of e-learning in post-secondary institutions from both strategic and learning perspectives.

Despite the apparent issues surrounding the uptake and integration of e-learning, the growth in the use of e-learning is expected to rise at an ever increasing pace over the next several years (Buzzetto-More, 2008; Canadian Council on Learning, 2009; Marshall, 2010). E-learning growth will occur in response to the global shift towards knowledge based economies where people are continuing the learning process throughout their lives (Carpenter, 2010). Learning has become the most indispensible activity in the knowledge-based economy (Zhang, 2003), with learners taking advantage of the Internet and the ability to access education locally, nationally, or internationally, and at anytime, anywhere (Canadian Council on Learning, 2009).

Rising costs, shrinking budgets, and increasing needs for distance education (Johnson, Levine, & Smith, 2007) are causing educational institutions to reexamine e-learning. In response to the changing environment, e-learning is being implemented more frequently creating new and exciting opportunities for institutions, instructors, and students (Wagner et al., 2008). E-learning is believed to be the fastest growing sub-sector of the global education market, with the market for online higher education expected to grow to $69 billion USD by 2015 (Hezel Associates, 2005).
Recent research conducted in the US by the Sloan Commission (Allen & Seaman, 2010) provided further support for the growth of e-learning. In 2009, reports showed that, 5.6 million post-secondary students in the United States had taken at least one online course, representing a twenty-one percent increase over 2008, which translated into a nineteen percent compounded annual growth rate since the inception of the survey in 2002. For comparison purposes, the overall higher education student body in the US has grown at an annual growth rate of less than two percent during the same period (Allen & Seaman, 2010).

Within Canada, similar growth trends have been realized by major online distance education providers. For example, from 2002-2008 enrollments doubled at Athabasca University, an online distance education provider in Alberta. During the same time frame, enrollments at the online distance university of Quebec in Montreal (La Télé-université (TÉLUQ) increased by thirty-five percent (Canadian Council on Learning, 2009). The Canadian Virtual University, a group of Canadian universities specializing in online and distance education, offering over 300 degrees, diplomas or certificates has estimated a 10% per year increase since 2000 (Canadian Council on Learning 2009).

The implementation of e-learning varies significantly among post-secondary education providers (Smith, Borreson Caruso, & Kim, 2010). As noted in the research by Parker & Martin (2010), the delivery methods of e-learning can range from asynchronous text-based forums for discussion and questions, written assignments submitted online, synchronous text-based and real-time lectures or discussions, exams submitted online, lecture notes posted online, PowerPoint presentations available online or for downloading, and written projects submitted via email. The ICTs needed for e-learning to take place can vary widely as well, from desktop and portable computers and mobile devices to digital projectors, interactive whiteboards, and
learning management systems (Kastelic & Loncaric, 2007). The learning management system has become one of the most widely used educational technology tool used by education providers (Palmer & Holt, 2010). While technologies for learning are becoming increasingly popular (Parker & Martin, 2010), the appropriateness of the technology varies significantly from course to course (National Union of Students, 2010).

The amount of e-learning offered at the post-secondary level continues to vary across the different disciplines as well as institutions. Studies indicate that e-learning is most widely used for Business/Management and IT/Computer Sciences programs. In Canada, education and humanities programs also had a significant online presence (Canadian Council on Learning, 2009; OECD, 2008).

While the technologies employed for e-learning vary, the research conducted by (Salaway, Borreson Caruso, & Nelson, 2008) revealed that most students in the US are enthusiastic users of ICTs, even though the majority (59 percent) preferred courses that included only a moderate amount of technology. Over half of the students enjoyed learning from programs that allowed for learner control, such as simulations and video games. Furthermore, over 35 percent enjoyed learning through content contributions to websites, blogs and wikis. Both younger and older students had preferences for e-learning, however the findings on mandatory online training were mixed with 23 percent of students thought it would be good if they were required to take an online course, 23 percent disagreed, and 23 percent strongly disagreed (Salaway et al., 2008). Research has shown that students tend to see more value in a learning management system for enhancing learning than instructors (Palmer & Holt, 2010). While the research conducted by the National Union of Students (2010) revealed that students
still have a preference for face-to-face, even though most students want ICT’s integrated into the curriculum.

Benefits of E-learning for Institutions, Instructors, and Students

The benefits of e-learning have been experienced at the institution, instructor, and student level. While multiple benefits of e-learning have been cited in the literature, in the recent research conducted by the Canadian Council on Learning (2009), the following benefits of e-learning were identified:

- Better academic achievement and higher motivation for and satisfaction with the learning process;
- Increased communication and collaboration among all participants in the educational process and global access to resources and teaching;
- Decreased direct and indirect costs of formal education (including reductions in the dropout rate);
- More flexible and accessible learning environments and learning that can take place anywhere, at any time;
- Increased ability to meet social demands, such as the need for creating professionals who are literate in modern informational technologies and well prepared for the ICT challenges of the global economy; and
- Facilitated learning opportunities for students in rural and remote areas, and students with disabilities.

In congruence with these findings, the research conducted by Young (2006) reported that flexibility was one of the most cited advantages of e-learning according to both students and teachers. Beyond this, many learners embraced e-learning because of the decreased cost,
personalized learning aspect, learner sovereignty (Williams & Goldberg, 2005), and just-in-time (or learning-on-demand) capabilities (Zhang, 2003). Additionally, interviews with distance learners who were not technologically adept reported gaining both subject and technology knowledge through e-learning (Haythornwaite, 2006). The benefits at the institution level are comprised of the ability to expand into new markets via a range of distributed locations, including on campus, home and other community learning or resource centers. And the potential to decrease the costs associated with e-learning (Naidu, 2006).

Challenges For Institutions, Instructors, and Students

The adoption of e-learning can be explained through the established innovation adoption models of Rogers (2003) and Moore (1999). The research recognizes that adoption is gradual and goes through a continuum of phases consisting of: innovators, early adopters, late adopters, and laggards (Berge, 2002; Bowers, Ragas, & Neely, 2009). Both individuals and organizations fall under the appropriate phase depending on how quickly adoption occurs. The varying phases of adoption, when considered and managed appropriately, have been shown to improve the overall uptake of technology adoption, including e-learning (Hart & Christensen, 2002). However, in the works of Naidu (2006) the fundamental obstacle to the growth of e-learning was identified as a lack of access to the necessary technology infrastructure, for without it there can be no e-learning. The research goes on to show that poor or insufficient technology infrastructure also creates a barrier, as it can lead to unpleasant experiences causing more damage than good to instructors, students and the learning experience (Naidu, 2006).

Researchers have observed that the adoption of e-learning among post-secondary institutions has been slower than anticipated (Canadian Council on Learning, 2009). Research conducted by Marshall (2010) revealed challenges were posed by early technological limitations,
organizational implementation failures, and the resistance to change from traditionalists. The adoption appeared to be further hindered by fears of technology constraints, risks associated with investing in new untried technologies, and failures to see the increasing demand for e-learning at an organizational level (Marshall, 2010).

Driscoll (2008) observed a lack of research concerning the causes of failures for e-learning programs and courses. Upon compilation of the reports, the causes of the failures appeared to fall under one of four themes:

- Organizational barriers, in which an organization did not properly prepare for, nor support its own e-learning effort(s) from a resource perspective;
- Pedagogical problems, in which the e-learning programs did not achieve the intended results;
- Technical problems, in which the technology selected did not address the real needs or resulted in some other unanticipated difficulty; and/or
- Financial problems, in which the e-learning project was under-funded and therefore could not produce the anticipated gains (Driscoll, 2008).

Another challenge was observed when e-learning produced learning outcomes that were only equivalent to (not better than) those obtained from classroom instruction. In such cases, e-learning was often considered a waste of time and money because it did not improve student outcomes (Center for Technology in Learning, 2009). Furthermore, the extent in which the types of technologies used for learning vary across the different disciplines caused another challenge to e-learning adoption and integration (National Union of Students, 2010). Due to the varying degrees that e-learning can enhance a particular discipline, difficulties arise in the implementation of a ‘one size fits all’ e-learning approach (Schneckenberg, 2010).
One of the major concerns of institutional leaders and instructors alike when offering e-learning in conjunction with face-to-face training is that students don’t have the same incentive to attend class (Porqueras & Rodriques-Neto, 2010). However, the research showed that not all technologies had an equal impact on attendance. There appeared to be a limited effect on attendance if the e-learning complemented, rather than substituted, live lectures. Likewise, if e-learning was a relatively good substitute and relatively poor complement for class, then attendance decreased with the degree of access students had to the materials.

Additional concerns expressed by students included: privacy issues, the use of technology ‘just for technology’s sake’, and instructor technology capability (National Union of Students, 2010). Low instructor technology capability (i.e., e-competence/e-literacy) has been observed as a precursor to increased resistance from instructors to change teaching methods (Schneckenberg, 2010). Furthermore, instructors are often asked to use technologies without the adequate understanding, support, and professional development (Canadian Council on Learning, 2009; National Union of Students, 2010).

E-learning initiatives can be short lived, as the sustainability is challenged by the quick pace of technology change (Marshall, 2010). Technology development tends to outpace strategic thinking and pedagogical design in post-secondary institutions, making it difficult to implement sustainable e-learning initiatives (Schneckenberg, 2010). The perpetual change in technologies is anticipated to continue at an ever increasing pace. Collins and Halverson (2010) contended that educators should remain focused on education and changing pedagogies, not just the changing tools and technologies. Furthermore, the research suggests that institutions would experience better integration and adoption of e-learning at all levels if the management took the time to
better understanding the unique needs of the various stakeholders affected by e-learning (Wagner, et al., 2008).

Key Stakeholders

As per the research of Wagner et al. (2008), the successful implementation of e-learning was identified as being dependent on the extent to which the needs and concerns of the stakeholder groups involved were addressed. The stakeholders groups defined in the research were those that were affected by e-learning. Stakeholders included students, instructors, institutions, content and technology providers, accreditation bodies, and employers. Using e-learning effectively can address the varying interests, motivations, concerns, and demands of each stakeholder group. Furthermore, each stakeholder group has an important role to play in enhancing the overall learning experience (Wagner et al., 2008).

Students and instructors are required to participate as proactively as possible in e-learning initiatives. The expectation is that students and instructors will provide feedback to improve future experiences. The institution is expected to provide the technical infrastructure and support to enable comprehensive solutions. The content and technology provider should provide high-quality, practical solutions that consider learning principles. The accreditation body must provide and enforce clear guidelines for the new form of learning delivery. Finally, the employer must recognize the validity of e-learning and work with other stakeholders to ensure that graduates’ skills meet the needs of the job market (Wagner, et al, 2008).

The importance of stakeholders was further supported in a 2006 report on project barriers and success factors of a large-scale e-learning project (Learn@WU) at the Vienna University of
Economics and Business Administration (Canadian Council on Learning, 2009). One of the key conclusions was that continuous stakeholder alignment was critical to the success of e-learning.

**Institutional Level**

Many aspects of an institution can drive the acceptance and integration of innovations, such as e-learning, including, but not limited to, the management style, organizational champions, the work environment, the level of employee engagement, and professional development opportunities (Canadian Council on Learning, 2009). As noted by Marshall (2010), post-secondary institutions require leadership, guidance and vision to implement long term sustainable e-learning strategies that deliver value to students. Furthermore, robust processes to design, deploy, and sustain e-learning are superior to unstructured programs and dependencies on particular individuals (Marshall, 2010). At the institutional level a whole set of activities needs to be considered. Activities can range from setting goals to establishing institutional incentives, to defining roles and responsibilities, to actively engaging stakeholders, and to moderating the learning processes (Schneckberg, 2010).

**Instructor Level**

Instructors are the primary providers of learning and e-learning in most educational environments (Wagner, et al., 2008). As the ‘gatekeepers’, instructors define the curricula and the methods of deliver for learning materials (Schneckenberg, 2010). To meet the changing needs of technology-savvy students, instructors are faced with the pedagogical challenge of integrating information and communication technologies into courses. As noted by Wagner et al. (2008) understanding the needs and expectations as well as the inter-relations of instructors with other stakeholders is a key to the successful implementation of e-learning.
**Student Level**

As the primary consumers of education, students are the biggest influencers of the adoption and implementation of e-learning within institutions (Schneckenberg, 2010). Students are becoming increasingly more familiar with information and communication technologies (ICTs). Many young students have been exposed to technology throughout their lives while adult learners are using technologies in their daily work and personal lives (Haythornthwaite, 2006). The increased exposure and acceptance of technology is leading to an increase in demand for educational technologies by students (Smith et al., 2010). Students are pushing educational institutions to incorporate familiar technologies or the technologies anticipated to be used in varying career paths. E-learning is a determinant of the future uses of technologies for learning but also a driver of the potential priority skills needed by students for future work and life skills. For example emphasizing distributed, computer mediated teamwork and communication over more traditional formal speaking and writing skills (Haythornwaite, 2006).

**Gaps and Future Research**

To help institutional leaders assess e-learning capability within an organization, Marshall (2010) recommended the use of an e-learning maturity model. Marshall argued that the model is useful in providing a road map for post-secondary institutions looking to evaluate and improve e-learning processes. While this model is helpful for analyzing the e-learning environment from the management perspective little consideration is given to the importance of feedback from the other key stakeholder groups, including instructors and students. Prior to the use of a framework, an analysis of the key stakeholders could provide insight into the expectations, use patterns, and limitations posed by the existing programs. Further research into the application of key
stakeholder feedback into the evaluation frameworks would be of benefit to institutional managers and strategy makers.

The research specific to post-secondary institutions within Canada is limited as difficulties arise in the identification of e-learning availability within post-secondary institutions. A database of e-learning courses and materials available across Canada at both the college and university level could prove to be beneficial to educators and leaders from a collaboration standpoint. The research and availability of such a database could also benefit students from an educational selection process standpoint.

The research concerning the key stakeholder groups and the affect these groups have on the success of e-learning initiatives within post-secondary institutions appears to be limited. Another consideration is the varying roles an institution can play as a key stakeholder. Further research into how the roles of students, instructors, and the institution interrelate within an e-learning environment is required. Another area relatively devoid of research pertains to student and instructor evaluations of e-learning in predominantly face-to-face post-secondary institutions. One possible rationale for this gap might be explained due to the fast pace of technology change. As such, the data quickly loses relevance (National Union of Students, 2010). Another possible cause of the limited availability of research may be due to the fact that many institutions conduct research internally and do not publish the results. However, even if such research were available, due to the diverse socioeconomics of institutions the feedback obtained from the key stakeholders associated with one institution that would likely not apply to another.

The 2010 Horizon Report (Johnson, Levine, Smith, & Stone, 2010) is a qualitative research project that identifies and describes emerging technologies likely to have a large impact
on teaching and learning in post-secondary institutions within the next five years. The report suggested that mobile computing and open content would have a significant impact on post-secondary institutions within the next 12 months, with electronic textbooks and simple augmented reality expected to emerge within 2-3 years. The research provides definitions and suggests that educators should consider these technologies in curricula development. Although, it does not state whether the adoption of these technologies for learning will be consistent across all post-secondary institutions in both the US and Canada. Further research specific to technology requirements of students and instructors in distinct areas and regions and how these variables will impact the potential uptake of technologies for learning is required. Due to the fast pace of technological change it is difficult to predict what students and instructors will need, let alone understand how students and instructors are currently using technology for their learning. Therefore, a continuous evaluation process to gauge the perceptions and understand the needs and expectations of instructors and students would prove beneficial to educational institutions at all levels.

Summary

Growth of e-learning and technologies used for learning is inevitable, especially in post-secondary educational institutions (Marshall, 2010). However, the ability for organizations to successfully implement e-learning will vary and is dependent on the interrelationships of the key stakeholders (Wagner et al., 2008). The perceptions of the key stakeholders provide information that is useful for organizations in the development of e-learning strategies. The organizations that take the time to proactively engage the students and instructors may gain a clearer picture of their needs and expectations with regards to e-learning in the near term and into the future. Chapter 2
provided the overall research landscape in which this study exists. The next Chapter outlines the research methodology that provides the framework of the study.
CHAPTER 3: METHODOLOGY

The methodology section describes how the data was collected and analyzed in order to answer the specific research questions associated with this study. The purpose of this quantitative research was to provide the management at Holland College with information concerning student and instructor perceptions of technologies used for learning. The information might provide the management of Holland College with a more comprehensive understanding of the perceptions of students and instructors. Management might then be in a position to use the additional data to help guide the development of a robust e-learning strategy that could meet the needs of students and instructors. Chapter 3 includes a description of the research methodology, appropriateness of the design, research questions, population, sample frame, research ethics and confidentiality, data collection, and the data analysis methods.

A quantitative approach to the data analysis was selected even though the surveys generated both objective and subjective data. The objective data, obtained from close-ended survey questions, allowed for a descriptive statistical analysis and explanation of perceptions as of December 2010. The findings were further substantiated with a minimal amount of subjective data in the form of open-ended survey questions. These additional questions allowed for the exploration and interpretation of themes identified by the respondent groups; however the results were reported in numerical form. The quantitative approach with a small amount of qualitative type data was selected, as it provided for a cost effective, timely, and multi-dimensional interpretation of e-learning and technology use at Holland College.
Research Methodology

Research designs can be experimental, exploratory, descriptive, and causal. Each research design is used to address certain types of research (Kilmoski, 2009). This study incorporates a descriptive design to address the research questions through quantitative analysis. The primary purpose was to provide a descriptive analysis of the perceptions of students and instructors with regards to e-learning and technologies used for learning at a specific point in time.

The quantitative research focused on objective data and the application of statistical analysis to derive measures that informed the field of study (Sheilds & Twycross, 2003; Vogt, 2007). Through a series of categorical and Likert scale survey questions, the quantitative data allowed for a descriptive statistical analysis of the students’ and instructors’ perceptions of technology and e-learning at a particular point in time.

Traditionally, surveys are used to generate quantitative data. However, due to time and resource constraints, two open-ended questions from each survey were analyzed to generate subjective data. In most cases the responses consisted of short sentences and brief comments, not as rich in content as qualitative data obtained from interviews or focus groups (Creswell & Plano Clark, 2007). Due to the limited amount of qualitative type data, the research was not considered mixed methods.

Appropriateness of Design

Quantitative methods are used by researchers to measure variables, describe trends, and make predictions and generalizations about a phenomenon (Ben-Zvi & Garfield, 2008). The data used for this study was derived from secondary quantitative survey data. Therefore the methods were selected as a means to extrapolate meaningful information from the data. The descriptive
purpose fit with the quantitative approach. As there was a limited amount of time and resources allocated to this particular study, a quantitative approach was used as a quick and convenient manner for selecting and analyzing the secondary data in order to address the research questions (Hair, Babin, Money, & Samouel, 2003).

