How Does a Virtual Learning Environment Support and Enhance Community Building in Initial Teacher Education Cohorts?

by

Marla Anne Zupan

A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy
Department of Curriculum, Teaching & Learning
University of Toronto

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Abstract

In 2012-2013, a new virtual learning environment called Pepper was introduced to six face-to-face student cohort groups in an Initial Teacher Education (ITE) program at a large Ontario university. Cohort instructors reported a high level of student engagement and felt that Pepper was more successful at supporting community than the previous commercial course management system. These findings inspired the current case study. What specific features and functionality of Pepper seemed to promote a deeper sense of community within these cohort-based environments, and why?

The research questions were answered by collecting data from a variety of sources. First, in order to comprehend student/instructor online behaviours, automatically generated Pepper log files were examined. A survey was conducted to gather student opinions about different aspects of Pepper’s functionality. Finally, students, instructors and the developer were interviewed to gather in-depth perspectives and experiences.

Data analysis revealed that, contrary to expectations, Pepper was not used to conduct community-wide discussions, since most conversations took place daily during face-to-face classes. Instead, Pepper’s perceived value was associated with its ease of use and its ability to i)
share documents; ii) send and receive private messages; iii) make announcements; and iv) integrate calendars. Thus it complemented face-to-face community activities rather than replacing them. The research documented unconventional and innovative instructor uses of Pepper, including the hosting of multiple cohort groups in one shared environment and the use of a shared folder feature to foster overlapping cohort memberships. These behaviours mark a change from other course management systems where courses exist in separate online silos with no opportunity for interaction or collaboration.

Logfiles revealed that private messaging was used more often than public postings, despite the environment’s open format, raising questions about the possible importance of private discourse in communities. Finally, there was a perceived need for Pepper to be more accessible through smartphones to better support students’ moment-by-moment need for information between and during classes.

Recommendations are made relating to instructor and student training, full open access courses, additional tools and graphic representations. The concept of participatory presence is introduced as a new online cohort community framework.
Dedication

To my grandmother, Rose, who faced numerous challenges throughout her life but always persevered with a smile and an indomitable spirit. Thank you for always being a model of patience, dignity and quiet strength. Your courageousness knew no bounds and your generosity had no limits. Thank you with all my heart for supporting my undergraduate educational endeavours. Without you, this study would not have been realized.

To my late father, Stan, who valued education and found fulfillment in reading voraciously. Recalling your inventive, artful phrases that always encapsulated things perfectly got me through many difficult moments: “I may be wrong, but…” I miss you all the time and wish that you could have been here to keep things “real”.

To my sister, Krista, a doctor herself (Ed.D) and a highly principled and respected educator. Your fierce loyalty, dedication, empathy and amusing text messages always made me feel better! ☺️ Thanks for empathizing, understanding and commiserating as only someone who has already walked the path can do.

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To Roman, who as of today’s date is still relatively new on the scene but is already a pro at smiling and learning new things at 5 months old. A future OISE student, perhaps?

And last, but certainly not least, to my beautiful, dynamic, talented and brave mother, Rose Marie: your spirit, style, strength and wit are second to none. Thanks for believing, reassuring, listening, laughing, critiquing, questioning, suggesting and inspiring me….every single day. Your counsel and guidance are always appreciated and if I am fortunate enough to become half the educator that you are, I will consider myself truly blessed!

I am who I am because of ALL of you. God bless you all! xo
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However, as interests and ideas changed, so too, did my research process. Studying online social presence soon became an examination of online learning, which finally evolved into an exploration of community building.
Thank you for your belief in this research and in my ability to conduct a mixed methods case study. You challenged me to critically examine my work through a researcher’s lens, which forced me out of my familiar “teacher zone”! This entire process has been an invaluable experience and I am most grateful to see it come to a fruitful conclusion.

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Glossary of terms

Below is a list of acronyms and terms that will be used throughout this dissertation:

24/7 – 24 hours, 7 days a week

Announcements – messages that are posted by instructors to a special read-only folder on Pepper. Messages are typically time sensitive and contain important information and/or due dates.

AQ – Additional Qualification certification courses for teachers

CK – An acronym for Content Knowledge.

CMC – computer-mediated communication

GIF – graphic interchange format (picture format)

ICQ – an instant messaging program meaning “I Seek You”

ICT – an acronym for Information and Communication Technology.

ITE – Initial Teacher Education program. This is a generic name given to all teacher education programs in the province of Ontario.

Instructors – This term refers to both Option Coordinators and instructors of individual teacher-education courses.

JPEG – Joint Photographic Experts Group – a format for compressing images

KeC – Knowledge eCommons, a learning management system developed at the university

MAPs – mini audio presentations, used to support online engagement

M.Ed. – An acronym for the Master of Education degree.

Message – In the context of Pepper, this refers to a private text message. Text messages can be sent to one person or more, depending on the writer.

MOOC – an acronym for Massive Open Online Course.

MOODLE – an acronym for Modular Object-Oriented Dynamic Learning Environment. This refers to a specific learning management system.
MUELE – acronym for Makerere University Electronic Learning Environment

Notes - In terms of Pepper, notes are public messages that are published to conferences. They can be made public or private. Public notes can be co-authored, meaning that more than one person can contribute to it. Similar to a wiki, private notes are also called drafts and are only visible to the writer.

Notifications – On Pepper, this refers to messages that are sent to one’s personal address.

PCK – An acronym for Pedagogical Content Knowledge.

PK – An acronym for Pedagogical Knowledge.

SAMR – An acronym for the Substitution, Augmentation, Modification and Redefinition model as articulated by Puentedura (2010).

TCK – An acronym for Technological Content Knowledge.

TK – An acronym for Technological Knowledge.

TPACK – An acronym for Technological, Pedagogical and Content Knowledge.

TLP – The Learning Partnership, a not-for-profit organization

UWO – University of Western Ontario

Wall – On Pepper, the Wall is a static scrolling text window where students and instructors can post messages to one another. Usually social in nature, some messages do contain important information related to class or room changes.

Web 2.0 – refers to websites that use technology such as blogs, wikis and videos

Web CT – Web Course Tools, a learning management system

WYSIWYG – What you see if what you get: describes a toolbar with multiple features and formatting functions.
1 Chapter 1

1.1 Preparing today’s graduates for tomorrow’s realities

For the past thirty-five years, Canadian universities have worked to redefine teaching and learning as an ongoing process and lifelong journey (Fenning, 2004). This is especially true for today’s students, whose pursuit of a higher education is constantly challenged by the ongoing evolution of technology and its subsequent impact on the workforce. Given the diversity of media and variety of web 2.0 tools, job seekers are now expected to possess a greater degree and range of skills than ever before (McPhail, Robinson & Scott, 2008). Employers from all fields have expressed their concern over the inability of new graduates to solve problems independently, write effectively and work collaboratively in teams (Beachboard, Beachboard, Li & Adkison, 2011).

Faced with this new reality, it is imperative that institutions of higher education take time to examine their current practices. This is a necessary step if they want to continue to deliver the requisite knowledge and skills that students need in order to thrive in society (Beachboard, et al, 2011). One suggestion involves taking students with similar educational goals and placing them in groups based on a cohort educational model (Lei & Gorelick, 2011). Cohort groups are not a new innovation, having first been introduced in the 1950s (Greenlee & Karanxha, 2010). In fact, one of the first applications of cohort-based learning was for the training of doctors and lawyers. It has been introduced only recently into other areas of post-graduate education including Initial Teacher Education (ITE) programs (Barnett & Basom, Yerkes & Norris, 2000; Maher, 2005). Cohort groups are dynamic entities that encourage both engagement and interaction through collaborative problem solving (Greenlee & Karanxha, 2010). This in turn can promote the
development of the skills that are expected of today’s graduates if they are to succeed and ultimately survive in the workplace.

In ITE programs, cohort-based learning offers students many advantages. A few examples include a clear course structure, mutual support through increased instructor-student and student-student interactions, higher degree completion rates as well as the development of academic and professional skills (Greenlee & Karanxha, 2010). One other advantage that will be explored in greater detail over the course of this investigation is how cohort-based learning encourages the formation of community. Students who are grouped together are afforded different opportunities and methods whereby they can communicate and exchange ideas with one another. This sharing of information supports a back-and-forth or horizontal flow of information, which Lawrence (2002) feels is key to positive learning experiences.

In recent years, with the introduction of social media and other online supports, the notion of “cohort” has broadened. A cohort is no longer simply viewed as a group of students that take classes together over a set period of time. Now, through the introduction of virtual environments, students can meet other members of their larger ITE family in online spaces after class. Unlike traditional cohort-based learning models of the past, students are now able to access and interact with a diverse audience of fellow learners. It is this phenomenon, which is the focus of the current study. How might cohort communities be strengthened through the design of online spaces? What types of online supports add value and enrich the cohort experience for instructors and students?

This study was inspired by an unexpected development that took place in an Ontario teacher education program during the 2012 – 2013 academic year. At that time, a new virtual learning environment called Pepper was introduced into six ITE student cohorts at a large urban
university. Its integration was not a surprise as it followed two previous learning management systems. Students and instructors alike were already familiar with the presence of a virtual environment to enhance their existing cohort-learning model. However, instructors who oversaw individual cohort groups began to report a high level of student engagement over time. They felt that Pepper was more successful at supporting community than the course management systems preceding it had been. Through the development of three research questions and the collection of qualitative and quantitative data, the goal of this investigation is to discover reasons for this phenomenon while offering recommendations to strengthen other cohort communities through the inclusion of online environments.

The Ontario university where this investigation unfolded has hosted numerous online courses, using Blackboard as its primary learning management system. However, a new database named Pepper was first introduced to university instructors and students as an alternative online environment in 2009. Formerly known as Knowledge eCommons (KeC), it was developed by an associate professor employed by the university. Over the years, KeC had been used to successfully deliver numerous undergraduate and post-graduate online courses. As its successor, Pepper has been used in several flex-mode courses, featuring a variety of technological tools that students can use to communicate with one another.

In 2012, Pepper was introduced into the ITE program as a means to complement several preservice teacher cohort groups that met on campus throughout the week. While a substantial body of research exists on post-secondary classroom cohorts as well as those that are formed exclusively online, there is still a significant gap in terms of how virtual learning environments can complement undergraduate cohort groups. To date, no study has been conducted to examine
how cohort-based learning can be supported by new technology that is made available to students after class hours.

1.2 Problem statement

This dissertation will examine how a virtual learning environment can be used to complement cohort-based learning at a large urban university in Ontario. It will explore the emergence and development of student-student and student-instructor relationships in a cohort of nearly 420 ITE students. This investigation may also provide insight in terms of how workplace skills such as collaboration, critical thinking and problem solving develop among a group of professionals-in-training. For the purposes of this investigation, three sub questions were developed:

1) How do the different ITE cohort groups use Pepper in terms of its functions and features?

2) According to instructors, what factors contribute to the development of community online?

3) How do students perceive and use a virtual learning environment as an extension of their classes?

The ITE program uses a cohort-based model to train approximately 420 teacher-candidates in the academic divisions of primary/junior, junior/intermediate and intermediate/senior. At the beginning of each school year, participants are divided into six cohort groups made up of approximately seventy students each. Two instructors known as Option Coordinators are assigned to cooperatively oversee one cohort while facilitating a virtual learning environment on Pepper. This investigation seeks to examine how the inclusion of this
online component influences the delivery of course programming, communication and social engagement between students and instructors.

Cohort-based learning models in face-to-face classrooms have been used regularly for the past thirty years as they have been shown to support student learning and progress. This in turn can lead to deeper educational experiences, as members are able to develop an affiliation for their colleagues. What would happen, then, if a virtual learning environment was used to complement a cohort-based learning community? Would this additional opportunity for community building and social interaction enhance the learning experience for participants? Would instructors use it to enrich their face-to-face teaching in new and innovative ways? These certainly are questions that are worthy of closer investigation, given today’s ever-evolving educational climate.

1.3 Background of the researcher

My foray into the world of online education began back in the year 2004, thanks to a pilot project invitation from The Learning Partnership (TLP). This organization invited intermediate-level science teachers to join a hybrid learning community in order to share their experiences and best practices. My curiosity was piqued as this took place several years before virtual learning environments went mainstream. My growing fascination with computers, coupled with the sheer novelty of this proposition prompted me to sign up immediately.

The time commitment required for this e-learning initiative was quite reasonable, with three face-to-face, full day meetings scheduled over a three-month period. Participants were also asked to log onto a computer for up to one hour a week in order to post responses to curriculum-related questions. While several teachers were reluctant to spend time engaging online, I
thoroughly enjoyed this new way of sharing my teaching experiences. In reality, the virtual component only required a few brief reflections that could be easily completed.

Ultimately, my new routine of daily navigation to the TLP site only whetted my appetite for virtual learning. Positive feedback prompted TLP to run a second incarnation of this blended learning community the following year. This time, a cohort-learning model was used to group returning instructors together, thereby enabling my group to build upon the connections, friendships and trust that had been previously formed.

My new interest in virtual learning coincided perfectly with the official introduction of online continuing teacher education courses in mid 2004. Although many colleagues were initially skeptical about this alternative method of professional development, online learning did help to alleviate some of the financial and time commitments that are a reality when taking face-to-face classes.

When several universities released their fall online course offerings in the summer of 2004, I was initially conflicted. As a young elementary teacher, I was well aware of the importance of ongoing professional development through the completion of AQ courses. The wide selection of available subject areas was impressive, ranging from Mathematics to Guidance. However, my appreciation for and interest in one particular subject ultimately determined my first course choice. I registered for the first part of a three-part specialist qualification course in Visual Arts. Reaction to my decision was mixed, as colleagues and friends seriously questioned how a subject dependent on visual representations could be successfully addressed in a virtual learning space.
Over time, their uncertainty evolved into teasing comments that were often tinged with scorn. Several friends tried to dissuade my participation, dismissing my “bird course” as an easy credit. I was repeatedly told that an online course would be both boring and unchallenging since I would have no opportunity whatsoever to interact with others. In fact, I was about to learn firsthand that nothing could have been further from the truth!

The course itself was hosted on the Web CT learning management system and individual modules were set up to delineate five content areas. Each module featured four separate forums where participants were expected to post original messages in response to specific activities and assignments. This setup echoed the TLP virtual space and I immediately felt comfortable navigating the site. One new component that I did not anticipate, however, was the integration of media. Three projects required participants to create unique works of art in the form of paintings, sculptures and sketches. However, the virtual nature of the course did not lend itself easily to class presentations and group sharing. I learned quickly that I would not only be responsible for creating original artwork, I would also have to find a way of displaying it online.

My doubtful colleagues began to appreciate the extra work and time that were required in order to create an original piece before deciding how best to share it electronically. The amount of incidental learning that took place in this one course alone was truly an eye-opener for me as this took place well before smart phones and built-in cameras! Using the light and flash on my digital camera were key if my colleagues and instructor were to clearly view my work and offer descriptive feedback. I learned to distinguish between GIFs (Graphics Interchange Format) and JPEGs (Joint Photographic Experts Group) in order to create acceptable files for uploading. File size also became an issue if I wanted to zip and transmit my work electronically. At this time, youtube and other online sharing sites such as Flickr, Photobucket and Shutterfly were not yet a
reality. Throughout this arduous learning journey, I was able to consult my fellow participants to elicit their support and ideas. Although this process was extremely challenging, I really enjoyed the feeling of community that developed as the course progressed. When the class ended three months later, I experienced a feeling of sheer pride upon realizing how online learning supports both individual and collective growth. I was completely captivated and knew that this form of learning suited both my personality and educational needs.