Research Questions

Research questions (RQs) openly state what questions a researcher intends to address (Creswell, 2002; Kilmoski, 2009). In this study, the purpose was to determine the perceptions of students and instructors with regards to technologies for learning and e-learning at Holland College. The research was conducted to answer the following specific research questions:

RQ1. From the perspectives of students and instructors at Holland College, what are the benefits of a technology-rich learning environment?

RQ2. From the perspectives of students and instructors at Holland College, how is technology used in the learning environment?

RQ3. From the perspective of students and instructors at Holland College, how important are certain technologies to the learning environment?

RQ4. From the perspective of students and instructors, what are the biggest challenges with respect to technologies for learning and teaching at Holland College?

Population

A population is the collective sum of units being studied (Fleenor & Braddy, 2009). The first population for the study included students enrolled at Holland College as of December 2010. The second population included instructors employed at Holland College as of December 2010. The following sections describe the student and instructor populations in more detail.
Student Population

In December 2010, 2925 students were enrolled at Holland College. Students were enrolled in one of the following areas, or sub-populations: 1) Full-time and Part-time Post-Secondary Programs 2) Adult Education & General Equivalency Diploma (GED); and 3) Language Training. Full-time and Part-time post-secondary programs included: Bachelor of Education Degree/Certificate in Education, College Foundation, The Culinary Institute of Canada, Health & Community Studies, Marine Training, Media & Communications, Atlantic Police Academy, Tourism & Travel Program, Trades & Industrial Technology, Business studies, and Computer studies.

The full-time and part-time post-secondary programs consisted of 1997 students, while 578 students were enrolled in adult education and GED programs, and 350 students were enrolled in language training. The breakdown of students by program can be found in Appendix D. Gender data reported by the College showed that the overall student population consisted of 45 percent males and 55 percent females (T. Antoniak, M. Josey, D. Maclaasc, personal communications, January, 2010).

The data pertaining to year of study and age was only available for the post-secondary students due to the varying timelines in Adult education & GED and Language training, coupled with the continuous inputs and outputs of students. The post-secondary student population consisted of 74 percent enrolled in first year, 23 percent enrolled in second year, and three percent enrolled in third or fourth year. The students ranged in age from under 20 to over 50. Forty-five percent of students were 20 and under, 26 percent were between the ages of 21 to 24, 17 percent were between the ages of 25 to 34, 10 percent were between the ages of 35 to 49, and two percent were 50 and over (T. Antoniak, personal communications, January, 2010).
Instructor Population

The instructor population included 385 instructors working at Holland College as of December 2010. The instructors ranged in age from 20 years of age to over 60 years of age. Fifteen percent of instructors were between the ages of 20 to 34 years of age. While 29 percent were between the ages of 35 to 44 years of age. The largest instructor group was between the ages of 45 to 54, accounting for 30 percent of instructor respondents. Finally, 25 percent were 55 years and older. Of the 109 respondents, 55 percent were female and 45 percent were male (L.Perrin, personal communications, February, 2010). The breakdown of instructors by program can be found in Appendix D.

Sample Frame

A sample specific to the research was not defined. The primary research data was gathered under a census model, whereby all the individuals in both the student and instructor populations were invited to participate. The census model was chosen as an all-inclusive approach to maximize the feedback from both populations and increase the degree of statistical confidence. Based on past survey results, the Holland College researchers expected a 20-30 percent response rate. The study sample included the students and instructors who agreed to participate in the survey.

Student Sample

A Holland College representative provided existing data for a sample of 533 students. The data included both demographic data and students’ perceptions of technologies for learning at Holland College. A sample of 533 students represented 18 percent of the general student
population, slightly lower than the anticipated response rate of between 20-30 percent. However, student representation from each program of study was achieved.

*Instructor Sample*

Data pertaining to 109 instructors was provided by a Holland College representative. The data included instructors’ demographic data and perceptions of technologies for learning at Holland College. Instructor respondents represented approximately 28 percent of the total instructor population. The response rate was between the 20-30 percent range expected by the Holland College researchers.

*Research Ethics & Confidentiality*

As the research involved the selection and analysis of secondary data supplied by Holland College, an application to the University of Prince Edward Island to conduct research involving human subjects specifically for this research project was not required. However, prior to the collection of the primary data the Holland College researchers applied for and received approval from the Holland College Research Ethics Board to conduct research involving human subjects. Prior to releasing the raw data to the researcher conducting this study, authorities of Holland College developed a nondisclosure agreement that stipulated the terms and conditions of involvement by the researcher, specifications for use of the data, and confidentiality and privacy protection of participants and Holland College.

A Holland College representative stored the combined secondary data in Holland College’s learning management system, SAM. The data was only accessible to the Holland College researchers. The researcher associated with this study was provided limited-time access to the data via a secure password protected learning object repository available on SAM. After
the data was analyzed the researcher’s accessibility to the data on SAM was deleted. The results from the surveys were reported in aggregate at a cohort level for both students and instructors.

Data Collection

Although the data used for the purposes of this study was secondary, understanding how the data was originally collected by Holland College is important to the study methodology. The College originally collected the data on behalf of the IT Committee for research outside the scope of this study. The College collected the primary data in the manner outlined in the following sections.

Invitation to Participate

An email invitation was sent on December 7, 2010 from a Holland College representative to all students’ and instructors’ Holland College email accounts. Both groups were expected to access their Holland College email accounts on a fairly regular basis. Thus, an email was determined by the researchers at the College as the best means to quickly contact everyone in the two populations. Instructors were also asked in the email from the Holland College representative to notify students and encourage participation. In an effort to increase response rates, and tying in with the holiday season, three Ipod Touches were offered in a draw for student participants and one Ipad tablet was offered in a draw for the instructors. More prizes were offered to the students because of the larger population size.

The electronic invitation explained the purpose of the study, confidentiality and voluntary status. Directions for accessing the surveys through a link provided in the email were provided. The instructors were also asked to encourage student participation. Students and instructors were notified of the voluntary prize draws and the survey close date of December 17, 2010 via the
invitation. If participants wanted to be included in the draw for prizes they were asked to include their email address in the final question of the survey. Participants were informed in the invitation email that their name and email address would not be used for the purposes of the research and would not be linked to their responses. A survey reminder electronic notification was sent from the same Holland College representative on December 14, 2010 to all students’ and instructors’ Holland College email accounts inviting further participation.

**Informed Consent**

Participation in the study was voluntary. As noted above, emails were sent to students and instructors inviting participation. The email informed recipients the survey was voluntary and identities would be kept confidential. After reading the invitation students and instructors could continue to the survey or choose not to complete the survey. In an effort to increase completion rates the respondents were given an option to enter their name into a draw to win an IPad or IPod. Respondents were informed that their name would not be linked to their survey responses. The purpose, nature of the assessment, and confidentiality were reiterated in the introduction to the survey. A signed consent was not deemed necessary as it could potentially lead to the identification of respondents.

**Instrument**

Electronic student and instructor surveys were used by the College to collect the primary data. Different questions were asked of students and instructors, taking into consideration their varying roles and interactions with e-learning and technology. The College decided not to use the term e-learning due to the ambiguity and various definitions associated with the term, instead the survey referred to technologies used for learning, teaching, or education. The College researchers examined a number of options to gather the data, including developing a survey in-house, using
an off-the-shelf survey, or adapting an existing survey. Due to the need to generate data quickly and effectively from a large population, the College researchers decided to adapt an existing survey.

The CDW:G 21st Century Campus Assessment Tool was selected by the Holland College researchers as an appropriate template for the surveys. The researchers reviewed the template surveys for language and applicability to Holland College. Revisions to the surveys were submitted by the Holland College researchers with the application for research involving human subjects to the Holland College Research Ethics Board (REB). The application was submitted on November 10, 2010 and written approval and certification of the research was received by Holland College on December 7, 2010.

The surveys were hosted on the learning management system, SAM. The surveys were intended to be released on December 6, 2010, but were delayed until Dec 7, 2010 pending Holland College’s REB approval. The surveys were made available until December 17, 2010, which was the last day of classes at Holland College before the Christmas break. The researchers selected a two week time frame based on their previous experiences in surveying Holland College students and instructors. In past experiences, longer time frames did not illicit a significant increase in response rates (H. Beattie, personal communications, September, 2010).

In an effort to increase participation, prize draws were offered. The details of the draws were outlined in the invitation to participate. In an effort to further increase participation, a reminder to participate email was sent on December 14, 2010 from a Holland College representative to all students and instructors. When the survey closed, a Holland College representative removed the surveys from the accessible area of SAM and the data was stored in a
secure password protected area, only accessible via password by the Holland College researchers.

Each completed survey was assigned a number, and each number had an associated email address for the prize draws. Two management representatives from the College drew numbers that were then cross-referenced to the email addresses to determine the winners of the prize draws. Notifications of the prize winners were sent on December 17, 2010 at 4:30pm via email from a Holland College representative.

**Student Survey**

The students’ survey was conducted over a thirteen day time frame. The surveys launched on December 7, 2010 and closed on December 17, 2010. Students received an electronic invitation to participate from a Holland College representative. The invitation was sent to all Holland College students’ email accounts. Upon opening the email the students were informed of the purpose of the survey and were invited to participate.

The electronic invitation included information pertaining to the purpose and the estimated length of time needed to complete the survey. Information on the voluntary nature, confidentiality, and the prize draws were also included in the invitation email. If a student decided to participate in the survey the student clicked on a link to the ‘Technology Survey’. The link took students to the survey located on SAM. Internet was required to access and complete the survey. Once the survey was accessed, the introduction to the survey appeared on the student’s computer screen. The introduction reiterated the purpose, voluntary nature, privacy, time, and that the results would be reported in aggregate. Students could then select the ‘complete survey’ button to access the survey questions.
The survey consisted of 45 straight-forward and simply-worded questions. Forty questions were either categorical or Likert scales. Four questions were open-ended to generate feedback in the respondents own words. The final question asked students to provide their email address in order to be entered into the prize draw.

The students answered the questions by using a computer mouse or keyboard to select the circle beside the appropriate response. Once selected a black dot appeared in the circle and the question was answered. The survey took approximately 15 minutes for the students to complete. Upon completion the students were required to select the ‘submit’ button. Once submitted, the completed surveys were automatically sent to a secure password protected LOR on SAM that was only accessible by the Holland College researchers.

Instructor Survey

The instructors were surveyed over the same time frame as the students. As per the students, the instructors received an email invitation to participate in the study from a Holland College representative. The email was sent to the instructors’ Holland College email account. Upon opening the email the instructors were informed of the purpose of the survey and were invited to participate.

The email invitation included information pertaining to the purpose and estimated length of time to complete the survey. Further information concerning confidentiality, the prize draws, and the reporting of the results was provided. Instructors were asked in the invitation to encourage the students to complete the student version of the survey. If an instructor decided to participate in the survey the instructor clicked on a link, entitled ‘Technology Survey’. The link connected to the survey stored on SAM. The instructors required Internet access to connect to the survey from the link. Once the survey was accessed, the introduction to the survey appeared on
the instructor’s computer screen. The introduction reiterated the purpose, voluntary nature, privacy, length of time needed to complete and aggregate reporting of the results. Instructors selected the ‘complete survey’ button to access the survey questions.

The surveys included a series of 48 categorical and Likert scale questions interspersed with open ended questions. The final question allowed instructors to provide their email address to be entered into the prize draw. The instructors answered the questions by using a computer mouse or keyboard to select the circle beside the appropriate response. Once selected a black dot appeared in the circle and the question was answered. Approximately 15-25 minutes was needed for the instructors to complete the survey. Additional time was allocated to the instructors’ survey as more opportunity was provided for open text comments. Upon completion the instructors were required to select the ‘submit’ button at the end of the survey. The completed survey was instantaneously sent to a secure password protected LOR on SAM that was only accessible by the Holland College researchers.

After data collection and analysis by the Holland College researchers, a representative from the College deposited the data into a secure, private learning object repository on SAM specific to the researcher of this study. The study researcher obtained access to the data by selecting the ‘Faculty & Staff’ tab on the Holland College website. Once selected, the researcher was directed to a new web page with a list of items. The researcher selected the item ‘SAM-college portal’. The researcher was then prompted to enter a username and password that was provided by a Holland College representative. The username and password allowed access to the LOR and the electronic surveys. The surveys were created via the SAM survey tool and were available in the same form as that provided to the students and instructors. The researcher was able to access reports that summarized the responses and export the raw data, in its entirety, to an
excel spreadsheet. Once accessed, the data analysis involved the reexamination of the existing survey data to address the specific research questions associated with this study (Fleenor & Braddy, 2009; Neuman, 2006). The excel spreadsheets were stored in a secure password protected folder on the researchers computer. Data was deleted from the researcher’s file once the data analysis was complete.

**Data Analysis**

In an effort to address the research questions the raw data was analyzed using a variety of statistical processes. The types of data analysis depended on the types of data collected, the research design, the research purpose, and the research questions (Nardi, 2006). The selected research design entailed a quantitative descriptive statistical analysis of Holland College students’ and instructors’ perceptions at a particular point in time.

The data analysis consisted of an examination of the raw data from the student and instructor surveys that corresponded with each research question. The survey questions were reviewed and sorted under the appropriate overarching topic associated with the main study questions. The first topic analyzed was benefits (RQ1). The topics that followed included use patterns (RQ2), importance (RQ3) and challenges (RQ4). Once the survey questions were categorized, the majority of the data was analyzed through quantitative methods involving statistical measurements including summations, averages, percentages, and frequencies.

The selected survey data from the student and instructor surveys was used to describe the demographic characteristics of the samples and measure attitudes and opinions of both groups with regards to technologies for learning. The data from the categorical scale questions was analyzed by tabulating the number of responses for each answer and calculating the percentages.
Four-point Likert scale questions were used to determine the degree of importance respondents placed on certain technologies for learning. The four-point Likert scales were forced choice questions, as a neutral option was not provided. The Holland College researchers chose the four point scale in an effort to get a more positive or negative response as the neutral response could lead to inconclusive results.

The trends identified in the analysis were further supported with an analysis of key themes arising from subjective data generated from open-ended questions. The written text data was analyzed and compared for the reoccurrence of key words and themes. The most common themes were identified from the literature or from the comments and described in further detail, where possible. The themes were tabulated including the frequency of the theme and the percentage of respondents associated with each theme.

Demographics

Data from respondents included demographic information that was analyzed in relation to the demographic data on the broader study populations. Four questions in the student survey concerning age, gender, year of study, and program of study provided the demographic data of the student sample (student survey question 1, 2, 3, 4). The responses to these questions were used to describe the sample. Two questions in the instructor survey concerning age and gender were used to describe the instructor sample (instructor survey question 1, 2). The number of responses for each option was tabulated and the percentages were calculated to provide for a statistical representation of the data. Comparisons to the overall populations were then conducted to determine how representative the respondents were of the total population.
Benefits

Research question one (RQ1) was asked to uncover the benefits pertaining to technologies used for learning. Neither survey included a question specific to benefits, however it was an important measurement identified by the management of Holland College. As such, the researcher analyzed student question 34 and instructor question six to extrapolate the data pertaining to benefits. The respondents were asked the following question: How does having a technology-rich classroom/learning environment change the way you/students learn? The survey results were reviewed to identify responses pertaining to the benefits of technologies for learning. The responses were categorized under the appropriate theme as identified in the research by the Canadian Council on Learning (2009). The themes included ‘Accessibility & Flexibility’, ‘Academic Achievement’, ‘Remote Learners’, ‘Collaboration & Communication’, and ‘Societal Demands’ (Canadian Council on Learning, 2009). The data was analyzed for the key themes. The frequency of occurrences for each theme was calculated and presented in tabular form along with the percentage of respondents associated with each theme.

Use Patterns

The analysis of technology use patterns related to research question two (RQ2). Ten questions were selected to provide a better understanding of student and instructor technology use patterns. Five questions from the student survey and five corresponding questions from the instructor survey were selected and analyzed to describe the technology use patterns of students and instructors.

Question 18 on the student survey and question nine on the instructor survey asked respondents to select the five technologies used most often for education. The number of responses for each of the options was calculated and the percentages were determined. The
options were ordered from the most used technology for learning to the least used technology for learning.

To determine the students’ and instructors’ frequency of technology use for education, question 20 on the student survey and question 11 on the instructor survey were analyzed. The questions asked how often respondents used technology for education. Respondents could choose from the following options: ‘every day’, ‘at least once a week’, ‘several times throughout the year’, ‘rarely’, and ‘never’. The number of responses for each of the options was tabulated and percentages were calculated.

As the majority of classes at Holland College are offered in a face-to-face classroom setting, for the purposes of this research virtual learning was classified as an alternative technology. Question 36 on the student survey asked students if they had ever taken a virtual class and question 40 on the instructor survey asked instructors if they offered virtual learning in their classes. Students could select ‘yes’ or ‘no’, while instructors could select ‘yes’, ‘no’, or ‘no, but I am considering’. The number of responses for each option was tabulated and the percentages of the responses were determined.

Electronic books (e-books) were also considered an alternative technology, as the technology is relatively new and has not yet been fully adopted at a societal level across Canada, nor at the College campus level. Question 40 on the student survey and question 43 on the instructor survey asked if respondents used e-books. Students and instructors could select ‘yes’ or ‘no’. The numbers of responses for each of the options were determined and the percentages were calculated.

The final analysis of student and instructor use patterns pertained to underutilized technologies. Question 28 on the student survey and question 25 on the instructor survey asked
respondents to choose the one technology not currently available that they would most like for education. Respondents could select one answer from a list of options. The responses for each option were derived and percentages were calculated to determine the technologies students and instructors considered underutilized or unavailable.

**Importance**

Research question three (RQ3) sought to determine the importance of certain technologies for learning. Eight questions in total were analyzed. Four questions from the student survey (student survey questions 6,11,13,16) and four corresponding questions from the instructor survey (instructor survey questions 12,17,18,21).

The questions consisted of four-point Likert scales where respondents were asked to rate how important certain technologies were for learning. Respondents could choose from: (1) ‘extremely’, (2) ‘somewhat’, (3) ‘not very’, or (4) ‘not at all’. Respondents were asked to rate the following technologies: wireless network, distance learning, campus computer labs, and social networking. The responses were calculated and the average response was provided on a four-point scale for each technology. Percentages for each response were derived and a graphical representation of the results was provided for both the instructor and student responses.