Although I am a self-admitted digital immigrant, I have nonetheless immersed myself in numerous online learning environments following my first AQ experience. In fact, nine of my twelve AQs were completed online and two leadership courses taken in 2007 were offered in blended learning formats. All of these experiences exposed me to different learning management systems including Web CT, Blackboard, MOODLE and Desire2Learn. Each online course gave me membership in and access to a new learning community that was made up of approximately 20 fellow instructors. I was able to witness how a sense of community and student engagement was either encouraged or disregarded by my instructors and to some extent, the learning environment itself.

In 2004, my growing love for online learning propelled me to apply for a Master of Education program at the University of Western Ontario (UWO). This particular program introduced two features that truly set it apart from other institutions. First, UWO’s goal was to be the first Canadian institution to pilot a fully online post-secondary degree program. This exciting revelation meant that I could still teach full-time in Toronto without having to take an extended leave of absence. Secondly, only twelve candidates would be admitted into the program’s flexible online cohort. The idea was for members to remain together for most of their classes and graduate as a cohort two years later.
Upon my acceptance to the program, my feelings of elation quickly gave way to those of anxiety. Despite my love of online learning, I began to seriously question the feasibility of a fully online graduate program. I needn’t have worried, however, as careful instructions guided me to the appropriate website. Using Web CT, my cohort colleagues and I learned firsthand the value (and necessity!) of presenting oneself in a virtual context. Although we were a small group, I clearly remember creating a cheat sheet for the purposes of recording basic information and interests about each colleague. This sheet was a useful guide in the absence of introductory icebreaker activities. I consulted it often in order to form meaningful connections with each participant. Although I had no qualms projecting my virtual personality in my AQ courses, I felt more reserved during this particular learning experience. Perhaps it was because I perceived this environment to be more “official” in that everything I typed and wrote would be in the hopes of earning a degree!

The format for UWO’s online M.Ed. program offered some flexibility within the cohort structure. All participants were expected to complete six online courses, half of which were mandatory. The remaining options could be taken outside of the cohort program. While most candidates opted to complete six courses followed by a major research paper, I chose the path of ten courses and writing a final examination. As a result, only a small number of UWO’s pilot cohort actually graduated two years later.

Although this academic venture did not end in the way that it had been originally envisioned, I still appreciated working and learning with a group to which I felt a strong affiliation. I emerged from this experience feeling more confident, despite witnessing occasional personality clashes and misunderstandings that define online contexts. Thinking back, I am also struck by the fact that little visual media in the form of video or photos was used or encouraged
during this experience. To this day I am at a loss to provide physical descriptions of anyone from my cohort save for one colleague whom I met several times face-to-face. In fact, these real-life meetings set the foundation for a friendship that enhanced our virtual understanding and appreciation of each other. It also translated into a mutually supportive and collaborative online partnership once our courses started up again in the fall.

Although I had participated in a variety of online experiences, the reality was that to date, I had been exposed to just one side of virtual education. I had a strong comprehension of what it meant to be an online learner but I was unaware of the roles and responsibilities that are expected of course instructors. I often wondered how several of my previous instructors could provide timely feedback and respond to my email so quickly. What strategies did they use to encourage a thriving community of learners? How did they establish their own social presence?

These questions persisted until late 2006, when an opportunity to facilitate an online AQ course presented itself. This new role afforded me an entirely new perspective of online learning that has been simultaneously challenging and enlightening. Unfortunately, no training sessions were offered at the time and as a newly minted instructor, I had to seriously contemplate my role in the formation of a supportive online community. Through sheer trial-and-error, I acquired and developed a variety of strategies that have helped me to engage with different types of learners. First and foremost, I recognized that instructors must be keenly aware of the diverse personalities and varying technological abilities of their students. Unlike face-to-face classes where different approaches can be initiated fairly quickly, instructors must navigate carefully so as not to overwhelm students and appear overbearing.

Instructors must also be committed from the start if they want to set a friendly tone that encourages both cohesion and collaboration. They must observe how students engage and
interact through the selection of available design features and web 2.0 tools. As a student, I was able to directly observe how an instructor’s social presence (or lack thereof) influenced levels of collaboration, trust and sharing in a virtual community. I also noticed how the inclusion of specific activities and design features impacted upon the quality and quantity of communication and engagement. However, I recognize that these observations are strictly my own and cannot be generalized to all virtual learning environments.

1.4 Organization of the dissertation

This proposal has been prepared in seven chapters, the first of which will serve as the introduction. Chapter 2 presents the literature review, which will address technology integration models, internet-based distance education, social presence, cohort-based learning and community development.

Chapter 3 describes in detail the methodology that was selected for this investigation. In addition, the ITE program, Pepper as well as the number and types of participants will be described. Two sets of interviews were conducted involving people who were actively involved in the design, application and execution of a virtual learning environment. Quantitative data taken from the Pepper database and presented as tables and visual presentations will also be explained.

Chapter 4 addresses the first research question through an analysis of five variables to better understand Pepper’s impact on cohort-based learning. Anova tests were conducted on log-in frequency, time online, public notes, private messages and note replies using quantitative data that was generated from the Pepper database. The student-student and student-instructor interactions that occurred using private messages and replies to notes will also be discussed using two different visual representations.
Chapter 5 focuses on the second research question by presenting the qualitative data that were collected from the two sets of interviews. The first section focuses on the perceptions and insights of three administrators (Roger, Donna and Louise) while the second set details the findings from four Option Coordinators (Carla, Micki, Eleanor and Marissa).

Chapter 6 addresses the third research question by presenting the quantitative and qualitative data that were obtained from an online student exit survey. Chapter 7 reveals the findings and implications that were realized as a result of this investigation. Here, I will make a series of six recommendations for future improvements and changes. This final chapter also posits a new way for both students and instructors to interact in virtual environments through a concept that I will call participatory presence.
2 Chapter 2

2.1 A Review of the Literature

This chapter will serve to introduce five concepts that are necessary in order to better understand the impact of a virtual learning environment on a cohort group. The first section will focus on two technology integration models known as TPACK (Technological, Pedagogical and Content Knowledge) and SAMR (Substitution, Augmentation, Modification and Redefinition). The next section will discuss internet-based distance education and how computer-mediated communication (CMC) is being used for engagement and interaction. Two forms of CMC, known as threaded discussions and real-time chat will be explored as well as visual media. In the third section, the ways in which a sense of community develops within a virtual learning environment will be studied through a concept known as social presence. This will be followed by an examination of the current research on cohort-based learning as it relates to initial teacher education programs. The advantages and disadvantages of different learning models will be discussed along with the evolving role of the Option Coordinators. Finally the development of virtual communities within cohort groups will be discussed. In addition, each section will address findings from a recent research study, revealing recommendations for future research that are of interest to this investigation.

2.2 Technology integration models

The successful integration of technology in educational contexts involves more than just a casual awareness of computer software and hardware. It requires knowledge of how technology can be effectively incorporated in order to enhance and complement one’s pedagogy and subject content (Koehler & Mishra, 2009). It is a reality that many of today’s teachers earned their degrees at a time when educational technology was still in its infancy (Koehler & Mishra,
Despite training opportunities that were offered, teachers by and large felt both unsupported by their institutions and overwhelmed by a seemingly never-ending technological evolution. It would appear that these early attempts for teacher professional development failed to consider that teachers work in diverse teaching and learning contexts (Koehler & Mishra, 2009). Consequently, many educators are resentful and to this day remain unmotivated to use digital technologies in their classrooms.