**Challenges**

Two survey questions from each survey were selected and analyzed to determine the challenges and barriers with regards to technology for learning and teaching at Holland College. The questions were analyzed to respond to research question four (RQ4). Question 30 on the student survey and question 37 on the instructor survey asked respondents to identify the challenges to classroom technology at Holland College. Respondents could select three of the
seven responses. The responses for each option were counted and the percentages were calculated.

Question 31 on the student survey and question 38 on the instructor survey were open-ended questions that allowed respondents to list any other challenges or barriers to technology for learning. The responses were analyzed for themes. The themes were listed and the occurrences for each theme were calculated. The themes were presented in rank order from the most often cited challenge to the least cited challenge to technologies for learning.

Confidence Intervals

Confidence intervals enabled a prediction of the likelihood that the mean is within a specified range in accordance with a particular level of confidence (Currell & Dowman, 2005). The higher the confidence interval, the more confident the researcher can be that the estimated or calculated mean from the sample reflected the true value of a mean. By using a sample calculator on the Raosoft website (Raosoft, 2010), the researcher determined the student sample confidence interval was 95 percent and the instructor sample confidence interval was 78 percent. The student confidence interval was acceptable to generate a meaningful analysis, at 95 percent. Due to the smaller population and sample size of instructors, the confidence interval was low, meaning the data may be less meaningful from a research perspective. However, the sample of instructors represented 28 percent of the population while only 18 percent of the sample represented students.

Validity and Reliability

Validity refers to the accuracy of the research in measuring what the researcher claimed to measure in the stated research questions (Nardi, 2006). Several approaches and techniques are
available for assessing validity and reliability with regards to academic research. The research was tested for validity through face validity, which is a consensus based on subjective assessments, that the research does what the researcher intended.

Alternatively, reliability refers to the consistency or repeatability of the research findings (Nardi, 2006). For example, if the research can be repeated using similar research parameters, study results similar to the original findings should be expected. Reliability can be determined and measured through various assessments, such as test-retest, parallel reliability, inter-item reliability, split-half reliability, and inter-rater reliability.

As the research was conducted specifically for the College no formal techniques were applied. However, as the surveys were based on the existing CDW-G campus assessment tool, a comparison of the results could be conducted afterwards to determine reliability. While the research methods may be reliable due to the fast pace of technological change along with changes to the sample demographics and skill levels, if repeated using the same student and instructor samples, the results would likely vary at a different point in time.

Summary

Chapter 3 began with an introduction to the methodology of the study. A description of the data collection and analyses process was presented. The methodology outlined in Chapter 3 provided the framework for the results described in Chapter 4. The demographics of the sample along with the descriptive statistical analyses and theme analyses of the benefits, use patterns, importance, and challenges of technologies used for learning are presented in Chapter 4.
CHAPTER 4: RESULTS

The research methodology described in Chapter 3 was prepared to provide a framework for gathering the data and reporting the results. Results arising from the data analysis will be described in Chapter 4. As noted in Chapter 3, the primary purpose of the quantitative study was to describe the perceptions of students and instructors with regards to technologies used for learning at Holland College as of December 2010. The researcher sought to describe the benefits associated with a technology rich learning environment, the technologies used by students and instructors for learning and teaching, the importance of certain technologies for learning, and the challenges associated with technologies used for learning and teaching at Holland College.

Following the research methodology outlined in Chapter 3, the fourth Chapter incorporates the selection of statistical techniques to present the data in a meaningful manner. Chapter 4 begins with a description of the samples and a comparison of the sample demographics with those of the overall populations. An analysis of the data according to each overarching topic and corresponding research question was conducted and the findings are presented in text, tabular, and graphical form.

Overview of Data Collection

The survey data was collected by a Holland College representative as outlined in Chapter 3 and provided as secondary data for the purposes of this research. After collection, the Holland College representative deposited the data into a secure, private learning object repository set up specifically for the study researcher on the learning management system, SAM. Access to the data was granted through a secure password protected area specific to the study researcher. As the surveys were developed using the SAM survey tool, the data were available to view in full
text form. The researcher was able to access reports summarizing the responses and could export
the raw data in its entirety to an excel spreadsheet for further analysis.

After reviewing the data the researcher selected 26 survey questions (13 from each
survey) for consideration in relation to fulfilling the study purpose. Eleven close-ended questions
and two open-ended questions were selected from each survey. In an effort to organize and
categorize the survey questions and corresponding data, two tables were prepared. One table was
specific to students and the other was specific to instructors. The tables consisted of the
following topics: demographics, benefits, use patterns, importance, and challenges. Listed
beneath each topic were the corresponding survey questions to be analyzed. Table 1 entitled
‘Research Topics and Selected Student Survey Questions for Analysis’ and Table 2 entitled
‘Research Topics and Selected Instructor Survey Questions for Analysis’ depict the study
research topics and the corresponding survey questions.
Table 1: Research Topics & Associated Student Survey Questions

<table>
<thead>
<tr>
<th>Research Topics and Selected Student Survey Questions for Analysis</th>
<th>Question</th>
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<tbody>
<tr>
<td><strong>Demographics</strong></td>
<td></td>
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<tr>
<td>Q1</td>
<td>Age</td>
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<tr>
<td>Q2</td>
<td>Gender</td>
</tr>
<tr>
<td>Q3</td>
<td>Program</td>
</tr>
<tr>
<td>Q4</td>
<td>Year</td>
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<tr>
<td><strong>Benefits (R Q1)</strong></td>
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</tr>
<tr>
<td>Q34</td>
<td>How does having a technology-rich classroom/learning environment change the way you learn?</td>
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<tr>
<td><strong>Use Patterns (R Q2)</strong></td>
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<tr>
<td>Q18</td>
<td>Which of the following technologies do you use most often for education (e.g., to study, while in class, to work on projects)? Please select the top 5 responses.</td>
</tr>
<tr>
<td>Q20</td>
<td>How often do you use technology for education (e.g., to study, while in class, to work on projects)?</td>
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<tr>
<td>Q36</td>
<td>Have you ever taken a class that used virtual learning?</td>
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<tr>
<td>Q40</td>
<td>Do you currently use e-book/digital textbooks?</td>
</tr>
<tr>
<td>Q28</td>
<td>Please select the one technology tool that you DO NOT currently use or have at your disposal that you believe, would be most useful in your studies.</td>
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<tr>
<td><strong>Importance (R Q3)</strong></td>
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<tr>
<td></td>
<td>How important is it that Holland College offers the following to students? Please answer extremely, somewhat, not very, or not at all under each of the following.</td>
</tr>
<tr>
<td>Q6</td>
<td>Wireless network access</td>
</tr>
<tr>
<td>Q11</td>
<td>Distance education</td>
</tr>
<tr>
<td>Q13</td>
<td>Campus Computer labs</td>
</tr>
<tr>
<td>Q16</td>
<td>Social Networking</td>
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<tr>
<td><strong>Challenges (R Q4)</strong></td>
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<tr>
<td>Q30</td>
<td>What is the biggest challenge to classroom technology at Holland College? Please select the top 3.</td>
</tr>
<tr>
<td>Q31</td>
<td>Please list any other barriers or challenges to technology use at Holland College</td>
</tr>
</tbody>
</table>
### Table 2: Research Topics & Associated Instructor Survey Questions

<table>
<thead>
<tr>
<th>Research Topics and Selected Instructor Survey Questions for Analysis</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td></td>
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<tr>
<td>Q1 Age</td>
<td></td>
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<tr>
<td>Q2 Gender</td>
<td></td>
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<tr>
<td>Benefits (RQ1)</td>
<td></td>
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<tr>
<td>Q6 How does having a technology-rich classroom/learning environment change the way students learn?</td>
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<tr>
<td>Use Patterns (RQ2)</td>
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<tr>
<td>Q9 Which of the following technologies do you use most often for teaching? Please select the top 5.</td>
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<tr>
<td>Q11 How often do you use technology as a teaching tool?</td>
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<tr>
<td>Q25 Please select the one technology tool that you DO NOT currently use or have at your disposal that you believe, would be most useful to support and enhance your program.</td>
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<tr>
<td>Q40 Do you offer virtual learning in the classes that you teach?</td>
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<tr>
<td>Q43 Do you currently use e-book/digital textbooks for teaching or for your personal life?</td>
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<tr>
<td>Importance (RQ3)</td>
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<tr>
<td>Q12 Wireless network access</td>
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<tr>
<td>Q17 Distance education</td>
<td></td>
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<tr>
<td>Q18 Campus computer labs</td>
<td></td>
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<tr>
<td>Q21 Social networking</td>
<td></td>
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<tr>
<td>Challenges (RQ4)</td>
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<tr>
<td>Q37 What is the biggest challenge to classroom technology at Holland College? Please select the top 3.</td>
<td></td>
</tr>
<tr>
<td>Q38 Please list any other barriers or challenges to technology use at Holland College.</td>
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</tbody>
</table>

The selected data associated with each survey question were reviewed and analyzed to address the overarching topic and corresponding research question. Chapter 4 provides the results of the data analysis generated in response to each research question. Prior to presenting the data specific to each research question, a description of the demographic populations of the study is provided.
Demographic Data

Demographics are the characteristics of a population and include age, gender, and race. The data concerning demographics allows for generalizations about a population and in some cases a deeper understanding of the population may be achieved. The collection of demographic data in the study pertained to both students and instructors, allowing for a description of the two samples and a comparison to the broader populations of Holland College. Details pertaining to each sample and the broader populations follow.

Demographics of the Student Sample

The student sample demographic data included age, gender, program of study, and year of study. The sample of students consisted of 533 participants from Holland College, or 18 percent of the general student population which was made up of 2925 individuals. Of the general population, three sub-populations of students were identified by Holland College management:

1) Full-time and Part-time post-secondary students

2) Adult Education & GED students

3) Language Training students

The largest sub-population was the Full-time and Part-time post-secondary students consisting of 1997 students. Of this sub-population, 510 participated in the survey. The sample represented 26 percent of the sub-population. Adult Education & GED students accounted for 578 students within the general population. Twenty-one of the survey respondents were in Adult education & GED, which represented four percent of that sub-population. Only one student from the 350 Language Training students participated in the survey, representing only 0.3 percent of that sub-population. Lower response rates were expected for both the Adult Education & GED
and Language Training students due to limited email access and use of these sub-populations coupled with possibly lower language and technology skills.

The general population demographic data pertaining to age and year of study was not available. The sample data was only compared to the data for the largest sub-population of full-time and part-time post-secondary students. The sub-populations of Adult Education & GED students and Language Training students are enrolled in programs with varying timelines of delivery with a continuous in-take and out-take of students. As such, the additional data was unavailable and comparison could only be made to the Full-time and Part-time post-secondary students.

Students in the sample ranged in age from under 20 to over 50. Two-hundred and twenty students identified themselves as being 20 years of age or under accounting for 41 percent of respondents. Further to that, 140 students or 26 percent of the students in the sample were 21 to 24 years of age, 93 students or 18 percent were 25 to 34, 71 students or 13 percent were 35 to 49, and nine respondents or two percent were 50 years of age, or over. Figure 1 provides a graphical representation of respondents by age range.

*Figure 1: Student Sample by Age Range*
Data concerning the overall sub-population of Full-time and Part-time post-secondary students revealed that 898 students, or 45 percent were 20 and under, 519 students, or 26 percent were between the ages of 21-24, 339 students or 17 percent were between the ages of 25-34, 199 students or ten percent were between the ages of 35-49, and 40 students or two percent were 50 and over. The percentage of respondents in the 21-24 age range was identical for the sample and the sub-population. A one percent variance between the sample and the sub-population was noted for respondents between the ages of 25-34. The sample of respondents between the ages of 35-49 was three percent higher than the sub-population and the largest variance between the sample and the sub-population was noted for the students that were 20 and under, the sample was 41 percent, while the overall sub-population consisted of 45 percent.

In question two of the student survey, respondents were asked to provide gender information. Of the 533 respondents, 292 identified themselves as female, accounting for 55 percent of the respondents. The number of male respondents was slightly lower at 240, representing 45 percent of the sample respondents. The percentages of students identified as male and female in the sample were directly proportional with the percentages for the general student population composed of the three sub-populations. The overall population consisted of 1609 female students or 55 percent and 1316 male students or 45 percent of the population.

The next demographic question asked respondents to identify a program of study from a list of 16 options. The options included 13 post-secondary programs listed in Table 3, as well as ‘Adult learning & GED’, ‘Language Training’, and ‘Other’. The number of respondents associated with each program is provided along with the representative percentage. For comparison, the corresponding data for the overall general population is provided as well.
Of the 533 student respondents, 102 or 19 percent identified ‘other’ as the program of study. Fifteen percent of students in the sample were in the Culinary Arts program, 12 percent were in the Business Studies program, 11 percent were in Computer Studies, with nine percent in Health & Community Studies and nine percent in Trades & Industrial Technology. A summary of the data is provided in Table 3 below.

Table 3: Students and Program of Study

<table>
<thead>
<tr>
<th>Program</th>
<th>Sample</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culinary Arts</td>
<td>79</td>
<td>210</td>
</tr>
<tr>
<td>Business Studies</td>
<td>64</td>
<td>320</td>
</tr>
<tr>
<td>Computer studies</td>
<td>59</td>
<td>104</td>
</tr>
<tr>
<td>Health &amp; Community Services</td>
<td>47</td>
<td>324</td>
</tr>
<tr>
<td>Trades &amp; Industrial Tech</td>
<td>47</td>
<td>291</td>
</tr>
<tr>
<td>Sport &amp; Leisure</td>
<td>39</td>
<td>168</td>
</tr>
<tr>
<td>Tourism &amp; Travel</td>
<td>27</td>
<td>126</td>
</tr>
<tr>
<td>Adult Education</td>
<td>21</td>
<td>578</td>
</tr>
<tr>
<td>Applied Science &amp; Engineering Tech</td>
<td>16</td>
<td>103</td>
</tr>
<tr>
<td>College Foundation</td>
<td>16</td>
<td>34</td>
</tr>
<tr>
<td>Atlantic Police Academy</td>
<td>8</td>
<td>113</td>
</tr>
<tr>
<td>B.Ed./CAE</td>
<td>4</td>
<td>33</td>
</tr>
<tr>
<td>Media &amp; Communications</td>
<td>2</td>
<td>143</td>
</tr>
<tr>
<td>Marine Training</td>
<td>1</td>
<td>28</td>
</tr>
<tr>
<td>Language Training</td>
<td>1</td>
<td>350</td>
</tr>
<tr>
<td>Other</td>
<td>102</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>533</strong></td>
<td><strong>2925</strong></td>
</tr>
</tbody>
</table>

The data pertaining to the program of study is difficult to compare to the overall student population as 19 percent of the respondents selected ‘other’. As some students could not identify a program of study from the list provided it appears there may be inherent problems with the question and the option list that was available. Since the actual program of study is not available
for the entire sample the results are inconclusive as a comparison. While the sample may not be comparable, or completely representative, of the overall population, it does show there is representation of students from all programs of study. The largest variance between the sample and the actual population is noticed in the higher representation of the computer studies students and culinary arts students. While the Adult Education & GED students, Media & Communications students, and Language Training students were under-represented.

The final student demographic measured was year of study. Of the student respondents, 70 percent identified themselves as first year, 29 percent identified themselves as second year, and one percent identified as being in third year or more. These numbers are comparable to the sub-population of the full-time and part-time post-secondary student population, where 74 percent of students were in first year, 23 percent were in second year, and three percent identified as being enrolled in third year or more. The data pertaining to year of study for Adult Education & GED students and Language Training students cannot be expressed in the yearly time frames due to the length of programs and the structure of the courses.

*Demographics of the Instructor Sample*

The collection of demographic data pertaining to instructors’ age and gender occurred via the instructor survey. The program of instruction data was omitted due to ethical concerns, as potential existed to identify the actual respondent in those programs with only one or very few instructors. The instructor sample included a total of 109 instructor participants from Holland College, which represented 26 percent of the instructor population of 385 individuals.

The instructor sample consisted of 48 females, or 44 percent of the respondent sample. Male instructors accounted for 61 of the responses, representing 56 percent of the sample. The results for the general population were practically the exact opposite with 55 percent of the
instructors identified as female, and 45 percent identified as male. An 11 percent variance was observed between the sample and the instructor population.

The next piece of sample demographic data pertained to the age of instructors. Instructors could choose from four age ranges on the survey. Ten instructors identified themselves as between 20 to 34 years of age, accounting for nine percent of respondents. Thirty-four instructors identified themselves as between the ages of 35 to 44, or 31 percent of respondents. Forty-four instructors, 44 percent of respondents, were between the ages of 45 and 54. Finally, 19 percent or 21 instructors were fifty-five or over. Figure 2 provides a graphical representation of the percentage of instructors belonging to each of the specified age ranges listed on the survey.

*Figure 2: Instructor Sample by Age Range*

In comparison, the general instructor population consisted of 15 percent between the ages of 20 to 34 years, 29 percent between the ages of 35 to 44 years, 30 percent between 45 to 54 years of age, and 25 percent who were 55 years and older. The most noticeable differences between the sample data and the general population with regards to age is that of the 45 to 54
year olds, as there is a 14 percent difference between the sample data and the general population data.

Data Analyses and Results

Holland College provided the secondary data regarding student and instructor perceptions in electronic form that was easily transferred to summary reports and spreadsheets. The transferred data was analyzed to provide for the findings of the research. In an effort to address the specific research questions, analyses including summations, percentages, means and frequency counts. The following sections are based on the broad topic areas outlined in the methodology of benefits, use patterns, importance, and challenges. Each topic corresponds to a specific research question. Under each topic, an explanation of the research question along with the data analysis processes and results of the analysis is provided.

Benefits

Benefits are considered to be something that is advantageous or good. The researcher sought to uncover the advantages of e-learning as perceived by the students and instructors. The rationale was that a better appreciation of the benefits of e-learning may enable the management to develop a plan based on the benefits identified to enhance e-learning experienced by Holland College students and instructors. The first research question (RQ1) asked the following: From the perspectives of students and instructors at Holland College, what are the benefits of a technology-rich learning environment?

To answer the research question, analysis of data from one open-ended question on the student survey (question 34) and one open-ended question from the instructor survey (question 6) occurred. Both open-ended questions asked participants to describe how a technology-rich
classroom/learning environment changed learning. Each response to the open-ended survey question was read and coded using the thematic benefits of e-learning as identified in the research conducted by the Canadian Council of Learning (CCL) (2009). The thematic definitions from the CCL were derived from the literature to fit the purposes of this study. Table 4 provides a summary of the benefit themes and definitions.