Several studies suggest that, in order for effective technology integration to occur, a multi-step process is required that includes modeling and ongoing opportunities for exploration. Unless teachers are taught the necessary skills to incorporate new technology into their existing pedagogies, any newly acquired knowledge is unlikely to be put into practice. Educators need time to fine tune their knowledge in order to develop an approach that can then be applied meaningfully in their classrooms. Two theoretical models that can help instructors achieve this will be explained in these following sections. The first framework is known as TPACK while the second is called the SAMR model. Both take into consideration the fact that instructors today need a process by which technology can be used to meaningfully support higher levels of student learning.
2.2.1 The TPACK model

The TPACK model provides educators with a theoretical landscape for introducing technology into their teaching (Louiseuk, 2012). It is an integration model that views teacher knowledge as an elaborate combination of content knowledge (CK), pedagogical knowledge (PK) and technological knowledge (TK) (Koehler & Mishra, 2009; Foulger & Slykhuis, 2013). At its core, TPACK provides a foundation and structure for describing what effective teaching with technology might include when computers are integrated into teaching environments (Koehler & Mishra, 2009). This framework uses teachers’ technological knowledge to help increase their quality of instruction, which begins with planning and preparation and ends with evaluation and assessment (Koehler & Mishra, 2009).

![Figure 1. The TPACK model, adapted from Koheler & Mishra (2009)](image)

The TPACK model expands upon Shulman’s (1987) principles of pedagogical content knowledge (PCK), which integrates teachers’ content knowledge with their pedagogical skills
PK describes a teacher’s understanding of the process of teaching and learning, specifically, their individual practices and methods. CK addresses one’s specific knowledge of a particular subject. The integration of content and pedagogy allows teachers to represent to themselves how problems and issues can be organized, represented and adapted for learners’ diverse interests and abilities (Shulman, 1987). In fact, Shulman felt that the integration of these two types of knowledge distinguishes the content specialist from the pedagogue (Shulman, 1987). Twenty years later, Koehler & Mishra built upon his research with their inclusion of technology (Koehler & Mishra, 2009). Their TPACK framework shows how teacher knowledge needs to expand in order to incorporate technology within a meaningful teaching framework. TPACK describes how teachers’ understanding of educational technologies and PCK need to interact to produce effective teaching with technology (Koehler & Mishra, 2009). In order for this to happen, however, instructors must understand the relationship and balance that exists between all three elements in order to develop appropriate and context-specific strategies (Louiseuk, 2012; Koehler & Mishra, 2009).

From a research standpoint, a number of different studies have been conducted over the years relating to teacher technology use (Yurdakul & Coklart, 2014). While these studies initially focused on technology skills acquisition, they are now beginning to examine the combination of technology with pedagogical knowledge (Yurdakul & Coklart, 2014). TPACK literature reveals the need for more research and development in order to empower instructors and challenge their ways of thinking about 21st century learning. The future looks promising with a number of new studies focusing on different aspects of TPACK.
2.2.1.1 Validating the TPACK framework

ITE students are using Pepper in order to develop their collaboration skills with one another as well as with their instructors. The acquisition of these skills, however, should not be limited to social interactions or course-related discussions. The TPACK framework provides the next logical step in that it marries technological skills with one’s knowledge of both educational content and pedagogy. The following study examines TPACK as a way for preservice teachers to integrate technology into their teaching.

Foulger & Slykhuis (2013) asked 78 student teachers at a Turkish university to develop educational materials for a subject of their choice. Data was collected in the form of observations, questionnaires, reports, materials and interviews.

The researchers first examined teachers’ core knowledge of the three concepts of TPACK, namely, PK, CK and TK. While 90% of participants felt comfortable with their CK, 70% reported having limited knowledge or experience with PK and they found it difficult to incorporate into their teaching.

In terms of their PCK, 60% of participants agreed that they were not comfortable with the pedagogy of their chosen subject area. With respect to their technological pedagogical knowledge (TPK), 83% reported that their use of technology was limited, due to their lack of pedagogical experience. TCK involves transforming content into different presentation formats. While 92% of preservice teachers were in favour of using technology to visualize content, 73% admitted that they focused more on technological rather than educational ideas. They agreed that they had no real method for deciding when and how to effectively use technology to show content.
The data indicated that a lack of pedagogical experience and understanding of different teaching strategies was a major issue in developing one’s TPACK. While teacher education programs can effectively convey theoretical, methodological and technical knowledge skills, preservice teachers’ lack of direct teaching experience limits them from effectively using or integrating technology into their lessons (So & Kim, 2009; Chai, Koh & Tsai, 2010). Results suggest that modeling an effective use of technology throughout an ITE program is necessary. This can be realized through the introduction of specific exercises and activities so that teachers can gain some experience prior to starting their practicum placements. Otherwise, technology integration may be viewed to be an exceedingly laborious process (Bandura, 1977, in Foulger & Slykhuis, 2013).

2.2.2 The SAMR model

Like TPACK, the SAMR model also seeks to investigate how technology can be successfully embedded in educational contexts (Bambury, 2013). Developed by Puentedura (2010), SAMR is a two-phase approach that includes four progressive stages known as substitution, augmentation, modification and redefinition (Bambury, 2013). With its emphasis on student-centered learning and engagement, this approach has roots in the work of earlier educational theorists such as Dewey, Vygotsky and Piaget (Bambury, 2013). The SAMR model provides a visual representation of the path that technology adopters often follow as they journey through teaching and learning with technology (Technology is learning, n.d.). The goal of SAMR is to support instructors as they work to design, develop and incorporate technology to support higher levels of learning achievement (Classroom connections, n.d.)
The SAMR model consists of four levels, which are divided into two phases that gradually increase in both complexity and effect (Classroom connections, n.d.). The first stage is called substitution where no real change can be detected in the teaching and learning process. Technology is simply used as an alternate way of producing a similar result. One example of this would be using a word processor to prepare an assignment. When instructors are ready to move beyond this basic implementation, they will enter the second stage, which is augmentation. At this point, technology becomes a tool that is used to perform a common task (Technology is learning, n.d.). Possible uses include the embedding of clipart into documents or assigning online quizzes instead of paper and pencil tests. This level also differs from substitution in that both instructors and students can receive timely feedback, which may encourage students to actively engage in their own learning (Technology is learning, n.d.).

Phase 2 is significant in that it marks a transition from merely enhancing classroom activities to actively transforming the student learning process (Technology is learning, n.d.). The third level of SAMR is known as modification. At this point, assignments require
technology in order to support and promote greater levels of student collaboration. One example is the use of a class wiki where students can cooperatively write, edit and comment on one another’s work. In addition to ongoing feedback and engagement, this type of collaborative workspace also encourages knowledge co-construction. The fourth and final level is redefinition. Here, technology is used to perform tasks that would otherwise be impossible prior to computer integration. It marks the apex of Puentedura’s model where multimedia such as Prezi, iMovie, Powtoon and other programs are used to communicate and share student learning. At this level, sharing with larger audiences is possible along with opportunities for peer assessments and teamwork.

2.2.2.1 Using SAMR in virtual learning environments

The SAMR model presents a way for educators to combine their knowledge of curriculum with technology. This next study describes how ITE students and instructors at a Ugandan university are adopting SAMR in virtual environments.