**Table 4: Benefits: Qualitative Themes & Descriptions**

<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Achievement</td>
<td>Improves learning, makes the learning material more interesting and more engaging and therefore leads to greater academic achievement, responds to different learning styles so all learners have a better chance of success.</td>
</tr>
<tr>
<td>Flexible &amp; Accessible</td>
<td>Enables learning to take place anywhere and at anytime. Learning materials are easily accessible while on or off campus.</td>
</tr>
<tr>
<td>Societal Demands</td>
<td>Improves computer skills and provides training in skills required for future employment, prepares students for careers. Computer skills are a necessity in society.</td>
</tr>
<tr>
<td>Communication &amp; Collaboration</td>
<td>Increases the communication and collaboration of students with other students, and with the instructors, can occur in class through interactive learning materials and activities, or can occur outside of class through email, chat rooms, or the learning management system.</td>
</tr>
<tr>
<td>Remote Learners</td>
<td>Allows students who cannot attend classes to access learning materials. It provides for distance education to learners that are not in a centralized area.</td>
</tr>
</tbody>
</table>

The responses to question 34 on the students’ survey and question six on the instructors’ survey ranged from one word or short sentences to detailed and more thoughtful responses that included from three to five sentences and often touched on a number of themes. One-hundred and thirty-nine students’ responded to question 34 and 118 of the responses were analyzed for the key themes pertaining to benefits. Twenty-one student responses were not related to benefits. Of the 533 student respondents, 394 students opted not to respond, or did not provide relevant feedback specific to the benefits of a technology-rich learning environment. From the instructors’ survey, 88 of the 109 instructors responded. Five responses were not related to
benefits, therefore 83 instructor responses to question six on the instructors’ survey were analyzed in response to research question one.

The results from the theme analysis, provided in order from the most often cited to the least often cited are provided in Table 5 and Table 6. The number of respondents associated with each theme is provided along with the percentage of the 118 relevant student responses to survey question 34. A summary of the 83 relevant instructor responses and the associated percentages of responses to survey question six are provided. Restated survey questions along with the results are provided below in Table 5 and Table 6.

<table>
<thead>
<tr>
<th>Table 5: Students’ Responses categorized by Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Benefit Themes</td>
</tr>
<tr>
<td>Academic Achievement</td>
</tr>
<tr>
<td>Flexible &amp; Accessible</td>
</tr>
<tr>
<td>Societal Demands</td>
</tr>
<tr>
<td>Communication &amp; Collaboration</td>
</tr>
<tr>
<td>Remote Learners</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 6: Instructors’ Responses categorized by Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor Benefit Themes</td>
</tr>
<tr>
<td>Academic Achievement</td>
</tr>
<tr>
<td>Flexible &amp; Accessible</td>
</tr>
<tr>
<td>Communication &amp; Collaboration</td>
</tr>
<tr>
<td>Societal Demands</td>
</tr>
<tr>
<td>Remote Learners</td>
</tr>
</tbody>
</table>
As per the results outlined in Table 5 and 6, both the students and instructors most frequently cited ‘Academic Achievement’ as a benefit of e-learning. ‘Flexibility & Accessibility’ was the second most cited benefit for students, while this theme along with ‘Communication & Collaboration’ were mentioned an equal number of times in the instructor survey. Students and instructors alike cited ‘Remote learning’ the least often.

Use Patterns

The researcher sought to describe the use patterns of Holland College students and instructors. The data could provide the management with a clearer picture of the frequency of technologies used for learning, the different technologies used, the alternative technologies used, and the specific technologies that appear to be underutilized or unavailable for learning. In an effort to best inform the Holland College management of the student and instructor use patterns, the researcher attempted to address the following question (RQ2): From the perspectives of students and instructors at Holland College, how is technology used in the learning environment?

Five students’ survey questions (18, 20, 28, 36, and 40) and five instructors’ survey questions (9, 11, 25, 40, and 43) were analyzed to determine technology use patterns to address RQ2. Each survey question provided a different measure of the use patterns. The specific survey questions analyzed pertained to the following topics: technologies used most often for education, frequency of technology use, alternative technologies, and underutilized technologies. Detailed analysis pertaining to each question and topic follows.
Technologies Used Most Often for Education

Question 18 in the students’ survey and question 9 in the instructors’ survey asked respondents what technologies they used most often for education (either for learning or teaching). Respondents were asked to select up to five responses. Because the surveys for instructors and students were slightly different and considering the varying roles of students and instructors, some of the options listed in the surveys varied. The student survey included options for ‘on campus desktop computers’, ‘home desktop computers’, and ‘wikis’, however these options were omitted on the instructor survey. Additionally, the instructor survey included options for ‘interactive whiteboards’, and ‘student response systems (clickers)’. Respondents could choose up to five technologies; however some respondents chose only one or two answers. In total, 2193 options were selected by 533 student participants. From the instructor survey, 397 answers were given by 109 instructors. The overall results are provided in tabular form in Table 7 and 8. The tables include the list of technologies the respondents had to choose from, along with the number of respondents who selected that technology. The percentage of responses based on the total sample size for each population was provided.
Student Q18: Which of the following technologies do you use most often for education (e.g., to study, while in class, to work on projects)? Please select the top 5 responses.

**Table 7: Student Responses**

<table>
<thead>
<tr>
<th>Technology</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-campus desktop computer</td>
<td>417</td>
<td>78</td>
</tr>
<tr>
<td>Portable computer with wireless access</td>
<td>399</td>
<td>75</td>
</tr>
<tr>
<td>SAM</td>
<td>391</td>
<td>73</td>
</tr>
<tr>
<td>Home Desktop</td>
<td>307</td>
<td>58</td>
</tr>
<tr>
<td>Social Network</td>
<td>214</td>
<td>40</td>
</tr>
<tr>
<td>Smartphone</td>
<td>168</td>
<td>33</td>
</tr>
<tr>
<td>Online text/video</td>
<td>123</td>
<td>23</td>
</tr>
<tr>
<td>Wikis</td>
<td>87</td>
<td>16</td>
</tr>
<tr>
<td>Blogs</td>
<td>39</td>
<td>7</td>
</tr>
<tr>
<td>Podcast</td>
<td>21</td>
<td>4</td>
</tr>
<tr>
<td>Web-conference</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>E-reader</td>
<td>11</td>
<td>2</td>
</tr>
</tbody>
</table>

Instructor Q9: Which of the following technologies do you use most often for teaching? Please select the top 5 responses.

**Table 8: Instructor Responses**

<table>
<thead>
<tr>
<th>Technology</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop computer</td>
<td>101</td>
<td>93</td>
</tr>
<tr>
<td>SAM</td>
<td>79</td>
<td>72</td>
</tr>
<tr>
<td>Digital content</td>
<td>72</td>
<td>66</td>
</tr>
<tr>
<td>Portable computer with wireless access</td>
<td>40</td>
<td>37</td>
</tr>
<tr>
<td>Interactive Whiteboards</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>Online text/video</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>Social Network</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Blogs</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Student response systems 'clickers'</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Smartphone</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Podcast</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Web-conference</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>E-reader</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Students appear to rely most heavily on the ability to access computers for learning. The technologies used most often by student respondents included on-campus computers, portable computers, SAM, and home desk-top computers. Three of the technologies identified are hardware, while SAM is software. Similar data was observed in the instructor responses with over 92 percent reporting the use of desktop computers most often for education. Other technologies reportedly used by instructors included SAM, digital content, and interactive whiteboards. Smartphones and social networking were used much more often by students than instructors. Furthermore, neither group reported using interactive technologies such as blogs, wikis, web-conferencing, or podcasts often for learning. E-readers were the least used technology as reported by both the student and instructor sample.

Frequency of Use

Question 20 in the students’ survey and question 11 in the instructors’ survey asked respondents how often they used technology for education (learning or teaching). The responses from 533 student participants were as follows: 431 students, or 81 percent of the sample, reported using technology everyday for learning. Seventy-six, or 14 percent, reported using technology for learning at least once a week. Twelve students, accounting for two percent of the sample, used technology several times throughout the semester, another 12 students, or two percent used technology rarely, and one, or 0.2 percent reported that they never use technology for learning.

Of the 109 instructor respondents, 95 instructors, representing 87 percent of the sample reported using technology everyday for teaching. Nine instructors, or eight percent, reported using technology at least once a week for teaching. Three instructors, or 3 percent, reported using technology several times a month for teaching and two, which corresponded to two percent of
the sample reported using technology rarely for teaching. No respondents answered ‘never’. A restatement of the survey questions along with a summary of the percentage of student respondents and instructor respondents associated with each option is provided in Table 9.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>% of Students</th>
<th>% of Instructors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Everyday</td>
<td>81</td>
<td>87</td>
</tr>
<tr>
<td>At least 1/week</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Several/month</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Rarely</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Never</td>
<td>0.2</td>
<td>0</td>
</tr>
</tbody>
</table>

**Student Q20: How often do you use technology for education?**
**Instructor Q11: How often do you use technology as a teaching tool?**

**Table 9: Frequency of Use**

*Alternative Technologies*

Alternative technologies are defined for the purposes of this research as those technologies that are relatively new and/or not used on a regular basis at Holland College. Two technologies were included in this category: virtual learning and electronic textbooks. Survey questions were asked to determine the extent of use of these technologies by students and instructors at Holland College. The results follow.

Virtual learning is described as the delivery of education to students regardless of where the instructor and/or other students are located. Examples of virtual learning include, online classes, distance learning, instructors bringing in guest speakers through video conferencing, and collaboration with instructors and students in other locations. Survey question 36 and 40 sought to determine the student and instructor exposure to this type of education.

Question 36 on the students’ survey asked if students had ever taken a class that used virtual learning. The answer options for this survey question were ‘yes’ and ‘no’. Question 40 on
the instructors’ survey asked if instructors had ever offered a virtual learning course. Instructors could choose from three responses, ‘yes’, ‘no’, and ‘no, but I am considering offering virtual learning’. The definition for virtual learning was provided as a precursor to the question on both surveys.

Five-hundred and thirty-one of the 533 students responded to survey question 36. Of the student respondents, 155 or 29 percent responded ‘yes’ they had taken a virtual learning class and 376 or 71 percent of students responded ‘no’, they had not taken a virtual learning class. Of the 109 instructors who responded to the survey question, 19 reported that they offered virtual learning, representing 17 percent of the sample. Sixty-eight respondents or 62 percent responded ‘no’, they did not offer virtual learning. And 21 instructors, accounting for 19 percent of the sample, responded ‘no but I am considering offering virtual learning’.

For the purposes of this research, electronic books (e-books) were described on the surveys as digital/online textbooks/e-texts used as an alternative to traditional print textbooks. Furthermore the definition stated that textbooks are delivered via a computer and no hard copy of the book is required. E-books can be accessed via desktop or portable computing devices although new e-reader technologies such as the Kindle are now being used specifically for e-books.

To understand the use of e-books by students and instructors at Holland College, question 40 on the students’ survey and question 43 on the instructors’ survey asked if the participants used e-books or digital text books. Participants could respond ‘yes’ or ‘no’. Five-hundred and twenty-six students of the 533 participants responded to the question. Of the respondents, 84 students or 16 percent responded ‘yes’ they have used e-books, while 442 students, representing 84 percent of the sample, responded ‘no’, they have not used e-books. From the instructors’
survey, 20 instructors, or 18 percent, responded ‘yes’ they have used e-books and 88 instructors, or 82 percent, responded ‘no’ they had not used e-books.

Underutilized Technologies

Understanding what technologies students and instructors would like to use may help the College in determining what additional technology investments could be made to further support and enhance learning. The researcher sought to determine technologies students and instructors consider beneficial to learning that are unavailable or underutilized. Question 28 on the students’ survey and question 25 on the instructors’ survey asked respondents to select one technology they do not currently use or do not have at their disposal that they believe would be beneficial to learning.

Due to differences in the surveys and considering the varying roles of students and instructors, the options listed varied. The students’ survey consisted of 11 options including ‘interactive whiteboards’ however that option was omitted on the instructors’ survey. Additionally, the instructors’ survey contained 12 options including an option of ‘I have all the technology I need at my disposal’ and ‘desktop computer’. Respondents were asked to select one response however, some participants did not respond while others selected more than one technology.

In total 508 responses were provided from the 533 student participants. From the instructors’ survey, 141 responses were provided from 109 instructors. The responses were tabulated and are depicted in order of frequency in Tables 10 and 11.
Q28: Please select the one technology tool that you DO NOT currently use or have at your disposal that you believe would be most useful to your studies.

**Table 10: Student Responses**

<table>
<thead>
<tr>
<th>Technology</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-reader device</td>
<td>109</td>
</tr>
<tr>
<td>Interactive whiteboards</td>
<td>71</td>
</tr>
<tr>
<td>Blogs for specific courses</td>
<td>71</td>
</tr>
<tr>
<td>Portable computer</td>
<td>58</td>
</tr>
<tr>
<td>Smartphone</td>
<td>57</td>
</tr>
<tr>
<td>Web conferencing</td>
<td>35</td>
</tr>
<tr>
<td>Ipod/MP3 player</td>
<td>33</td>
</tr>
<tr>
<td>Podcasts</td>
<td>31</td>
</tr>
<tr>
<td>Desktop computer</td>
<td>18</td>
</tr>
<tr>
<td>Online text or video chat</td>
<td>15</td>
</tr>
<tr>
<td>Social networking</td>
<td>10</td>
</tr>
</tbody>
</table>

Q25: Please select the one technology tool that you DO NOT currently use or have at your disposal that you believe would be most useful to support and enhance your program.

**Table 11: Instructor Responses**

<table>
<thead>
<tr>
<th>Technology</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portable computer</td>
<td>25</td>
</tr>
<tr>
<td>I have all the technology I need at my disposal</td>
<td>24</td>
</tr>
<tr>
<td>E-reader</td>
<td>19</td>
</tr>
<tr>
<td>Smartphone</td>
<td>19</td>
</tr>
<tr>
<td>Digital content</td>
<td>13</td>
</tr>
<tr>
<td>Web conferencing</td>
<td>10</td>
</tr>
<tr>
<td>Online text or video chat</td>
<td>9</td>
</tr>
<tr>
<td>Ipod/MP3 player</td>
<td>8</td>
</tr>
<tr>
<td>Podcasts</td>
<td>7</td>
</tr>
<tr>
<td>Social networking sites</td>
<td>3</td>
</tr>
<tr>
<td>Blogs</td>
<td>3</td>
</tr>
<tr>
<td>Desktop computer</td>
<td>1</td>
</tr>
</tbody>
</table>
Importance

By understanding the importance of certain technologies the College may be in a better position to ensure that relevant technologies are available to both students and instructors. The researcher attempted to reveal additional information on the importance of certain technologies through the following research question (RQ3): *From the perspective of students and instructors at Holland College, how important are certain technologies to the learning environment?*

Survey data pertaining to four different technologies was selected to show the importance of these technologies to the learning environment. Students and instructors were asked via the survey, to rate the level of importance of each technology on a 4-point Likert scale. Respondents could choose from: 1) ‘extremely’, 2) ‘somewhat’, 3) ‘not very’, or 4) ‘not at all’. Four students’ survey questions (6, 11, 13, and 16) and four instructors’ survey questions (12, 17, 18, and 21) were analyzed to determine the importance of certain technologies for learning. The number of occurrences for each response was determined and the percentages were calculated. These survey questions were formatted differently from the other survey questions. A question heading was provided that was not numbered. After the question heading the technologies followed. The student question and instructor question along with the specific questions analyzed are provided below.

<table>
<thead>
<tr>
<th>Student Question: How important is it that Holland College offers the following to students? Please answer extremely, somewhat, not very, or not at all under each of the following.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q6: Wireless, SQ11: Distance education, SQ13: Campus computer labs, Q16: Social networking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instructor Question: How important is it that Holland College offers the following to students? Please answer extremely, somewhat, not very, or not at all under each of the following.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q12: Wireless, Q17: Distance education, Q18: Campus computer labs, Q21: Social networking</td>
</tr>
</tbody>
</table>
**Wireless Access**

The first technology identified in the survey questions pertained to wireless network access. Students’ survey question 6 and instructor question 12 were analyzed. The majority of students, 335 (63 percent) selected ‘extremely’, 153 individuals or 29 percent of students selected ‘somewhat’, 37 students or seven percent selected ‘not very’, and eight students or two percent selected ‘not at all’. Of the 109 instructors, 69 respondents or 63 percent of the instructors selected ‘extremely’, 35 instructors or 32 percent selected ‘somewhat’. Four instructors, which is also four percent, selected ‘not very’, and one instructor, or one percent, selected ‘not at all’. A graphical representation of student and instructor responses is provided in Figure 3.

*Figure 3: Importance of Wireless Access*

**Distance Education**

Distance education, described as when students don’t meet face to face with instructors and other students, was the second technology analyzed (student Q11, instructor Q17) with
respect to RQ4. Of the 533 student respondents, 114 or 21 percent selected ‘extremely’. Two-hundred and five or 38 percent of student respondents selected ‘somewhat’. While 149 students, representing 28 percent of the sample selected ‘not very’ and 62 students or 12 percent selected ‘not at all’.

From the 109 instructor respondents, 29 individuals or 27 percent of the sample responded ‘extremely’. Fifty instructors (46 percent) responded ‘somewhat’, 18 instructors (17 percent) responded ‘not very’, and 11 instructors or ten percent responded ‘not at all’. Figure 4 is a graphical representation of students’ and instructors’ responses.

![Figure 4: Importance of Distance Education](image)

**Campus Computer Labs**

Campus computer labs consist of classroom space outfitted with ten to 20 computers. Computer labs are located across the different campuses. Students may access the computers on a first-come-first-serve basis. The importance of campus computer labs was the third analysis
drawn from students’ survey question 13 and instructors’ survey question 18. From the student participants, 413 (77 percent) selected ‘extremely’. Ninety-five students (18 percent) selected ‘somewhat’ while 22 students (4 percent) selected ‘not very’ and two or 0.4 percent selected ‘not at all’.

Of the 109 instructors, 94 respondents (86 percent) selected ‘extremely’. Fourteen instructors representing 13 percent of the sample selected ‘somewhat’. Only one or 0.9 percent of the instructor respondents selected ‘not very’, and no instructors selected ‘not at all’. A graphical representation of responses from students and instructors is provided in Figure 5.

Figure 5: Importance of Campus Computer Labs

Social Networking

The final technology analyzed with respect to RQ4 was social networking. Websites such as Facebook, Twitter, or LinkedIn are used for social networking. These sites allow individuals to connect with friends, family, co-workers, or fellow students. When first introduced, social networking was primarily for personal use but the sites have evolved to include larger
communities including work-related or student-related groups. Students’ survey question 16 and instructors’ survey question 21 pertained to social networking.

For this question, 147 students (28 percent) selected ‘extremely’. The next option ‘somewhat’ was selected by 209 students representing 39 percent of the sample. One-hundred and twenty-eight students or 24 percent selected ‘not very’ and 48 or nine percent selected ‘not at all’. The instructor survey results were as follows: 13 instructors or 12 percent selected ‘extremely’, 51 instructors or 47 percent selected ‘somewhat’, 31 or 28 percent selected ‘not very’ and 14 respondents or 13 percent selected ‘not at all’. The responses for both students and instructors are provided in Figure 7.

*Figure 6: Importance of Social Networking*

Challenges

In order to understand how to implement technologies and improve on the technologies used for learning the management saw value in trying to understand what challenges are perceived by the users. By uncovering the obstacles, management may be able to implement changes to address the issues and enhance the learning environment. Two students’ survey
questions and two instructors’ survey questions were analyzed to uncover the perceived challenges in an effort to answer the following research question (RQ4): *From the perspective of students and instructors, what are the biggest challenges with respect to technologies for learning and teaching at Holland College?*

Question 30 on the students’ survey and question 37 on the instructors’ survey asked participants to identify the top three challenges to classroom technology at Holland College. The students’ survey consisted of seven possible responses, while the instructor survey had nine choices. The additional instructor survey options included ‘lack of budget’ and ‘technology is fully integrated into classrooms, there are no obstacles’. Respondents were asked to choose from up to three responses; however some chose only one or two, while others did not respond at all to the question. In total, 1068 responses were provided from 533 student participants. From the instructors’ survey, 286 responses were provided from 109 instructors. Table 12 and 13 include the list of choices the respondents had to choose from, along with the number of respondents who selected each option. The percentage of responses is based on the size of each sample: 533 students and 109 instructors.

Students selected a ‘Lack of technical support, which means that technology does not always work’ a total of 256 times, representing 48 percent of respondents. The second most common choice ‘our classrooms are not outfitted with technology’ was selected 212 times, representing 40% of participants. Furthermore, 167 students (31 percent) selected the option that the College did not have adequate technology to support the students. The next option ‘technology is outdated’ was selected by 144 students or 27 percent of the sample. One-hundred and twenty-two students (23 percent) identified that instructors did not know how to use technology, while 79 student respondents which represented 15 percent reported that instructors
would not use the technology. Lastly, 88 students or 17 percent reported that technology was not useful to the course. The students’ survey question is restated below and the results presented in Table 12.

Student Q30: What is the biggest challenge to classroom technology at Holland College? Please select the top 3.

<table>
<thead>
<tr>
<th>Students: Biggest challenge to classroom technology</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of technical support, which means that technology does not always work</td>
<td>256</td>
<td>48</td>
</tr>
<tr>
<td>Our classrooms are not outfitted with technology</td>
<td>212</td>
<td>40</td>
</tr>
<tr>
<td>Holland College does not have enough technology to adequately serve students</td>
<td>167</td>
<td>31</td>
</tr>
<tr>
<td>Technology is outdated</td>
<td>144</td>
<td>27</td>
</tr>
<tr>
<td>My Learning Managers/Instructors don’t know how to use it</td>
<td>122</td>
<td>23</td>
</tr>
<tr>
<td>Technology isn’t useful to my course of study</td>
<td>88</td>
<td>17</td>
</tr>
<tr>
<td>My Learning Managers/Instructors won’t use it</td>
<td>79</td>
<td>15</td>
</tr>
</tbody>
</table>

From the instructors’ survey, 68 respondents or 62 percent reported classes were not outfitted properly with technology. Fifty instructors representing 46 percent of respondents reported that instructors didn’t know how to use the technology. The next option ‘lack of budget’ was selected by 43 respondents or 39 percent with 17 respondents or 16 percent reporting that instructors would not use the technology. Furthermore, 60 instructors (55 percent) reported the College does not have adequate technology to meet the student needs. While 24 respondents, or 22 percent, reported there was a lack of technical support which means the technology doesn’t always work. Eighteen respondents (17 percent) reported the technology is outdated and two instructors or two percent reported technology is not useful to the courses. Lastly, four
respondents or four percent reported technology is fully integrated and there are no obstacles. A restatement of the survey question is provided along with the results of the instructor responses in Table 13.

Instructor Q37: What is the biggest challenge to classroom technology at Holland College? Please select the top 3.

<table>
<thead>
<tr>
<th>Instructors: Biggest Challenge to classroom technology</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our classrooms are not outfitted with technology</td>
<td>68</td>
<td>62</td>
</tr>
<tr>
<td>Not enough technology to adequately serve students and instructors</td>
<td>60</td>
<td>55</td>
</tr>
<tr>
<td>Learning Managers/Instructors don’t know how to use it</td>
<td>50</td>
<td>46</td>
</tr>
<tr>
<td>Lack of budget</td>
<td>43</td>
<td>39</td>
</tr>
<tr>
<td>Lack of technical support, technology does not always work</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>Technology is outdated</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>Learning Managers/Instructors won’t use it</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Technology is fully integrated into classrooms, there are no obstacles</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Technology isn’t useful to the courses at Holland College</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

In both surveys, an open-ended question followed to obtain further insight and feedback concerning any barriers to technology at Holland College. Question 31 on the students’ survey and question 38 on the instructors’ survey asked participants to identify any barriers to technology use at Holland College. The responses were analyzed to determine the number of responses pertaining to challenges. Each response was read and grouped according to an appropriate theme. The themes arising from the analysis and the definitions used by the researcher are provided in Table 14.
Table 14: Challenges: Themes & Descriptions

<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless/Network Access</td>
<td>Limited, slow, or difficulties connecting to the Internet.</td>
</tr>
<tr>
<td>Technology is not available</td>
<td>Limited amount of technology available for use (i.e. computers or classroom technologies such as interactive whiteboards or projectors), lack of technology or limited space available to meet needs.</td>
</tr>
<tr>
<td>Technology doesn’t work</td>
<td>The technology used in the classroom does not function properly or is broken.</td>
</tr>
<tr>
<td>Technology is outdated</td>
<td>Technology is outdate and is not compatible with new programs, or is slower to operate.</td>
</tr>
<tr>
<td>Instructor Issues</td>
<td>The instructors do not know how to use the technology, or they do not want to use the technology. Instructors do not have the proper training or the time to incorporate the technology into the program.</td>
</tr>
<tr>
<td>Technology support/student support</td>
<td>The support systems are not in place to maintain the proper functioning of the technology. Instructors and students are not provided with adequate technology support from the College.</td>
</tr>
<tr>
<td>Budget</td>
<td>The financial resources are not available to allow for a technology rich learning environment.</td>
</tr>
<tr>
<td>Standards</td>
<td>There are no policies, procedures, or guidelines for technology use in programs.</td>
</tr>
</tbody>
</table>

The responses ranged from one word or short sentences to detailed and more thoughtful responses that included from three to five sentences and often touched on a number of themes. The individual responses may have encompassed to more than one theme and therefore may have been categorized in more than one theme. Some students and instructors in the sample opted not to respond, or did not provide relevant feedback specific to the barriers. Of the 533 students in the sample only 100 responded to survey question 31. Twenty-two responses were not analyzed as the responses were not applicable to technology challenges. The remaining 78 responses were analyzed for the key themes pertaining to challenges and barriers. From the instructors’ survey, 54 of the 109 study participants responded. All of the 54 responses were valid in describing challenges and barriers related to technology.

The results from the theme analysis were tabulated in order from most often cited to least cited. The number of respondents associated with each theme along with the percentage of
respondents is provided. Percentages were calculated based on the respondent sample for students of 78 and the respondent sample for instructors of 54. The student survey question is restated followed by the students’ theme results in Table 15. Subsequently, the instructor survey question is restated followed by the instructors’ theme results in Table 16.

**Table 15: Challenges – Student Themes**

<table>
<thead>
<tr>
<th>Challenges</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless/Network</td>
<td>36</td>
<td>46</td>
</tr>
<tr>
<td>Technology is not available</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>Technology doesn't work</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Technology is outdated</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Instructor issues</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Technology/Student Support</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

**Table 16: Challenges – Instructor Themes**

<table>
<thead>
<tr>
<th>Challenges</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor Issues</td>
<td>23</td>
<td>43</td>
</tr>
<tr>
<td>Technology is not available</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td>Technology is outdated</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>Technology doesn't work</td>
<td>9</td>
<td>17</td>
</tr>
<tr>
<td>Wireless/Network</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Technology/Student Support</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Budget</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Holland College Standards</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>

The most commonly cited challenge in the student responses was Wireless/Network, with 46 percent of students identifying this challenge. Wireless/Network only represented 15 percent of the instructor responses. The most commonly cited challenge for instructors was the
instructors themselves. Forty-three percent of respondents cited this challenge while only nine percent of students cited instructor issues as a challenge. The second most commonly cited challenge for both the students and the instructors was that technology was not available. The responses ranged from those that identified a limited amount of computers or classroom technologies such as interactive whiteboards or projectors as a challenge. To others that identified that there was limited space available to meet student and instructor technology needs.

Summary

Chapter 4 presented the results of the data analysis. Four research questions (RQ1, RQ2, RQ3, and RQ4) guided the analysis in determining the perceptions of students and instructors specific to benefits, use patterns, importance, and the challenges. A detailed description of the overall results pertaining to the four research questions was provided. To fully understand what the results mean, an interpretation is required.

Chapter 5 focuses on the interpretation of the results and findings for the stated research questions. Based on the interpretation, a series of recommendations are provided. The final Chapter includes an examination of the limitations of the study and recommendations for further research. A description of the dissemination and implementation of the study is provided along with an overall study conclusion.
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations will arise from the interpretation of the results presented in Chapter 4. Interpretations are based on the purpose of the study, which was to describe the perceptions of students and instructors at Holland College with regards to technologies used for learning. The results of the analyses may inform management of Holland College about the needs and expectations of the key stakeholder groups. The additional information might allow management to make informed decisions concerning the next steps for e-learning and technologies used at Holland College.

Chapter 1 provided an introduction to the research, described the problem, and presented the research questions that formed the basis of the study. To further appreciate the research concepts, Chapter 2 provided a summary of the literature pertaining to the broad topic of e-learning, and the specific topics of e-learning in post-secondary institutions. The third Chapter outlined the research method and included the research design, populations, sampling frame, data collection processes, and data analysis procedures.

In Chapter 4, the selection of statistical techniques outlined in the methodology, including summations, averages, and percentages, were used to describe the data analysis in a meaningful manner. Chapter 4 addressed the research questions through the analysis of the data. In Chapter 5, the interpretation of the results and findings of the study is presented. Finally, Chapter 5 concludes with recommendations and the identification of future research opportunities.

Interpretation of the Results

The methodology outlined in the study provided the guidelines for the collection and analysis of secondary data leading to the results and findings of the study as presented in Chapter
4. The results arising from the data analysis enables the formulation of conclusions related to the study purpose and the stated research questions. The following sections include a summary of the results of the study and provide interpretations of the findings from the statistical and themed analyses of students’ and instructors’ perceptions at Holland College as of December, 2010.

The purpose of the research was to describe both the students and instructors perceptions of e-learning at a point in time. However, in consideration of the potential for repetition, in Chapter 5 the results from the samples will be reported and summarized together under the appropriate research question. Comparisons may be made to enhance the interpretation of the results and findings or to identify discrepancies between the students’ and instructors’ perceptions. The interpretation of the results will help to explain the perceptions and may allow management at the College to make informed decisions with regards to e-learning. The findings may provide the backdrop from which management of Holland College can create a needs-based e-learning plan.

Findings and Interpretations for RQ1

From the perspectives of students and instructors at Holland College, what are the benefits of a technology-rich learning environment?

The first research question focused on benefits associated with a technology-rich learning environment. The benefits identified by the students and instructors of Holland College were categorized under the benefit themes noted in the research conducted by the Canadian Council of Learning (2009). The primary benefit noted by both the students and instructors at Holland College was that technology allowed students to achieve academic success. As this was a significant benefit identified by both groups, academic achievement should be considered a key objective for any e-learning strategy implemented by the College. Accessibility and flexibility
was the second most commonly identified benefit of e-learning cited by both the students and instructors, which correlates with research conducted by Young (2006). Although, not the most cited benefit, accessibility and flexibility was of obvious significance to both populations and should be considered another key objective for an e-learning strategy. The majority of respondents are enrolled in part-time or full-time post-secondary traditional programs. This may explain the slightly lower response rates for accessibility and flexibility, as these students are available to attend classes during the traditional Monday-Friday, 9-5 work week.

Instructors considered collaboration and communication as an equally important benefit as accessibility and flexibility, although it was not as significant to the student population. The differences in responses may be accounted for in the various roles of students and instructors. The instructors would be considering e-learning from a pedagogical standpoint, where communication and collaboration is vital to program implementation. The students would be looking at e-learning from a learner perspective and may not recognize the impact of communication and collaboration on successful learning outcomes.

Students considered societal demands as being more significant than collaboration and communication, when it came to e-learning, while it was slightly less significant for instructors. Both students and instructors appear to realize the importance of technology skills for students’ future employment, but not as the primary benefit of e-learning. The lower amount of responses for this theme may be due to the fact that the additional technology skills are more of a secondary benefit of technologies used for learning. Students appear to be using technology for the primary purpose of learning the program content and gaining technology skills as a secondary benefit.
Most of the students and instructors who responded were involved in traditional face-to-face programming and very few identified remote learning as a benefit of technologies used for learning. While not recognized as a major benefit, remote learning initiatives at the College allow for the expansion into new markets. The competition among post-secondary institutions will continue to increase as will the amount of online learning materials available to learners. With that in mind, the benefits of remote learning may become realized over time, as access and uptake on online learning increases both at Holland College and globally.

The students’ and instructors’ perceived benefits of technologies for learning provided information that was previously unavailable to management of Holland College. Understanding the perceived benefits may help explain why students and instructors use technologies for learning. The additional information may provide a foundation from which to base the College’s e-learning strategies. By creating a strategy founded on the benefits identified by the students and instructors, management could strengthen and enhance the e-learning environment at Holland College.

*Findings and Interpretations for RQ2*

_From the perspectives of students and instructors at Holland College, how is technology used in the learning environment?_

Research question two (RQ2) focused on the use patterns of the students and instructors with respect to various technologies associated with e-learning. Survey data were analyzed to determine the following: 1) What technologies respondents used most often for learning, 2) How often technology is used for learning, 3) How often alternative technologies such as virtual learning or e-books are used, and 4) what technologies are underutilized. By analyzing these questions the study researcher sought to provide a picture of the technological skill, capacity, and
access to technology of the students and instructors. The intent of this research question was to inform management about the technologies employed to support and enhance learning. Furthermore, the additional information may potentially guide and support technology investment decisions.

Study findings revealed that most students and instructors are already using technology every day, or at least once a week, for learning and instruction. This means the students and instructors are exposed to technologies and are incorporating technologies into the educational process. In order to use technology on a daily or weekly basis for education the students and instructors must already have a certain level of technological skill. Technologies could likely be further incorporated into Holland College programs without much resistance as the majority of students and instructors are already using technology regularly for education. The students and instructors appear to have a high propensity to use technology for learning and are aware of the technologies available. As such, management may want to focus on ways to further incorporate technologies into programs rather than on awareness.

Identifying the technologies used most often for learning was important. As the results could help management understand where technological investments could be made. Study results revealed that students reported using the campus computer labs most often for learning and instructors reporting using desktop computers most often. Portable technologies were the second most cited technology used for learning by students, revealing that many students have access to their own computer technologies. However, the fact that the wireless connection is a technological challenge within the College could be a reason why students are more reliant on the campus computer labs than personal portable computers. Despite whether a computer is portable or stationary, most student and instructor respondents identified the actual computer
hardware as the most used technology for learning. Furthermore, the literature suggested that as institutions become reliant on technologies, a requirement to provide students with the necessary technologies for learning (Carpenter, 2010) may be deemed necessary. Eventually, the College may need to consider providing a desktop, portable, or mobile computing device to each student.

The third most cited technology by students, and second most cited technology by instructors, was SAM, Holland College’s learning management system. SAM is the software application used to connect students and instructors, and provides the platform for e-learning within the College. Both students and instructors appear to use the applications of SAM, however, it may be possible that SAM could be used to a greater extent by both students and instructors, especially if the software was accessible off campus and within the campus computer labs, as well as on portable or mobile devices. The third most cited technology by instructors was digital content. As instructors are developing the courses, the use of digital content may be used to supplement and enhance classroom training.

In an effort to extend the knowledge of alternative technology use patterns, survey questions were asked in regards to use patterns of virtual learning and e-books. Neither technology is incorporated into programs to any great capacity within the College. However, based on the industry trends identified in the literature (Johnson et al., 2010), both technologies were deemed worthy of consideration, as both appeared to be rising in use and acceptance.

Most students had not participated in virtual learning and most instructors did not offer virtual learning in classes. As Holland College programs are primarily offered in a face-to-face context, the low use of virtual learning was not unexpected. However, determining if students would prefer to have more virtual learning incorporated into classes, or if they plan to do some
type of virtual learning in the future could provide additional insight not obtained from this study.

The next technology considered was electronic books (e-books). The level of use of e-books was quite low, at only 16% for students and 18% for instructors. Based on the results, the majority of students and instructors have not yet incorporated e-books fully into programs. The findings on e-books may be on track with the trends identified in the 2010 Horizon Report (Johnson et al., 2010) stating e-books will likely not be fully integrated into the post-secondary education system for another 2-3 years. While this may be the case, the College could begin to proactively integrate e-books into the library and curriculum system sooner rather than later.

In order to use e-books, students and instructors require access to e-book technologies. Desktop, portable, and mobile computing devices can be used to access e-books. However, the newest e-book technologies are e-reader devices such as the Kindle. As such, e-readers were identified as the most underutilized technology for learning by both students and instructors. The question may have been somewhat leading as this technology was the most recently developed and therefore would obviously be the least readily available to survey respondents. Even so, the results revealed students and instructors do not have widespread access to e-readers which could also explain the low reported usage of e-books.

*Findings and Interpretations for RQ3*

*From the perspective of students and instructors at Holland College, how important are certain technologies to the learning environment?*

Research question three (RQ3) asked respondents to rate the level of importance of certain technologies for learning. By understanding which technologies are perceived as important, management at the College may be in a position to ensure the important technologies
are available and functioning properly. While students and instructors may use technologies regularly, additional value can be achieved through an understanding of how important the technologies are for learning.

Seventy-seven percent of students and 86 percent of instructors reported that campus computer labs were extremely important for learning and wireless access was identified as extremely important by 63 percent of the students and 69 percent of the instructors. While both groups rated campus computer labs and wireless access as being extremely important for learning, the respondents were not asked to explain why these technologies were important to learning. The College should consider incorporating sufficient computer labs and wireless network technology into the e-learning and technology strategy.