Jude, Kajura & Birevu (2014) used a mixed research approach for their comparative study of staff and students at Makerere University. They used the SAMR model to explore the causes of slow pedagogical integration and suggest ways of moving ICT from an enhancement tool to a transformative one. Qualitative and quantitative data were collected using a questionnaire, interviews, focus groups, observations and blogs. 208 participants from each college responded for a response rate of 35%.

The data first analyzed the ways in which staff and students used ICT. Even though it has existed for over ten years, the Makerere University Electronic Learning Environment (MUELE) database ranked sixth behind personal computers (85%) and the Internet (58%) in terms of frequency of use. Despite this, 64% of staff felt that ICT made teaching and learning
64% noted the existence of an ICT policy that encouraged pedagogical ICT use. 53% of staff reported that they had attended pedagogical ICT training and 41% indicated that regular training was available.

The researchers also explored how ICTs are used at each level of the SAMR model. 74% of lecturers said that they used substitution ICTs, specifically word processing, to prepare their notes, assignments and exams. For augmentation ICTs, 77% used search engines like Google for academic research while 59% used word processing editorial tools. SAMR’s third step involves modification with 28% of lecturers assigning Internet-dependent work. While 29% sometimes taught course modules using MUELE, 63% admitted to never having used it because more time was needed (14%), they lacked computer access (14%), they never thought to use it (5%) or they simply didn’t know how to use it (5%).

The final stage of SAMR is redefinition and 63% of respondents agreed that they sometimes (45%) or always (17%) asked their students to make notes from discussion threads in MUELE. 37% never asked their students to make their own notes and attributed this to a lack of knowledge about MUELE’s functionality (29%), a preference for teacher-centered learning (24%) and low participation levels in online discussions (10%).

The researchers also refer to an emerging educational technology called Massive Open Online Course (MOOC). A MOOC allows students from any college or class to access a course even though they may not be officially enrolled in it. Survey results showed that 20% sometimes use MOOCs. 78% had never used a MOOC because they didn’t know how to use it (40%), were not aware of it (15%) or that MOOCs were not yet available (10%).
The study concluded that the number one reason for the non-use of several ICTs is a lack of knowledge. Three other reasons are given, including:

1) a lack of a strong, vibrant unit that can push for implementation

2) the non-availability of relevant infrastructure

3) a lacklustre implementation of educational technologies policies

These four issues must be examined carefully if any institution of learning is to excel in pedagogical integration.

2.3 Internet-based distance education

This section will address distance education in the context of virtual learning environments. It will also explore how CMC tools function to support learners in their interactions and engagement with one another.

2.3.1 Online education and computer-mediated communication

Today the Internet provides learners with a variety of different options to assist in the development of interpersonal relationships. Known as CMC or web 2.0 tools, they include text, video and audio programs that are used to form connections through the creation of virtual identities. However, Eastmond (1995, in Swan, 2002) cautions that socializing in digital contexts depends on several factors including the frequency, timeliness and nature of one’s communications. If these three factors are not consistent or clear, Moore (1980, in Oztok & Brett, 2011) suggests that a reduced sense of community and a lack of cohesion can result. This in turn can lead to feelings of disconnection, isolation and distraction along with the perception that one is being ignored (Moore, 1980 in Oztok & Brett, 2011). With this in mind, CMC tools
need to be incorporated in an inviting way so as to encourage learners to use them regularly for their social interactions.

Online interactions between students and instructors are essential if a sense of engagement and belonging is to grow. This is an important issue that calls for the development of a social climate so that students will feel like insiders in their virtual environment (Newberry, 2009; Oren, Mioduser & Nachmias, 2002). For this happen, however, participants must consider the social behaviours of smiling, nodding and winking among others and be prepared to experiment with online variations (Shea & Bidjerano, 2010). Active engagement with peers, instructors and course content is necessary if students are to reduce their anxiety levels and fulfill their learning potentials (Aragon, 2003; Ryle & Cumming, 2007). After all, according to Conrad (2005), everyone is a mystery online until they disclose something personal.

As course leaders, online instructors must be prepared to set a positive tone with their students from the first day of classes. This can be achieved through the introduction and modeling of CMC behaviours to encourage a trusting and respectful environment. Some of these affective strategies may include posing questions, providing quick feedback and inviting others into conversations (Aragon, 2003; Conaway, Easton & Schmidt, 2005; Conceiao, 2006). However, social engagement and interaction are not the sole responsibility of instructors. A significant investment of time and emotion from students are required as well. When positive social interactions are initiated and sustained over a period of time, Aragon (2003) notes that learners will begin to feel comfortable.

A wide selection of CMC tools is currently available to empower distance learners and support active online engagement. Some virtual learning environments also feature instant messaging programs for both informal and/or private communications. Visual media can provide
additional auditory and visual stimuli through streaming video, audio, photos, cartoons and clipart. These options can assist students in the development of their perceptions, understandings and constructions of others (Newberry, 2009).

2.3.2 Forms of online communication

Two particular web tools that are now considered to be standard features in course design include threaded discussions and real-time chat (Shen & Kahlifa, 2008; Newberry, 2009; McInnerney & Roberts, 2004). Both will be examined in this section.

2.3.2.1 Threaded discussions

For years, verbal discussions in face-to-face classroom settings have been the preferred instructional strategy (Waltonen-Moore, Stuart, Newton, Oswald & Varonis, 2006). Fortunately, students in virtual learning environments are not limited to specific locations in order to engage with one another. People can interact anywhere and at any time that is convenient to them using threaded or asynchronous discussion formats. Depending on the design and layout of a course, a series of forums can be created where students can view messages that are posted by date and subject. Any note can be accessed and read simply by clicking on its title. The content of the selected message is then revealed in a new window and typically remains visible in the forum until the end of the course. Discussion threads are created when members read various postings and choose to respond directly to the content by clicking on the reply button. Asynchronous communication can also exist in the form of email exchanges, which allow for the sharing of more personal information (Garrison, Cleveland-Innes & Fung, 2004). In fact, email is a valuable tool for those who connect with friends and colleagues at all hours of the day or night (Garrison et al, 2004).
Online discussion forums offer several benefits for virtual learners. First, they allow everyone to participate at any time through the simultaneous posting of notes (Hewitt, 2005). This feature effectively eliminates the classroom practice of raising one’s hand and waiting diplomatically for a turn. Students can freely contribute their ideas without restraint or interruption and concepts can be revisited and shared from multiple perspectives (Riel & Sparks, 2009).

Threaded discussions are not time sensitive, thereby affording people time to read, respond and reflect in greater depth before sharing their ideas publicly (Hewitt, 2005). This can serve to support reflective learners who may have difficulty balancing their listening and thinking processes (Riel & Sparks, 2009). As a result, discussion forums tend to create a certain mindfulness among students, which can lead to the development of a culture of reflection (Swan, 2002). These discussion forums are also thought to enhance critical thinking, which is key to meaningful and memorable learning experiences (Brown, 2002; Riel & Sparks, 2009). Another benefit of these forums can be seen through the creation of individual discussion boards where members can meet. This gives students another opportunity to independently form study groups, establish professional contacts, debate topics and behave just as a class would if it was being held in a regular classroom (Xie & Ke, 2011). Many of these forums have been designed to keep digital records of all plans and strategies for future reference (Xie & Ke, 2011).