To fully comprehend student and instructor feedback related to virtual learning, respondents were also asked to rate the importance of distance education. Thirty-eight percent of students and 46 percent of instructors rated distance learning as only somewhat important. Distance learning was not identified as extremely important for learning at the particular point in time the study was conducted. However, the importance may increase over subsequent years as the applications of distance learning become more widespread. Further research into whether students would prefer distance learning if it was more readily available could also provide valuable insight to management.

The final technology examined for importance was social networking. Twenty-eight percent of students considered social networking extremely important for learning and 39 percent of students considered it somewhat important. Conversely, only 12 percent of instructors considered social networking extremely important for learning while 47 percent of instructors considered social networking somewhat important for learning. As 67 percent of the students
identified social networking as either extremely or somewhat important to learning a communication plan that uses the technology could be incorporated as a method to connect with students.

*Findings and Interpretations for RQ4*

*From the perspective of students and instructors, what are the biggest challenges with respect to technologies for learning and teaching at Holland College?*

The intent of research question four was to identify the challenges to technologies used for learning at Holland College. The challenges are those obstacles that can stand in the way of a technology, a curriculum plan, or a strategy for e-learning. In order for management to respond appropriately to challenges it is necessary to firstly identify challenges from the users’ perspective. Students and instructors may be experiencing challenges about which the management is unaware.

Students identified a lack of technical support as a primary challenge at Holland College. Technical support is required to ensure the technologies at the college function properly. Additional challenges included: classrooms were not outfitted properly and an inadequate amount of technology was available to meet student needs. When asked to provide open-text comments pertaining to challenges, the students reported wireless network as a major challenge to the technologies for learning at Holland College.

The College has wireless network connections available on a limited basis throughout the campuses. Students expressed frustration with the inability to access Internet content while on campus. Given the widespread adoption of the Internet within households and businesses, wireless access is often an expected technology and even more so within the College environment. If the College is not able to provide wireless network connection so that students
can use computing devises, then further investment for additional campus computers to meet the students’ needs may be required.

Instructors identified classroom technologies and an inadequate availability of technology to meet the needs of students as two challenges. Unlike students, instructors identified lack of technology skill and knowledge on the part of the instructors as an additional challenge. When instructors were asked to provide open-text comments on challenges a lack of time, resources, and training of instructors were identified as primary causes of instructor issues with technology implementation. Instructors appear to be taking responsibility for the lack of technology used for learning. Management may want to consider how instructors can be supported in order to better implement and utilize technologies.

Identifying the challenges was important, as management may now be in a position to respond to the concerns identified by students and instructors. The challenges identified by both students and instructors were more technological in nature. Until these technology issues are addressed, the College may have difficulties moving forward with any technologies for learning. Technological limitations could limit the success of any e-learning initiatives. Until Holland College corrects the problems the e-learning strategy may not be in a position to flourish.

Access to computer technologies was another challenge and management should determine ways to ensure students have the adequate means to complete assignments and communicate with instructors. As noted in the literature, post-secondary institutions may soon be required to provide continuous access to technologies as part of the learning environment (Carpenter, 2010).
Recommendations for Holland College Management

Recommendations based on the results and interpretations of the study might help management of Holland College address e-learning and technology in a proactive manner. The recommendations include possible actions and policies that management may employ to address specific issues identified in the study. Based on the results, a number of recommendations for the management have been made.

1. Upgrade the technologies on campuses, including wireless network connections and campus computers available to students to address the technological challenges identified by both students and instructors.

2. Support existing technologies and technology upgrades in order to respond to challenges identified by students. Also, consider hiring additional IT support staff specifically for student-oriented technology support.

3. Acknowledge the importance of e-learning at Holland College by creating an overall e-learning plan with clearly defined goals. The strategic goals could be to a) use e-learning to increase academic achievement of students, b) provide industry with a workforce that has the appropriate technology skills to compete in the new knowledge-based economy, and c) use e-learning initiatives to provide instructors with a creative, supportive and innovative work environment.

4. Develop different e-learning plans for the different student sub-populations. Three different sub-populations of students exist at Holland College. Each sub-population should be examined in isolation to determine the actual needs and expectations associated with the particular group. The sub-populations have diverse program structures and
students with varying needs. As such, specific strategies for each sub-population could potentially be more effective than a general e-learning approach for all students.

5. Extend the e-learning plan to the program and even course level. State clearly defined minimum e-learning and technology requirements for each program and course. This will ensure all programs have some level of e-learning incorporated into the training.

6. Develop an inventory of Holland College programs and courses to fully understand the amount of e-learning components offered. This will also help in defining the minimum requirements to implement at the course and program levels.

7. Consider and evaluate additional distance learning opportunities. Currently these programs are managed under the full-time and part-time post-secondary sub-population; however the needs of a distance learner can be much different to that of an on-campus student. Distance learning programs could be designed to maintain connections with students after graduating from Holland College.

8. Create an e-learning unit within curriculum services. The unit should include additional staff to support and develop programming that is useable by the instructors. The additional staff could allow for additional training and professional development for instructors as well as course design.

9. Consult with the management of JKN with regards to e-learning implementation and development processes. Use the existing knowledge and processes to inform the development of an e-learning unit and support the process.

10. Maintain the momentum created by this study through more rigorous and frequent assessments to supplement the perceptions data obtained. Collect continuous information
about students’ and instructors’ perceptions of e-learning on a longitudinal basis to track progress, identify and predict changing trends, and address challenges expediently.

11. Re-evaluate the survey tool used to gather the data and methods used in the study.

Continually improve the process and create a more succinct method for evaluating the perceptions. Consider supplementing the data with qualitative long interviews or focus groups in an effort to explain the perceptions in more detail.

Limitations

Limitations are potential problems or possible areas of weaknesses of the study (Creswell, 2002). Limitations exist in most all research. Identifying limitations is important for isolating inherent issues that may be addressed in future studies. Identification of the limitations allows the researcher to consider additional approaches to illicit further feedback from students and instructors to help increase the reliability of the study or future studies (Leedy & Ormrod, 2005). The following section identifies the limitations associated with the study. The additional approaches may allow for the alleviation of some originally observed limitations. The limitations identified may be used to guide further research.

- The study was confined to the population of students and instructors at Holland College in December, 2010.

- The study did not consider the perceptions of the students and instructors located at Holland College affiliate campuses in China.

- The study was limited to students and instructors who volunteered to participate in the surveys.
• The College has Language Training, Adult Education & GED programs. Many students within these populations may have had low literacy and computer skills. These factors could limit the response rates of these groups.

• Errors may be inherent when using a survey completed by students in the sample; some students may not have the ability to comprehend the questions in the survey instrument.

• Students and instructors with low computer skills may have been less apt to complete the survey.

• Instructors are in a position to speculate on what students may want or need with regards to technologies for learning because instructors receive direct feedback from students on a regular basis.

• The programs of study were categorized as per the formal programs list on the Holland College website. The students and instructors responses were limited to these programs. It did not take into consideration alternate names that may be more identifiable to students.

• The amount of time available to conduct the study and the timeliness of the data collected presented limitations based on the specified timelines of the management.

• The validity of the study was limited to the degree to which the participants followed the instructions for the surveys.

• Limitations resulted from the use of secondary data collected by the Holland College in accordance with the standards applied by the College officials.

• The validity was limited to the reliability of the instrument used.
Survey research relied on self-reported data and the honesty of the respondents. Data included self-reported demographic characteristics and perceptions that may have been limited by distorted memories, attitudes, biased recollections based upon recent events or current contexts, or a misrepresentation of the facts.

The students and instructors had already been surveyed for other purposes, in the same month. Possibly limiting the response rates as respondents were not willing to complete another survey.

Recommendations for Further Research

Although the study fulfilled the stated purpose, opportunities exist for additional research that would build on the results of this study. Further study may enhance management’s understanding of the e-learning needs of students and instructors. The following section will describe opportunities for further study stemming from the results identified in Chapter 4.

The results of the study indicated students’ and instructors’ perceptions of technologies used for learning within Holland College at a specific point in time. A research initiative to measure and track students’ and instructors’ feedback throughout the Holland College experience may be worthwhile. Future research may provide valuable information about the types of support students and instructors need for e-learning and technology as the population changes and the technologies evolve.

Further research may be required into the actual needs and technology skill levels of each sub-population. Separation of students by the programs, including distance learners, may be beneficial to understanding the needs of each distinct program group. The results of the study may motivate management to seek further research regarding policy decisions on e-learning. An
expansion of the results from this study information could provide insight into the following areas, (a) What are the perceptions of high school students in the target market with regards to e-learning and distance education course? (b) What are the perceptions of the other stakeholders involved in e-learning, including the suppliers/content providers, accreditation bodies, and employers? (c) What are the perceptions of students and instructors on a longitudinal basis? (d) Would qualitative long interviews with a sample of students and instructors provide more insight into the current findings?

The results of the study were specific to the experiences of students and instructors at Holland College. A study to determine whether similar relationships exist at post-secondary educational institutions in other jurisdictions may help validate the study results. If studies asked similar research questions but focused on institutions in other jurisdictions (privately or institutionally operated) results may enable education officials to make meaningful comparisons that would help inform the research community. Another possible area for further study might include the examination of the various types of innovative programs and instructional strategies for e-learning at other Colleges across Canada and perhaps at a global level.

Summary

Chapter 5 interpreted and identified specific ways the study results can be used to inform management at Holland College with respect to the specific actions needed to address issues highlighted by the study. Recommendations for further research arising from the study were provided. Dissemination of information from the study could increase awareness among management of Holland College with regards to technologies for learning. Management may
then focus on finding new approaches, mechanisms, resources, or strategies to address e-learning and technology needs of the key stakeholder groups.

Dissemination and Implementation

The dissemination of study results to the Holland College management team may help inform policy discussions related to e-learning and technology requirements. First, the research project will be reviewed by a Holland College management representative and copies of the final report will be provided to the Vice President of Holland College. Second, the Holland College E-learning Advisory Committee and IT Policy Committee will be provided with a written summary of the findings and recommendations.

A formal public presentation as part of the UPEI MBA program will be employed as the third dissemination vehicle. Six months, after the UPEI presentation, the research project will be made available via the UPEI library. The delay was requested by the researcher in order to protect any competitive information in the study pertaining to Holland College.

Conclusion

Technological advances are having a dramatic impact on society. People are now using hand-held portable or mobile devices on a daily basis, both for personal and professional purposes. Global technology changes are having a significant impact on educational institutions. Holland College should remain abreast of the trends so as to ensure students have appropriate technological skills when entering the workforce. In an effort to protect the current market and maintain competitiveness the College should consider e-learning as an alternative that could support and enhance traditional education.
In order to expand e-learning, the management of the College recognized the need for an e-learning strategy. However, before an e-learning plan could be developed a detailed evaluation of the key stakeholder needs and expectations was required. In order to do so, the College surveyed students and instructors to determine the perceptions surrounding technologies used for learning at the College. The study provided insight into the perceived benefits, use patterns, importance, and challenges at Holland College as of December, 2010. Management of Holland College requested the information so as to be in a position to make evidence-based decisions regarding e-learning and technology investments. Furthermore, the study results provided information previously absent from the Holland College data archives. The data results and analyses led to a series of recommendations for consideration.

The primary purpose of the study was to generate the data concerning students’ and instructors’ perceptions of technologies for learning to inform management. An indirect benefit of the study was that students and instructors were provided with an opportunity to offer an opinion. The process may have created a collaborative and fully inclusive environment where key stakeholder input was considered critical to the creation of a technology and e-learning strategy at Holland College.
REFERENCES


lived up to its initial projections for penetrating the corporate environment. (Chapter 2).


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Chesapeake, VA: AACE. Available at: http://www.editlib.org/p/26487


APPENDIX A: NON-DISCLOSURE AGREEMENT

Department of Applied Research, Holland College

NON-DISCLOSURE AGREEMENT

This Agreement is made effective as of: January 21, 2011

This Non-Disclosure Agreement ("Agreement") is entered into by Krystine Richards ("Employee/Consultant")

DEFINITIONS

"CONFIDENTIAL INFORMATION" means any and all information belonging to the College or to which the College has rights, which is of value to the College in the course of conducting its business or the disclosure of which would result in a disadvantage to the College. Confidential Information may include, without limitation, information about customers, pricing strategies, prices obtained from suppliers; employee lists or names of individual employees; financial information; inventions, improvements and other intellectual property; trade secrets; College-related know-how; designs, processes or formulae; materials or apparatus; methods; ways of business; research and development data, results or products; software or programs; market or sales information or plans; customer lists; and business plans, prospects and opportunities (such as possible acquisitions or dispositions of business) which have been discussed or considered by the management of the College. Information developed by the Employee/Consultant pursuant to the Employee’s/Consultant’s employment/contract by the College is Confidential Information of the College. Confidential Information also includes the confidential information of others with which the College has a business relationship.

"COLLEGE-RELATED INVENTIONS OR DEVELOPMENTS" means all inventions, developments, creative works or useful ideas created by Employee/Consultant alone or with others, whether or not patentable and whether or not further development may take place after Employee’s/Consultant’s employment/contract, which either (i) relate when made to the past or present business or research and development activities of the College; (ii) relate to any work performed for the College, whether or not they are made during normal business hours; or (iii) are made through the use of Confidential Information, or the College’s equipment, software, or other facilities or resources.

TERMS AND CONDITIONS

CONFIDENTIALITY The Employee’s/Consultant’s employment/contract creates a relationship of confidence between the Employee/Consultant and the College. The Employee/Consultant agrees that, during and following his or her employment/contract with the College, the Employee/Consultant will not disclose or communicate any Confidential Information with or to anyone, and will not use any Confidential Information for the benefit of Employee/Consultant or any person or entity other than the College. Information not specifically known to be in the public domain is considered confidential until otherwise specified by the College. The Employee/Consultant will deliver immediately to the College all copies of any Confidential Information upon the College’s request and/or upon the
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<th>ASSIGNMENT OF COLLEGE-RELATED INVENTIONS OR DEVELOPMENTS</th>
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<td>Unless otherwise specified in a contract or other binding document, all College-Related Inventions or Developments will be the sole property of the College. The College will be the sole owner of all patents, copyrights and other proprietary rights in and with respect to all College-Related Inventions or Developments. The Employee/Consultant hereby transfers and assigns to the College all proprietary rights which he or she may have or acquire in any College-Related Inventions or Developments, and he or she waives any other special rights including, without limitation, moral rights, which he or she may have or accrue in College-Related Inventions or Developments. Employee/Consultant will execute any documents and take any actions that may be required to effect and confirm such transfer, assignment, and waiver. The Employee/Consultant agrees to promptly disclose to the College all College-Related Inventions or Developments.</td>
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<td>a) This Agreement shall be governed by and construed under the laws of Prince Edward Island, Canada.</td>
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<tr>
<td>b) The Employee’s/Consultant’s obligations under this Agreement shall survive the termination of his or her employment/contract for whatever reason.</td>
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<tr>
<td>c) The Employee’s/Consultant’s rights and obligations under this Agreement may not be assigned by Employee/Consultant to any other party.</td>
</tr>
<tr>
<td>d) This Agreement may not be amended, rescinded, superseded, or canceled except by a written instrument signed by Employee/Consultant and the College. No terms of this Agreement may be waived except by a written instrument signed by the party waiving compliance.</td>
</tr>
<tr>
<td>e) This Agreement constitutes the entire agreement between the parties with respect to the matters addressed in this Agreement and supersedes all prior agreements between the parties concerning such matters.</td>
</tr>
<tr>
<td>f) The Employee’s/Consultant’s signature below indicates his understanding and acceptance of this Agreement and acknowledgment that nothing contained in this Agreement shall be deemed to alter or modify the at-will nature of his or her employment/contract with the College.</td>
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| **ADDITIONAL DETAILS** | 1) Copies of raw data will be destroyed by July 31, 2011.  
2) Use of data must remain compliant with Holland College REB approval. Including:  
   a) Reports based upon data analysis must be made at the aggregate level to ensure confidentiality of participants.  
   b) Any quotes from “open ended” questions must be made in a manner that ensures confidentiality of participant(s).  
3) Data and reporting on the data must be used solely for the stated educational purpose of producing a “Signature Project” as outlined in the program of study at UPEI.  
4) Data and reporting are not to be used for any other purpose without express written permission from Holland College. |

| **EMPLOYEE/CONSULTANT/NAME:** |
| **SIGNATURE:** | **DATE:** |
APPENDIX B: CDW-G SURVEY TEMPLATES

2010 CDW-G 21st-Century Campus Assessment Tool

Survey Instruments Students:
In an ongoing effort to improve our service, support and commitment to your education, we would appreciate your participation in the following survey. This survey is designed to summarize our current technology program and provide information we can use to shape the future direction of technology on our campus. The survey should take approximately 10 minutes to complete and is for college students only. Individual responses are confidential, and results will only be reported in aggregate. Thank you in advance for your time and honest feedback.

1. What is your class standing?
   a) Freshman
   b) Sophomore
   c) Junior
   d) Senior

2. Consider for a moment the classroom technology, including computer equipment and access to that equipment that you used in high school. How does it compare to the classroom technology on your campus?
   a) The classroom technology on my campus is significantly better than my technology in high school
   b) The classroom technology on my campus is slightly better than my technology in high school
   c) The classroom technology on my campus is about the same as my technology in high school
   d) The classroom technology on my campus is slightly worse than my technology in high school
   e) The classroom technology on my campus is significantly worse than my technology in high school

3. When you were considering where to attend college, how important was an institution’s technology offerings to students, including equipment and access to that equipment, in your selection process?
   a) Extremely important
   b) Somewhat important
   c) Neutral
   d) Not very important
   e) Not at all important

4. How important is it that your college offers the following to students? Please answer extremely,”“somewhat,”“neutral,”“not very” or “not at all” next to each answer option in the blank space to the left.
   a) Wireless network
   b) Laptop computer
   c) Tablet computer
   d) Desktop computer
   e) Netbook computer
   f) iPad
   g) Smartphone (e.g., BlackBerry, Droid, iPhone)
   h) E-reader device (e.g., Kindle, Sony Reader)
   i) Course management system (e.g., Blackboard, Jenzabar, Moodle, Web CT)
   j) Digital content (e.g., online textbooks and material available online for download, including PDF documents, notes and other curricular materials in electronic form)
   k) Interactive whiteboard
   l) Student response systems (a.k.a. “clickers” or learning response systems)
   m) Accessing the campus’ network from an off-campus location
   n) Recorded class lectures to watch on your own time
   o) Virtual learning, which delivers education to students who are not physically in the same location as the teacher and/or other students
p) Campus computer lab
q) Multimedia content streaming

5. Does your college offer the following to students? Please answer “yes,” “no” or “don’t know” next to each answer option in the blank space to the left.
a) Wireless network
b) Laptop computer
c) Tablet computer
d) Desktop computer
e) Netbook computer
f) iPad
g) Smartphone (e.g., BlackBerry, Droid, iPhone)
h) E-reader device (e.g., Kindle, Sony Reader)
i) Course management system (e.g., Blackboard, Jenzabar, Moodle, Web CT)
j) Digital content (e.g., online textbooks and material available online for download, including PDF documents, notes and other curricular materials in electronic form)
k) Interactive whiteboard
l) Student response systems (a.k.a. “clickers” or learning response systems)
m) Accessing the campus’ network from an off-campus location
n) Recorded class lectures to watch on your own time
o) Virtual learning, which delivers education to students who are not physically in the same location as the teacher and/or other students
p) Campus computer lab
q) Multimedia content streaming

6. How important is technology to your ability to study for your major and/or prepare for your chosen profession?
a) Very important
b) Important
c) Somewhat important
d) Not important

7. How would/does having a technology-rich classroom/learning environment change the way you learn? (Open Ended)

8. What is your vision for how students should use technology in college? (Open Ended)

9. To what extent is the technology provided by your college integrated into your classes? Please rate on a scale of one to five, where one is not at all integrated and five is fully integrated.
1  2  3  4  5

10. Please indicate how strongly you agree or disagree with the following statement: My college/university understands how I use or want to use technology as a learning tool.
a) Strongly agree
b) Agree
c) Neutral
d) Disagree
e) Strongly disagree

11. Please indicate how strongly you agree or disagree with the following statement: My college/university is preparing me to successfully use technology as a business/professional tool when I enter the workforce.
a) Strongly agree
b) Agree
c) Neutral
12. Looking ahead, which of the following professional technology skills will be most important to your success in the workforce? Please select the top three skills you believe will be most important.
   a) E-mail composition
   b) Technical writing
   c) Presentation development
   d) Audio, video and/or multimedia content development
   e) Graphic development
   f) Spreadsheet development
   g) Web site development
   h) Web content management (e.g., HTML documents, images and other forms of media)
   i) Computer programming
   j) Online news and database research
   k) Understanding industry-specific software programs
   l) Other, please specify: _______________________

13. Virtual learning delivers education to students regardless of where the professor and/or other students are located. Examples of virtual learning include, but are not limited to, online classes, distance learning, professors bringing in guest speakers through video conferencing and collaboration with professors and students in other locations. Have you ever taken a class that offers virtual learning?
   a) Yes
   b) No

14. What are the benefits of virtual or distance learning? Please select all that apply.
   a) I do not see benefits of virtual learning/I do not want to take a virtual learning class
   b) Virtual learning gives me the opportunity to study with a broader variety of faculty members
   c) Virtual learning enables me to interact with a greater number of fellow students
   d) Virtual learning increases the variety of classes I can take
   e) Virtual learning provides the opportunity for professional adults to take classes while working full time
   f) Other, please specify: ___________________________

15. On average, how do your professors feel about using technology as a learning tool?
   a) Professors understand technology, and it is fully integrated into my classes
   b) Professors believe that technology can be a useful tool, and they encourage students to use it
   c) Professors treat technology as optional for their classes
   d) Professors do not understand technology and do not use it

16. What is the biggest challenge to classroom technology on your campus? Please select one.
   a) My professors don’t know how to use it
   b) My professors won’t use it
   c) My campus does not have enough technology to adequately serve students
   d) Our classrooms are not outfitted with technology
   e) Lack of technical support, which means that technology does not always work
   f) Technology isn’t useful to my course of study
   g) Technology is outdated
   h) Technology is fully integrated into my curriculum – there are no obstacles
   i) Other, please specify: ___________________________

17. Which of the following technologies/Internet tools do you currently use in conjunction with your education (e.g., to study, while in class, to work on projects)? Please select all that apply.
   a) Laptop computer
   b) Tablet computer
   c) Netbook computer
   d) Desktop computer
   e) iPad
   f) iPod/MP3 player
   g) E-reader device (e.g., Kindle, Sony Reader)
   h) Digital video recorder (e.g., Flip)
i) Smartphone (e.g., BlackBerry, Droid, iPhone)
j) Videoconferencing
k) Web conferencing
l) Online text or video chat
m) Course management system (e.g., Blackboard, Jenzabar, Moodle, Web CT)
n) Digital content (e.g., online textbooks and material available online for download, including PDF documents, notes and other curricular materials in electronic form)
o) Interactive whiteboards
p) Student response systems (a.k.a. “clickers” or learning response systems)
q) Open source applications (e.g., Google Apps, OpenOffice)
r) Social networking sites (e.g., Facebook, Twitter, Google Buzz, LinkedIn, MySpace)
s) Blogs
t) Wikis
u) Podcasts/vodcasts
v) Other, please specify: _____________________________

18. Which of the following technologies/Internet tools do you currently use for personal use (e.g., to connect with friends/family or for hobbies, extracurricular activities and relaxation)? Please select all that apply.
a) Laptop computer
b) Tablet computer
c) Netbook computer
d) Desktop computer
e) iPad
f) iPod/MP3 player
g) E-reader device (e.g., Kindle, Sony Reader)
h) Digital video recorder (e.g., Flip)
i) Smartphone (e.g., BlackBerry, Droid, iPhone)
j) Videoconferencing
k) Web conferencing
l) Digital content (e.g., online books and material available online for download in electronic form)
m) Online text or video chat
n) Open source applications (e.g., Google Apps, OpenOffice)
o) Social networking sites (e.g., Facebook, Twitter, Google Buzz, LinkedIn, MySpace)
p) Blogs
q) Wikis
r) Podcasts/vodcasts
s) Other, please specify: _____________________________

19. Please select the one technology tool that you do not currently use or have at your disposal, that you most want and believe would be most useful in your studies.
a) Laptop computer
b) Tablet computer
c) Netbook computer
d) Desktop computer
e) iPad
f) iPod/MP3 player
g) E-reader device (e.g., Kindle, Sony Reader)
h) Digital video recorder (e.g., Flip)
i) Smartphone (e.g., BlackBerry, Droid, iPhone)
j) Videoconferencing
k) Web conferencing
l) Online text or video chat
m) Course management system (e.g., Blackboard, Jenzabar, Moodle, Web CT)
n) Digital content (e.g., online textbooks and material available online for download, including PDF documents, notes and other curricular materials in electronic form)
o) Interactive whiteboards
p) Student response systems (a.k.a. “clickers” or learning response systems)
q) Open source applications (e.g., Google Apps, OpenOffice)
r) Social networking sites (e.g., Facebook, Twitter, Google Buzz, LinkedIn, MySpace)
s) Blogs
t) Wikis
u) Podcasts/vodcasts
v) Other, please specify: ______________________________

20. Social media uses mobile and Web-based communications platforms to enable real-time dialogue and content sharing. Examples of social media tools include the following: Facebook, Twitter, blogs and wikis. How often do you use social media to study or work on class assignments?
a) Every day 
b) Several times a week 
c) Several times a month 
d) Rarely 
e) Never

21. How often do you use social media to connect with classmates to study or work on class assignments?
a) Every day 
b) Several times a week 
c) Several times a month 
d) Rarely 
e) Never

22. How often do you use social media to connect with faculty to study or work on class assignments?
a) Every day 
b) Several times a week 
c) Several times a month 
d) Rarely 
e) Never

23. How often do you use technology as a learning tool while in class?
a) Every day 
b) Most classes 
c) Several times throughout the semester 
d) Rarely 
e) Never

24. Outside of class, how do you prefer to communicate with your professors? Please select your top three methods of communication.
a) In-person 
b) Phone 
c) E-mail 
d) Instant message 
e) Facebook 
f) Twitter 
g) Course management tools (e.g., Blackboard, Jenzabar, Moodle, Web CT) 
h) Web-based video chat (e.g., Skype, Microsoft OCS) 
i) I do not communicate with teachers outside of classes 
j) Other, please specify: _____________________________

25. Some institutions are considering digital/online textbooks/e-text as an alternative to traditional print textbooks. Textbooks are delivered via a laptop, netbook or e-reader device. What benefits, if any, do you see for you and your campus from such a move? Please select all that apply.
a) Instant access to content 
b) Increased student engagement 
c) Cost savings for students 
d) Ease of note taking 
e) Do not see any benefits 
f) Other, please specify: _____________________________
26. What challenges do you see for your campus and students by moving to digital/online textbooks/e-text? Please select all that apply.
   a) Availability of, or access to, digital or online textbooks
   b) Availability of, or access to, a digital content reader or computing device
   c) Affordability of digital textbook device
   d) Faculty reluctance to move to digital or online textbooks
   e) Some students prefer print material
   f) Lack of understanding of the benefits of digital or online textbooks
   g) I do not want to use digital/online textbooks/e-text
   h) There are no challenges to moving to digital or online textbooks
   i) Other, please specify: _____________________________

27. What recommendations would you give to your professors to better use technology in the classroom, including digital content, online textbooks, e-text, interactive lessons and virtual learning? (Open Ended)

Thank you for sharing your time and opinions.

Faculty:
In an ongoing effort to improve our service, support and commitment to education, we would appreciate your participation in the following survey. This survey is designed to summarize our current technology program and provide information we can use to shape the future direction of technology on our campus. The survey should take approximately 10 minutes to complete and is for college professors only. Individual responses are confidential, and results will only be reported in aggregate. Thank you in advance for your time and honest feedback.

1. How do you feel about technology as a student learning tool?
   a) Technology is essential to success in my class
   b) Technology can be a useful tool, and I encourage students to use it
   c) Technology is optional in my class
   d) I have no use for technology in my class

2. A 21st-century classroom leverages technology to engage and empower professors and students. Which of the following technologies do you believe are essential to a 21st-century classroom? Please select all that apply.
   a) Internet connection
   b) Wireless Internet access
   c) LCD projector
   d) High-definition (HD) video conferencing
   e) iPad
   f) Interactive whiteboard
   g) Student computing device (e.g., laptops, netbooks, smartphones)
   h) Teacher computing device (e.g., laptops, netbooks, smartphones)
   i) E-reader device (e.g., Kindle, Sony Reader)
   j) “Smart” podium/lectern (one-touch control of the teaching environment, including the projection screen, lights, audio volume, DVD/VCR player, PC/laptop connection and microphone system)
   k) Digital content (e.g., online textbooks and material available online for download, including PDF documents, notes and other curricular materials in electronic form)
   l) Recorded class lectures for students to watch on their own free time
   m) Virtual learning, which delivers education to students who are not physically in the same location as the teacher and/or other students
   n) Online collaboration software (e.g., Google Apps, Open Office)
   o) Other, please specify: _____________________________

3. What percentage of your classes are held in a 21st-century classroom? (Please indicate 0-100% by fives or Don’t know)

4. Please indicate how strongly you agree or disagree with the following statement: It is important that I teach in a 21st-century classroom.
5. How would/does having a technology-rich classroom/learning environment change the way you teach? (Open Ended)

6. Please indicate how strongly you agree or disagree with the following statement: My college/university understands how I use or want to use technology as a teaching tool.
   a) Strongly agree
   b) Agree
   c) Neutral
   d) Disagree
   e) Strongly disagree

7. Please indicate how strongly you agree or disagree with the following statement: My college/university prepares students to use technology as a business/professional tool in the workforce.
   a) Strongly agree
   b) Agree
   c) Neutral
   d) Disagree
   e) Strongly disagree

8. Virtual learning delivers education to students regardless of where the professor and/or other students are located. Examples of virtual learning include, but are not limited to, online classes, distance learning, professors bringing in guest speakers through video conferencing and collaboration with professors and students in other locations. Do you offer virtual learning in the classes that you teach?
   a) Yes
   b) No, but I am considering it
   c) No
   d) Don’t know

9. What are the benefits of virtual/distance learning for your students? Please select all that apply.
   a) I do not see benefits of virtual learning
   b) Virtual learning gives students the opportunity to study with a broader variety of faculty members
   c) Virtual learning enables students to interact with a greater number of fellow students
   d) Virtual learning increases the variety of classes students can take
   e) Virtual learning provides the opportunity for professional adults to take classes while working full time

10. Outside of class, how do you prefer to communicate with your students? Please select your top three methods of communication.
    a) In-person
    b) Phone
    c) E-mail
    d) Instant message
    e) Facebook
    f) Twitter
    g) Course management tools (e.g., Blackboard, Jenzabar, Moodle, Web CT)
    h) Web-based video chat (e.g., Skype, Microsoft OCS)
    i) I prefer not to communicate with students outside of class
    j) Other, please specify: _____________________________

11. Does your campus provide faculty professional development specific to technology and classroom technology integration?
    a) Yes
    b) No (SKIP TO QUESTION 14)
    c) Don’t know (SKIP TO QUESTION 14)

12. Are you satisfied with the technology professional development to which you have access?
    a) Yes
b) No

c) Don’t know

13. How could your campus improve the technology professional development you receive? (Open Ended)

14. How do you integrate technology in your classes? (Open Ended)

15. Which of the following technologies/Internet tools do you use in conjunction with teaching (e.g., to prepare for lectures, while teaching a class, to work on projects, to work with colleagues and/or students)? Please select all that apply.
   a) Laptop computer
   b) Tablet computer
   c) Netbook computer
   d) Desktop computer
   e) iPad
   f) iPod/MP3 player
   g) E-reader device (e.g., Kindle, Sony Reader)
   h) Digital video recorder (e.g., Flip)
   i) Smartphone (e.g., BlackBerry, Droid, iPhone)
   j) High-definition video conferencing
   k) Video conferencing
   l) Web conferencing
   m) Online text or video chat
   n) Course management system (e.g., Blackboard, Jenzabar, Moodle, Web CT)
   o) Digital content (e.g., online textbooks and material available online for download, including PDF documents, notes and other curricular materials in electronic form)
   p) Interactive whiteboards
   q) Student response systems (a.k.a. “clickers” or learning response systems)
   r) Open source applications (e.g., Google Apps, OpenOffice)
   s) Social networking sites (e.g., Facebook, Twitter, Google Buzz, LinkedIn, MySpace)
   t) Blogs
   u) Wikis
   v) Podcasts/vodcasts
   w) Other, please specify: _____________________________

16. In your personal life, outside of the classroom teaching experience, what technologies do you regularly use? Please select all that apply.
   a) Laptop computer
   b) Tablet computer
   c) Desktop computer
   d) Netbook computer
   e) iPad
   f) iPod/MP3 player
   g) E-reader device (e.g., Kindle, Sony Reader)
   h) Digital video recorder (e.g., Flip)
   i) Smartphone (e.g., BlackBerry, Droid, iPhone)
   j) Videoconferencing
   k) Web conferencing
   l) Online text or video chat
   m) Digital content (e.g., online books and material available online for download, including PDF documents, notes and other materials in electronic form)
   n) Open source applications (e.g., Google Apps, OpenOffice)
   o) Social networking sites (e.g., Facebook, Twitter, Google Buzz, LinkedIn, MySpace)
   p) Blogs
   q) Wikis
   r) Podcasts/vodcasts
   s) Other, please specify: _____________________________
17. What is the biggest challenge to classroom technology at your institution? Please select one.
   a) Professors don’t know how to use it
   b) Professors won’t use it
   c) My campus does not have enough technology to adequately serve students
   d) Our classrooms are not outfitted with technology
   e) Lack of technical support, which means that technology does not always work
   f) Technology isn’t useful to the courses of study at my institution
   g) Technology is outdated
   h) Lack of budget
   i) Technology is fully integrated into the classroom – there are no obstacles
   j) Other, please specify: _____________________________

18. What would you like to be able to do with technology in the classroom that you currently cannot? (Open Ended)

19. Thinking about how your use of technology as a teaching tool has evolved in the last five years, what “lessons learned” can you share with your peers? (Open Ended)

20. Some institutions are considering digital/online textbooks/e-text as an alternative to traditional print textbooks. Textbooks are delivered via a laptop, netbook, or e-reader device. What benefits, if any, do you see for your campus and students from such a move? Please select all that apply.
   a) Instant access to content
   b) Access to most current content
   c) Increased student engagement
   d) Cost savings for students
   e) Do not see any benefits
   f) Other, please specify: _____________________________

21. What challenges do you see for your campus and students by moving to digital/online textbooks/e-text? Please select all that apply.
   a) Availability of or access to digital/online textbooks/e-text
   b) Availability of or access to a digital content reader or computing device
   c) Lack of funding
   d) Faculty reluctance to move to digital/online textbooks/e-text
   e) Departmental reluctance to move to digital/online textbooks/e-text
   f) Lack of IT infrastructure to support a move
   g) Lack of understanding of the benefits of digital or online textbooks
   h) There are no challenges to moving to digital or online textbooks
   i) Other, please specify: _____________________________

22. What subject areas do you currently teach? Please select all that apply.
   a) Agriculture
   b) Business
   c) Communications
   d) Education
   e) Engineering
   f) Fine and Applied Arts
   g) Health
   h) Law and Legal Studies
   i) Liberal Arts
   j) Medicine
   k) Science
   l) Vocational & Technical
   m) Other, please specify: _____________________________

Thank you for sharing your time and opinions.
APPENDIX C: HOLLAND COLLEGE SURVEYS

Technology Survey - Students

1. Age
   - 20 and under
   - 21-24
   - 25-34
   - 35-49
   - 50 and over

2. Gender
   - Female
   - Male

3. Program of study
   - Applied Sciences and Engineering Technology
   - Bachelor of Education Degree/Certificate in Education
   - Business Studies
   - College Foundation
   - Computer Studies
   - The Culinary Institute of Canada
   - Health & Community Studies
   - Marine Training
   - Media & Communications
   - Atlantic Police Academy
   - Tourism & Travel Program
   - Sport & Leisure Program
   - Trades & Industrial Technology
   - Adult Education & GED
   - Language Training
   - Other
Year of Study

4.
- First
- Second
- Third or more

When you decided to attend Holland College, how important was the technology being offered to students including the computer equipment and access to that equipment, in your decision?

5.
- Extremely important
- Somewhat important
- Not very important
- Not at all important

How important is it that Holland College offers the following to students? Please answer extremely, somewhat, not very, or not at all under each of the following.