Asynchronous communication also supports social engagement through the creation of lounge areas and other spaces that encourage socialization and online camaraderie. This feature welcomes students to share personal information about their families, hobbies and interests (Ascough, 2002). The existence of these shared spaces increases the likelihood that people will share personal details over time and at their leisure (Ascough, 2002).
It is clear that asynchronous communication offers a variety of benefits for online learners. However, the environment that was once perceived to be cold and alienating still has its challenges. One obstacle relates to the fact that this text-based medium does not support voice intonations, inflections, gestures and body language (Kear, 2010; Oren et al, 2002). Understandably, the absence of these cues can compromise the development of a positive social climate, which in turn can lead to misunderstandings and poor online relationships (Oren et al 2002). People who struggle with text-only formats may feel overwhelmed and think that the high energy level required for this level of communication may not be sustainable in the long term (Ascough, 2002). The resulting frustration can very well change the tone and ultimately, the social dynamic of a community (Ascough, 2002). In light of this reality, online instructors are challenged to select additional methods of interaction to support more personalized reactions. These can include the introduction of emoticons such as the popular smiley faces (✿) or acronyms (ROTFL = rolling on the floor laughing).

Two other issues exist which can compromise affective online communication. The first involves low levels of computer bandwidth or low data transfer rates (Swan, 2002). When compared to media featuring a higher bandwidth, asynchronous CMC revealed a lower level of social presence (Swan, 2002). The same was noted when it was compared with real-life, face-to-face exchanges. The second relates to the quantity of postings that are generated within a particular forum. Subjects that generate multiple threads can create anxiety for those who struggle to decide which messages to actually read. Instructors can eliminate this problem by clearly articulating guidelines for the reading of notes. This is also something that instructors and students can collectively embrace in the spirit of maintaining a thriving online atmosphere where time efficiency is valued.
2.3.2.2 Real-time chat

The second method of text-based communication that is used to support online social interactions is real time chat or synchronous communication. Some examples include Windows Live Messenger and the former ICQ (a play on the words I Seek You) where participants can engage socially in real time. It is distinctly different from threaded discussions in terms of its immediacy features. By definition, immediacy refers to specific behaviours that encourage feelings of closeness between people such as body language, eye contact and humour, among others. In terms of online learning, however, these particular examples must be replaced with others that can actually be used in online contexts. Non-verbal and other types of immediacy behaviours will be discussed in detail later.

Live chats are usually set up at a particular time and for a specific purpose such as a project discussion or group conversation. They can be made accessible to everyone or they may require a private invitation. Typically, students click on a designated button or tab in order to access a chat room. When one is selected, participants enter via a new window and once inside, list of active participants is available for all to see. Messages are typed in a chat bar, which is usually found underneath an embedded text window. A message can be posted immediately by clicking on the “send” or “post” button.

It has been suggested that, through the regular use of synchronous media, a sense of social presence will begin to develop (McInerney & Roberts, 2004; Newberry, 2009). Kear (2010) believes that this is due to the immediate nature of chat as questions or comments are usually responded to within seconds. Reducing the time lapse that often occurs between a statement, question or response can lead to improved participation levels, which in turns helps to
foster a greater sense of community (McInnerney & Roberts, 2004; Butler, Sproull, Kiesler & Kraut, 2007).

Similar to its asynchronous counterpart, synchronous communication also presents its own unique set of benefits and challenges. One positive aspect mentioned earlier is its immediate nature, which allows for prompt interactions and the delivery of efficient feedback. Synchronous communication can also assist in the formation of one’s online identity or sense of self through the use of emoticons, Internet slang, acronyms and informal dialogue. Learners must be aware, however, that problems may still occur, especially when one’s tone and intent are not included in these electronic exchanges. Flaming people or insulting them online can happen as a result of misinterpreted text.

A second obstacle to consider is that live chats are not designed for deep, individual reflection. In this type of learning environment, ideas must be posted quickly and within a certain time frame if they are to be read by others. Although many synchronous forums provide transcripts, this is not yet a standardized design feature. Consequently, any work or discussions that take place in live chat rooms may not always accessible for reference later. A third challenge involves multiple participants who engage in separate conversations simultaneously. Maintaining the integrity, flow and thread of a conversation can be compromised if one is not adept at scrolling up and down in a text window in order to read and respond to others’ thoughts. Consequently, live chats are often characterized by short phrases and partial, sometimes fractured thoughts as opposed to the structured sentences and paragraphs that are seen more often in asynchronous forums.
2.3.3 Visual media

Today, more than ever, the Internet offers a wealth of CMC tools to support, encourage and promote virtual interactions (Woo & Reeves, 2007). This new technological reality reflects a communication evolution of sorts, given the fact that earlier studies had dismissed virtual environments as insufficient for community development (Oztok & Brett, 2011). This perspective, however, completely ignores the “Net gen” (internet generation) or those under the age of twenty-five who embrace multiple forms of interactive media. These are students who cannot imagine life without computers (Oblinger, 2003; Woo & Reeves, 2007).

Current technology offers learners access to an enormous amount of media tools including text, email, graphics, multimedia, streaming audio, video, instant messaging, audio conferencing and web white boarding in various combinations (Yang, Tsai, Kim, Cho & Laffey, 2006; Whipp & Lorentz, 2003; Woo & Reeves, 2007). Recent developments in the field of virtual reality include gestures, costumes, voice intonation and other forms of body language that have been typically limited to real-life learning experiences (Anderson & Dron, 2011). All of these methods can be used for the purposes of better instructor-student and student-student interactions (Ascough, 2002; Woo & Reeves, 2007). The decision to move mediated environments away from text-based platforms has resulted in differentiated online experiences and new ways for participants to socialize with one other (Oztok & Brett, 2011). However, these new media forms still differ from their face-to-face counterparts in terms of their media richness (Swan, 2002). This term describes the different ways that affective communication using nonverbal and vocal cues is expressed through different media (Swan, 2002).

Online learning is said to be at a disadvantage with its inability to support verbal immediacy behaviours (Schutt, Allen & Laumakis, 2009). However, audio and video enabled
computer conferencing tools are two types of visual media that allow students to be both heard and seen online. Several investigations have explored the impact of media on social interactions, personality development and the acquisition of information skills (Woo & Reeves, 2007). One study examined the use of mini audio presentations (MAPs) as effective facilitation methods in online communities (Dringus, Snyder & Terrell, 2010). Instructors posted several MAPs spanning three to eleven minutes in discussion forums to enhance their visual identities (Harvey, 2005).

Today, many instructors now use MAPs and short video clips to create a personal touch as well as to encourage a high level of immediacy. Nardi et al’s (2000, in Kear, 2010) study on the use of instant messaging in the workplace suggests that it can be successfully used to maintain a sense of connection with others. These studies indicate that students who use powerful communication tools in web-based learning environments can socially connect with others in meaningful and memorable ways.

2.4 Social presence

By definition, social presence is a method that is used to understand how students develop closeness among themselves. In face-to-face classes, this can easily be achieved through body language and other visual cues such as facial expressions and laughter. In virtual environments, however, these methods are useless, as students cannot see or speak directly to each another. Consequently, the ways in which online social presence manifests itself must be understood to ensure the development of a successful virtual learning environment (Kim, 2001). Over the course of its thirty-year history, researchers have tried to explain how social presence contributes to communication and engagement in cohort groups. However, any discussion about
the construct of social presence must first begin with an examination of what it is and how it has been interpreted throughout the years.

2.4.1 Definitions of social presence

Social presence has been and continues to be a topic of great interest and research in the academic literature. It was initially developed to explain how a communications medium affects the ways in which people communicate (Lowenthal, 2009). The fascination with this complex construct has resulted in numerous interpretations and explanations over the years. As a result, a universal definition of social presence has yet to exist. Despite this reality, however, several explanations are offered herein for consideration.