6.
- Wireless Network access
- Extremely
- Somewhat
- Not Very
- Not at all

7.
- Course Management System (e.g. SAM)
- Extremely
- Somewhat
- Not very
- Not at all

8.
- Digital Content (e.g. online textbooks and material available online for download, including PDF documents, notes and other curricular materials in electronic form)
- Extremely
- Somewhat
- Not very
- Not at all

9.
- Interactive whiteboards (e.g. Smartboards)
- Extremely
- Somewhat
- Not very
- Not at all

10.
- Ability to access course management system (e.g. SAM) from off-campus locations
- Extremely
- Somewhat
- Not very
- Not at all

11.
- Distance education, where students don’t meet face to face with instructors and other students
- Extremely
- Somewhat
- Not very
- Not at all

12.
- Recorded class lectures to watch on your own time
- Extremely
- Somewhat
- Not very
- Not at all

13.
- Campus computer labs
- Extremely
- Somewhat
- Not very
- Not at all
Multimedia content streaming (e.g. short video clips that are content related)

14. 
- Extremely
- Somewhat
- Not very
- Not at all

Holland College website

15. 
- Extremely
- Somewhat
- Not very
- Not at all

Social networking (e.g. facebook, twitter)

16. 
- Extremely
- Somewhat
- Not very
- Not at all

Taking into consideration the list above and from your own experience, what computer technologies would you like to have access to that would support and enhance your learning? (Optional)

Which of the following technologies do you use most often for education (e.g., to study, while in class, to work on projects)? Please select the top 5 responses.

- Home desktop computer
- On-campus desktop computers
- Portable computer with wireless access (e.g., laptop, tablet, netbook, iPad)
- Smartphone with ability to browse the web (e.g., Blackberry, iPhone, cellphone)
- E-reader device (e.g., Kindle, Sony Reader)
- Web-conferencing
- Online text or video chat
- Course management system (e.g. SAM)
- Social networking sites (e.g., Facebook, Twitter, Google Buzz, LinkedIn, MySpace)
- Blogs
- Wikis
- Podcasts

Which of the following technologies do you use most often for personal use (e.g., to connect with friends/family or for hobbies, extracurricular activities and relaxation)? Please select the top 5.

- Home desktop computer
- On-campus desktop computer
- Portable computer with wireless access (laptop, tablet, netbook, iPad)
- Smartphone with ability to browse the web (e.g. Blackberry, iPhone, cellphone)
- E-reader device (e.g., Kindle, Sony Reader)
- Online text or video chat
- Course management system (e.g., SAM)
Social networking sites (e.g., Facebook, Twitter, Google Buzz, LinkedIn, MySpace)
Blogs
Wikis
Podcasts

How often do you use technology for education (e.g. to study, while in class, to work on projects)?

☐ Every day
☐ At least once a week
☐ Several times throughout the semester
☐ Rarely
☐ Never

How important is technology to your education (e.g., to study, while in class, to work on projects)?

☐ Very important
☐ Important
☐ Somewhat important
☐ Not important

How important is technology in preparing you for your chosen profession?

☐ Very important
☐ Important
☐ Somewhat important
☐ Not important

Outside of class, how do you prefer to communicate with your Learning Managers/Instructors?

☐ In person
☐ Phone
☐ E-mail
☐ Instant message
☐ Social networking (e.g., Facebook, Twitter, LinkedIn)
☐ Course management system (e.g., SAM)
☐ Web-based video chat (e.g., Skype, Microsoft OCS)
☐ I do not communicate with teachers outside of classes
Which of the following do you own? Please select all that apply.

24.  
☐ Desktop computer  
☐ Portable computer or device (e.g., laptop, iPad, tablet, netbook)  
☐ eBook reader (e.g., Kindle, Sony reader)  
☐ Smartphone (e.g., iPhone, Blackberry, cellphone with ability to browse the web)  
☐ iPod/MP3 player  

Which of the following do you plan to own in the next 6 months?

25.  
☐ Desktop  
☐ Portable computer or device (e.g., laptop, iPad, tablet, netbook)  
☐ eBook reader (e.g., Kindle, Sony reader)  
☐ Smartphone (e.g., iPhone, Blackberry, cellphone with ability to browse the web)  
☐ iPod/MP3 player  

Do you prefer to use the Internet to access such things as course grades, assignments and tests?

26.  
☐ strongly agree  
☐ mildly agree  
☐ mildly disagree  
☐ strongly disagree  

What percentage of your course materials do you expect to access through the Internet?

27.  
☐ None  
☐ 10%  
☐ 20%  
☐ 30%  
☐ 40%  
☐ 50% or more  

Please select the one technology tool that you **DO NOT** currently use or have at your disposal that you believe, would be most useful in your studies.

28.  
☐ desktop computer  
☐ portable computer (e.g., laptop, netbook, Ipad, tablet)  
☐ Ipod/MP3 player  
☐ E-reader device (e.g., Kindle, Sony Reader)  
☐ Smartphone (e.g., Blackberry, Droid, i Phone)  
☐ Web conferencing  
☐ Online text or video chat
Interactive whiteboards
Social networking sites for courses (e.g., Facebook, Twitter, LinkedIn, MySpace)
Blogs for specific courses
Podcasts

Holland College instructors understand how I want to use technology for education. Please select the response that best describes how strongly you agree or disagree with the above statement.

- Strongly agree
- Mildly agree
- Mildly disagree
- Strongly disagree

What is the biggest challenge to classroom technology at Holland College? Please select the top 3.

- My Learning Managers/Instructioners don’t know how to use it
- My Learning Managers/Instructioners won’t use it
- Holland College does not have enough technology to adequately serve students
- Our classrooms are not outfitted with technology
- Lack of technical support, which means that technology does not always work
- Technology isn’t useful to my course of study
- Technology is outdated

Please list any other barriers or challenges to technology use at Holland College (Optional).

Learning Managers/Instructioners understand technology and it is fully integrated into my classes.

Please select how strongly you agree or disagree with the above statement.

- strongly agree
- mildly agree
- mildly disagree
- strongly disagree

Learning Managers/Instructioners do not understand technology and do not use it. Please select how strongly you agree or disagree with the above statement.

- Strongly agree
- Mildly agree
- Mildly disagree
- Strongly disagree

How does having a technology-rich classroom/learning environment change the way you learn?

Looking ahead, which of the following technology skills do you think will be most important to your success in the workforce? Please select the top three responses.

- Email composition
- Social Networking (e.g., Facebook, Twitter)
- Smartphone use
- Wordprocessing (e.g. using Microsoft word or WordPerfect)
- Scanning documents, faxing, photocopying
- Presentation development
- Spreadsheet development
Virtual learning delivers education to students regardless of where the instructor and/or other students are located. Examples of virtual learning include, but are not limited to, online classes, distance learning, instructors bringing in guest speakers through video conferencing and collaboration with instructors and students in other locations. Have you ever taken a class that used virtual learning?

☐ Yes
☐ No

Please select the response that best describes how you feel about virtual learning.

☐ I do not see benefits of virtual learning/I do not want to take a virtual learning class
☐ Virtual learning gives me the opportunity to study with a broader variety of faculty members
☐ Virtual learning enables me to interact with a greater number of fellow students
☐ Virtual learning increases the variety of classes I can take
☐ Virtual learning provides the opportunity for professional adults to take classes while working full time

Social media uses mobile and Web-based communications platforms to enable real-time dialogue and content sharing. Examples of social media tools include the following: Facebook, Twitter, blogs and wikis. How often do you use social media to study or work on class assignments?

☐ Every day
☐ Several times a week
☐ Several times a month
☐ Rarely
☐ Never

Would you like to use social media to study or work on class assignments more than you currently do?

☐ Yes  ☐ No

Some colleges are considering digital/online textbooks/e-text as an alternative to traditional print textbooks. Textbooks are delivered via a computer and no hard copy of the book is required. Do you currently use ebook/digital textbooks?

☐ Yes  ☐ No

Which would you prefer to use if they were the same price?
42. What benefits, if any, do you see in using digital/online textbooks/e-texts? Please select all that apply.

- Instant access to content
- Increased student engagement
- Cost savings for students
- Ease of note taking
- Do not see any benefits

43. What challenges, if any, do you see in using digital/online textbooks/e-text? Please select all that apply.

- Availability of, or access to, digital or online textbooks
- Availability of, or access to, a digital content reader or computing device
- Affordability of digital textbook device
- Instructor reluctance to move to digital or online textbooks
- Some students prefer print material
- Lack of understanding of the benefits of digital or online textbooks
- I do not want to use digital/online textbooks/e-text
- There are no challenges to moving to digital or online textbooks

44. Do you have anything else to add concerning the technology at Holland College and the use of technology to support and enhance learning?

Thank you for sharing your time and opinions. If you would like to be entered in a draw to win one of 4 iPod Touches, please include your email below. Please note, your email will not be used for any other purpose and will not be retained as part of the survey.

Technology Survey - Learning Managers

1. Age

- 20 - 34
- 35 - 44
- 45 - 54
- 55 and over

2. Gender
3. Program of Instruction

☐ Applied Sciences and Engineering technology
☐ Business Studies
☐ College Foundation
☐ The Culinary Institute of Canada
☐ Health & Community Studies
☐ Marine Training
☐ Media & Communications
☐ Atlantic Police Academy
☐ Tourism Program
☐ Sport & Leisure
☐ Trades & Industrial Technology
☐ Adult Education & GED
☐ Language Training

Please select the response that best describes how you feel about technology as a student learning tool.

4. 

☐ Technology is essential to success in my class
☐ Technology can be a useful tool, and I encourage students to use it
☐ Technology is optional in my class
☐ I have no use for technology in my class

A 21st-century classroom leverages technology to engage and empower instructors and students.

5. Which of the following technologies do you believe are essential for a 21st-century classroom? Please select all that apply.

☐ Internet connection
☐ Wireless Internet access
☐ LCD projector
☐ High-definition (HD) video conferencing
☐ Interactive whiteboards (e.g., Smartboards)
☐ Student computer access
☐ Instructor computer access
6. How does having a technology-rich classroom/learning environment change the way students learn?

7. The management of Holland College understands how I use technology as a teaching tool. Please indicate how strongly you agree or disagree.

   - Strongly agree
   - Slightly agree
   - Slightly disagree
   - Strongly disagree

Holland College courses and programs prepare students to use technology as a business/professional tool in the workforce. Please indicate how strongly you agree or disagree.

8. Which of the following technologies do you use most often for teaching? Please select the top five.

   - desktop computer
   - portable computer
   - Smartphone (e.g., Blackberry, iPhone, cellphone)
   - E-reader (e.g., Kindle, Sony Reader)
   - Web conferencing
   - Online text or video chat
   - Course management system (e.g., SAM)
   - Digital content (e.g., online textbooks and material available online for download, including PDF documents, notes and other curricular material in electronic form)
   - Interactive whiteboards
   - Student response systems (a.k.a., "clickers" or learning response systems)
   - Social networking sites (e.g., Facebook, Twitter)
Outside of class, how do you prefer to communicate with your students? Please select the top three methods of communication:

- In-person
- Phone
- Email
- Instant message
- Facebook
- Twitter
- Course management system (e.g., SAM)
- Web-based video chat (e.g., Skype)
- I prefer not to communicate with students outside of class

How often do you use technology as a teaching tool?

- Every day
- At least once a week
- Several times a month
- Rarely
- Never

How important is it that Holland College offers the following to students? Please answer extremely, somewhat, not very, or not at all for each of the following.

12. Wireless network access
   - Extremely
   - Somewhat
   - Not very
   - Not at all

13. Course management system (e.g., SAM)
   - Extremely
   - Somewhat
   - Not very
   - Not at all

14. Interactive whiteboards (e.g., Smartboards)
   - Extremely
   - Somewhat
   - Not very
   - Not at all

15. Digital content (e.g., online textbooks and material available online for download, including PDF documents, notes and other curricular materials in electronic form)
   - Extremely
   - Somewhat
   - Not very
   - Not at all
Ability to access SAM from off campus locations

16.
- Extremely
- Somewhat
- Not very
- Not at all

Distance learning, where students don’t meet face to face with instructors and other students

17.
- Extremely
- Somewhat
- Not very
- Not at all

Campus computer labs

18.
- Extremely
- Somewhat
- Not very
- Not at all

Multimedia content streaming (e.g., short video clips that are content related)

19.
- Extremely
- Somewhat
- Not very
- Not at all

Holland College website

20.
- Extremely
- Somewhat
- Not very
- Not at all

Social networking sites (e.g., facebook, twitter)

21.
- Extremely
- Somewhat
- Not very
- Not at all

Taking into consideration the list above and from your own experience, please list any computer technologies that you would like to have access to that would support and enhance your student’s learning?

22. How do you integrate technology into your classes?

23.

Which of the following technologies/Internet tools do you use in conjunction with teaching (e.g., to prepare for lectures, while teaching a class, to work on projects, to work with colleagues and/or students)? Please select all that apply.

- Desktop computer
- Portable computer (e.g., laptop, tablet, netbook, iPad)
- iPod/MP3 Player
- E-reader (e.g., Kindle, Sony Reader)
- Smartphone (e.g., Blackberry, iPhone)
- High definition video conferencing
- Video/Web conferencing
- Online text or video chat
Digital content (e.g., online textbooks and material available online for download, including PDF documents, notes and other curricular materials in electronic form)
Interactive whiteboards (e.g., Smartboards)
Social networking (e.g., Twitter, Facebook)
Blogs
Wikis
Podcasts

Please select the one technology tool that you DO NOT currently use or have at your disposal that you believe, would be most useful to support and enhance your program.
Desktop computer
Portable computer
Ipod/MP3 player
E-reader (e.g., Kindle, Sony Reader)
Smartphone (e.g., Blackberry, Droid, iPhone)
Web conferencing
Online text or video chat
Digital content (e.g., online textbooks and material available online for download, including PDF documents, notes and other curricular materials in electronic form)
Social networking sites
Blogs
Podcasts
I have all the technology I need at my disposal

Do you prefer to use the Internet to provide such things as course grades, assignments and tests to students? Please indicate how strong you agree or disagree.

- Strongly agree
- Mildly agree
- Mildly disagree
- Strongly disagree

What percentage of your course materials do you allow students to access through the Internet?

- None
- 10%
Does Holland College provide professional development specific to technology and classroom technology integration?

☐ Yes  ☐ No  ☐ Don't know

Thinking about the software (programs used to direct operation of computers, including but not limited to SAM, word-processing, spreadsheets, and databases) available to you, how would you rate your ability to maximize its benefits to learners in a classroom?

☐ Low  ☐ Medium  ☐ High

Would professional development specific to the classroom application of this software’s increase the usefulness to you?

☐ Yes  ☐ No

Thinking about the hardware (components that make up a computer system including but not limited to keyboard, disk drives, monitor) available to you, how would you rate your ability to maximize its benefit to learners in the classroom?

☐ Low  ☐ Medium  ☐ High

Would professional development specific to the classroom application of these hardware increase the usefulness to you?

☐ Yes  ☐ No

Are you satisfied with the technology professional development that is offered at Holland College?

☐ Yes  ☐ No  ☐ Don't know

Do you need more professional development in technology and/or technology enhanced learning?

☐ Yes  ☐ No  ☐ Don't know

How could Holland College improve the technology professional development you receive?

In your opinion, how should the professional development technology training be administered? Please select the top 3 responses.

☐ Hands on training on how to use technology
☐ Self directed experiential learning
☐ Instructor led classroom training
☐ Online learning courseware or tutorials
37. What is the biggest challenge to classroom technology at Holland College? Please select the top 3.
☐ Learning Managers/Instructors don’t know how to use it
☐ Learning Managers/Instructors won’t use it
☐ Holland College does not have enough technology to adequately serve students and instructors
☐ Our classrooms are not outfitted with technology
☐ Lack of technical support, which means that technology does not always work
☐ Technology isn’t useful to the courses at Holland College
☐ Technology is outdated
☐ Lack of budget
☐ Technology is fully integrated into classrooms, there are no obstacles

38. Please list any other barriers or challenges to technology use at Holland College.

39. thinking about how your use of technology as a teaching tool has evolved over the last 5-10 years,
40. please list any lessons learned.

Virtual learning delivers education to students regardless of where the instructor and/or other students are located. Examples of virtual learning include, but are not limited to, online classes, distance learning, instructors bringing in guest speakers through video conferencing and collaboration with instructors and students in other locations.

Do you offer virtual learning in the classes that you teach?
☐ Yes ☐ No ☐ No, but I am considering it

41. What are the benefits of virtual/distance learning for your students? Please select all that apply.
☐ I do not see benefits of virtual learning
☐ Virtual learning gives students the opportunity to study with a broader variety of faculty members
☐ Virtual learning enables students to interact with a greater number of fellow students
☐ Virtual learning increases the variety of classes students can take
☐ Virtual learning provides the opportunity for professional adults to take classes while working full time

42. Please list any challenges you see to virtual/distance learning.

43. Some colleges are considering digital/online textbooks/e-text as an alternative to traditional print textbooks. Textbooks are delivered via a computer and no hard copy of the book is required. Do you currently use eBook/digital textbooks for teaching or for your personal life?
Which would you prefer to use if they were the same price?

44. ☐ E-books/digital online textbooks      ☐ Books or instruction manuals (hard/soft covered) ☐ I don't care

What benefits, if any, do you see in using digital/online textbooks/e-texts? Please select all that apply.

45. ☐ Instant access to content
☐ Increased student engagement
☐ Cost savings for students
☐ Ease of note taking
☐ Do not see any benefits

What challenges, if any, do you see in using digital/online textbooks/e-text? Please select all that apply.

46. ☐ Availability of, or access to, digital or online textbooks
☐ Availability of, or access to, a digital content reader or computing device
☐ Affordability of digital textbook device
☐ Instructor reluctance to move to digital or online textbooks
☐ Department reluctance to move to digital/online textbooks/e-texts
☐ Lack of IT infrastructure to support a move
☐ Lack of understanding of the benefits of digital or online textbooks
☐ There are no challenges to moving to digital or online textbooks

Do you have anything else to add concerning the technology at Holland College and the use of technology to support and enhance learning?

Thank you for sharing your time and opinions. If you would like to be entered in a draw to win an iPad, please include your email below. Please note, your email will not be used for any other purpose and will not be retained as part of the survey.
# APPENDIX D: POPULATIONS BY PROGRAM

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<thead>
<tr>
<th>Applied Sciences &amp; Eng Tech</th>
<th># of Students</th>
<th># of Faculty</th>
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<tbody>
<tr>
<td>Architectural Technology YR1</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Architectural Technology YR 2</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Bioscience Technology</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Construction Technology YR1</td>
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</tr>
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## Media & Computer Studies

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## Bachelor of Education/Certificate in Education

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## Business Studies

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