When Short, Williams & Christie first introduced their concept of social presence in 1976, they defined it as the ability of students to project themselves emotionally into a community of inquiry (Weinel, Bannert, Zumbach, Hoppe & Malzahn, 2011). Other explanations quickly followed, with social presence described as the degree to which a person is perceived as real in online contexts (Cobb, 2009). Picciano (2002) defines it as one’s sense of belonging to a course despite an absence of vocal tone and body language. Another explanation suggests that social presence reflects the personal connections of members that are forged within an electronic community (Ivancevich, Gilbert & Konopaske, 2009). Tu (2000) feels that it is a degree of person-to-person awareness. One final interpretation of social presence likens it to the feeling of being connected by CMC (Lowenthal, 2009). While researchers have yet to reach consensus on a firm definition, there is still hope that one will eventually be defined since a great deal of similarity among the above explanations is obvious.
2.4.2 Benefits of social presence

Social presence supports the development of online community in two distinct ways. First, it promotes and creates a positive learning atmosphere. It also helps to develop an understanding of how telecommunication takes place between learners (Tu, 2000). This next section will examine both of these areas.

2.4.2.1 Positive learning atmosphere

If students are to feel comfortable enough to want to share ideas and exchange views, they need to feel a connection with others. This can be achieved through the formation of a supportive online climate where feelings of openness, group cohesion and trust are encouraged. Various activities and tasks can also help students interact through the support of various technological tools. Once these relationships begin, members will start to feel confident enough to move from a position of isolation to one of collaboration and communication (Garrison et al, 2004; Kear, 2010; Garber, 2004). Learners can let their guard down and not feel vulnerable (Kear, 2010). This does not mean, however, that social presence should be mistaken for a type of superficial politeness. Students should feel as if they can respectfully question their colleagues and offer constructive criticism without having to worry about offending someone (Kear, 2010).

Social presence has been credited with improving instructional effectiveness in both face-to-face and online classes (Tu, 2000). This is encouraging, given that researchers have wondered how virtual social presence can resemble face-to-face interactions (Pfeiffer & Wachsmuth, 2008). High levels of classroom social presence can build trust and lead to self-disclosure (Gunawardena, Wilson & Nolla, 2003). This in turn creates a learning environment that is perceived as warm, collegial and approachable (Newberry, 2009). In virtual environments, a high degree of social presence is synonymous with an interactive environment (Mykota & Duncan,
Conversely, if social presence levels are perceived to be low or nonexistent, learner frustration, poor interpersonal interactions and a lack of contributions can result (Mykota & Duncan, 2007). In order for a learning experience to be both meaningful and memorable, social presence must be developed, maintained and monitored on a regular basis.

### 2.4.2.2 Interaction among learners

Learner-to-learner interactions are a new dimension of online education whose importance cannot be overlooked (Newberry, 2009). Given the isolated nature of virtual environments, the ability to create connections is a skill that all students must develop (Newberry, 2009). After all, people feel more comfortable around others when they can relate to them and share common values. Gunawardena et al (2003) found that taking time to build relationships with others can enhance the level of online civility. One disadvantage of developing close online friendships, however, is that once you become friendly with someone, the tendency to want to question his or her work may diminish (Gunawardena et al, 2003). This resulting lack of criticism may lead to less constructive discussions among students and instructors (Gunawardena et al, 2003).

### 2.4.3 Social presence and online isolation

Current research literature indicates a growing interest in social presence and online education, with researchers wanting to know more about student behaviour. One particular aspect that is garnering attention is online isolation where some students are simply unable to engage with others. This lack of connection prevents feelings of trust from developing and as a result, students end up feeling left out from their social group. To this end, student isolation is an important challenge to overcome in order to secure online community development (Groen & Li,
2005). Social presence can address this issue through an emphasis on the three aspects of interaction, immediacy and identity.

2.4.3.1 Interactions

In any learning situation, interactions are a fundamental part of knowledge acquisition and social skills development (Woo & Reeves, 2007). The three types of interactions that take place both face-to-face and online are student-student, student-instructor and student-content (Moore, 1989, in Woo & Reeves, 2007). In virtual contexts, interactions are viewed as reciprocal events that occur when students respond to, negotiate with, debate and problem solve with one other (Woo & Reeves, 2007). The finding that various media such as audio and video can further support online student interactions resulted in the proposal of a fourth type of interaction known as student-interface (Hillman, Willis & Gunawardena, 1994, in Woo & Reeves, 2007).

2.4.3.2 Immediacy

The concept of immediacy involves three communication behaviours that enhance nonverbal interactions and closeness with others (Baker, 2004). These behaviours include voice, gesture and facial expressions. Other verbal expressions can include inquiry, concern, inclusiveness, encouragement and recognition (Schutt et al., 2009). Gorham (1988, in Baker, 2004) expanded upon this definition to include humour, personal experiences and the use of vocatives or nicknames. Just as social presence can be defined in numerous ways, multiple interpretations of immediacy also exist. One definition states that it is the psychological distance between two people in a conversation (Wise, Chang, Duffy & del Valle, 2004). This view is supported by Chizmar & Williams (1998) who also feel that immediacy is the degree of closeness that exists between communication and the objects of communication. In face-to-face classes, immediacy behaviours like body movements and eye contact support affective
interactions and increase social presence levels (Swan, 2002; Hostetter & Busch, 2006; Rourke, Anderson, Garrison & Archer, 2001). While the impact of these examples can get lost online, immediacy is still essential for those who are expected to communicate without physical cues (Rourke et al, 2001). In this way, immediacy research in traditional classes also has implications for virtual learning contexts (Swan, 2002).

Online immediacy behaviours contribute to instructor-student relationships by enhancing social bonds and making people appear real online (Conaway et al, 2005). Students are encouraged to develop a unique virtual persona by revealing some personal information about one’s culture, background, hobbies and interests (Gunawardena et al, 2003, Stacey, 2002). Activities like this have shown that the more people disclose about themselves, the higher the likelihood is that others will respond (Rourke et al, 2001). Once a feeling of “realness” is established, it can serve as a foundation for relationship building and students may begin to use compliments, teasing, acknowledgements and other forms of appreciation (Gunawardena et al, 2009; Rourke et al, 2001). Using humour and a personalized signature can also make people feel as if they are among friends. These examples of online immediacy can support social interactions among students by making them appear as real people.

2.4.3.2.1 Instructor immediacy behaviours

Online instructors must incorporate immediacy behaviours if they want to oversee a thriving community of learners (Conrad, 2005). Duncan & Barnett (2010) note that the ways in which instructors model these behaviours can influence student response. Instructor immediacy involves three types of nonverbal behaviours that can help to reduce physical and psychological distance (Rourke et al, 2001, Lahaie, 2007). The first is the affective response, which includes emoticons and repetitious punctuation (!!!!) to make one’s feelings obvious. Self-disclosure and
humour can also be used to initiate student conversation and create positive feelings (Rourke et al, 2001). Sharing personal information is yet another strategy that instructors can introduce to appear relatable and encourage personal connections (Lahaie, 2007).

The second type of immediacy behaviour is the cohesive response where instructors connect directly with their students by continuing a discussion thread or responding to a posting. The third immediacy behaviour is the interactive response, where praise and timely feedback are given and students are called by name (Lahaie, 2007). Instructors may also use phatics or phrases such as “How ya doin’?” and “No problem” to encourage more small talk. The conscious decision to replace pronouns such as “I” and “me” with a collective “we” and “our” also contributes to a sense of community (Rourke et al, 2001).

While these online behavioural strategies are helpful in the creation of a learning community, they are not enough. Instructors must also take the time to understand each student’s technological abilities. This information is necessary as one’s prior computer knowledge or lack thereof can impact the ways in which he or she will relate to others in online spaces (Nehme, 2010).

Immediacy in online environments is key to establishing student-instructor relationships. This next study focuses on the value of affective responses and explores the connection between instructor immediacy and how students perceive their courses and learning.

2.4.3.2.2 The importance of immediacy in online classes

Baker (2004) examined the relationships between instructor verbal immediacy and affective and cognitive learning in online classes. 145 graduate-level students from multiple institutions were invited to complete a web-based survey.
Results showed that students who rated their instructors as more verbally immediate demonstrated a greater positive affect and higher perceived cognition than those who were taught by less immediate instructors. Based on these findings, Baker determined that instructors could significantly influence the online learning process, thereby validating the impact of their role.

Consequently, online instructors should find ways of regularly demonstrating immediacy-producing behaviours in order to promote a collegial environment. Various strategies include the creation of a biographical sketch to model self-disclosure, using reminders, notes and personalized email and responding to students in a timely fashion. Rich media tools like audio or video clips can be also encouraged.

2.4.3.3 Identity

Developing one’s online identity is another powerful way to develop feelings of belonging. Although visual cues are limited in text-based media, students can quickly establish their online presence through the uploading of photos, cartoons, clipart and even animated GIFs. Harvey (2005) encourages students to select a current photo but who are reluctant can opt for generic images such as a pet or geographic location. Any type of image will serve to strengthen one’s online sense of self. Video clips hosted on youtube and other photo sharing sites as well as audio files can also serve to strengthen people’s perceptions of their peers. The development of an online identity not only supports the learning process but also firmly establishes students as integral parts of a growing online community.

2.5 Cohort-based learning

This next section will explore the educational model known as cohort-based learning. It is a method that is regularly being used in various university-level courses and programs.
2.5.1 Cohort definitions and a brief history

A cohort, by definition, is a small group of people who are treated as a unit. When viewed through an educational lens, the term typically refers to a group of students who remain together while progressing through a learning program from start to finish (Rausch & Crawford, 2012; Fenning, 2004; Lawrence, 2002). Cohorts have been described as distinct learning arrangements formed by groups of strangers who are connected by a mutual goal (Barnett, Basom, Yerkes & Norris, 2000; Lawrence, 2002; Reynolds & Hebert, 1998; Greenlee & Karanxha, 2010). Ultimately, cohorts encourage a collaborative learning environment through academic and social connections (Dinsmore & Wenger, 2006).

Interactions can unfold in traditional classroom settings as well as in virtual contexts (Reynolds & Hebert, 1998; Dinsmore & Wenger, 2006). While retreats and team building exercises are effective for face-to-face classes, online environments must incorporate tasks that involve social presence and visual media (Spaid & Duff, 2009; Peterson, Benson, Driscoll, Narode, Sherman & Tama, 1995). The purpose of these activities is to create a stable foundation in order for students to develop meaningful and memorable community relationships (Tisdell, Strohschen, Carver, Corrigna, Nash, Nelson, Royer, Strom-Mackey, & O’Connor, 2004).

With a history that traces back to the 1940s, cohort-based learning is not a new educational concept. Earlier, cohort groups were mainly used at the post-secondary level to prepare people for teaching and administrative positions (Spaid & Duff, 2009). Between 1940 and 1980, cohorts were used occasionally and then nearly vanished from the educational landscape before reappearing once again in the 1980s (Spaid & Duff, 2009, Schulte, 2002). At the university where this investigation took place, a cohort ITE program has been in place since the mid 1980s (Kosnick & Beck, 2001). Despite an inconsistent past, cohorts in higher education
are now growing in popularity as they support collaboration, networking and team building (Lei, Gorelick, Short, Smallwood & Wright-Porter, 2011). All of these skills are all necessary if student teachers are expected to successfully develop and maintain their future social and professional relationships (Lei et al, 2011).

2.5.2 Cohort-based learning models

For the past two decades, the educational community has endorsed cohort-based learning as a promising interdisciplinary model for effective teacher preparation and community building (Prytula & Hellsten, 2011; Dinsmore & Wenger, 2006, Clarke, Erickson, Collins, Phelan, 2005; Smith, 2007). Indeed, cohort experiences can shape students into collaborative, transformational leaders by sharing experiences in a constructivist-like environment (Lei et al, 2011; Prytula & Hellsten, 2011). Seifert & Mandzuk (2006), agree, finding that cohort models support community development in three ways. First, from an instructor perspective, they are easy to organize as students can be grouped in different ways. Secondly, cohorts promote social presence and engagement by emphasizing social interactions, which is fundamental if new social knowledge is to be created (Fenning, 2004).

Finally, cohorts encourage intellectual and academic stimulation through student conversations (Mather & Hanley, 1999). Collaboration is a form of learning where shared problems are explored in order to achieve understanding (Lawrence, 2002). These interactions can take place either face-to-face or online depending on the instructional model that is being used. To meet the needs of different programs and learners, four different cohort models known as closed, open, fluid and hybrid were developed. Each format will be explained in the next few paragraphs.
2.5.2.1 The closed model

Four different models of cohort-based learning exist and are currently being used in various education programs (Fenning, 2004; Reynolds & Hebert, 1998). While they may vary in terms of structure, they all support academic development through social connections (Lei et al, 2011). The first model that will be addressed is called the closed cohort. This refers to a group of students who take all of their classes together in a prearranged sequence (Greenlee & Karanxha, 2010; Reynolds & Harvey, 1998). Courses are preselected with the expectation that students will complete them at the same time. One drawback of this model is that it does not allow for any program flexibility and some students have reported feeling stuck in their groups (Dyson & Hanley, 2002).

2.5.2.2 The open model

The second type of cohort is called the open model, which differs from its closed counterpart as it allows students to enroll in additional classes (Greenlee & Karanxha, 2010). This flexibility gives members the option to enter and exit their cohort at different times, depending on their course selections. It also gives students additional time to complete their coursework should any unforeseen problems arise (Dyson & Hanley, 2002).

2.5.2.3 The fluid model

This third model is considered to be the most flexible as students are free to choose from all available courses in order to meet their academic goals (Greenlee & Karanxha, 2010). With no prescribed structure to follow, students can enter and exit cohort groups whenever they want (Greenlee & Karanxha, 2010).
2.5.2.4 The hybrid model

This format was created to address the challenge that instructors face when teaching large numbers of students. Connecting with students on campus can be challenging for instructors, given large class numbers and diverse student learning needs (Saunders & Gale, 2012). Traditional lecture halls also prevent instructor-student relationships from developing as courses are mainly taught through the dissemination of information (Rausch & Crawford, 2012). In the hybrid model, classes are divided into groups, which are supported by a virtual learning environment to encourage social presence as well as feelings of trust and belonging (Conrad, 2005). These elements are critical if students are to form meaningful personal relationships with each other and their instructors (Rausch & Crawford, 2012).

2.5.3 Advantages and disadvantages of cohort-based learning

Current research literature reveals that cohort-learning structures offer diverse learning opportunities for students (Greenlee & Karanxha, 2010). However, an examination of cohort-based learning would not be complete without an exploration of some of the advantages and disadvantages of this particular model. This next section will address the strengths and weaknesses of cohort learning as they pertain to ITE programs.

2.5.3.1 Advantages of cohort-based learning

Teacher education programs that feature cohort-based learning principles offer numerous advantages, benefits and rewards for students (Smith, 2007; Beachboard et al, 2011; Peterson et al, 1995; Sapon-Shevin & Chandler-Olcott, 2001). They include clear course organization, increased instructor-student associations and higher degree completion rates (Greenlee & Karanxha, 2010). In terms of individual student benefits, two positive effects have been identified. They include the development of academic and professional skills as well as the
formation of community. Both of these effects will be examined in this next section in greater
detail.

The first positive effect that cohort-based learning has on teacher education is the
development of an advanced level of academic and professional skills. As a cohesive unit,
teacher cohorts learn to think critically, solve problems and work as a team, which promotes
advanced reading, writing and oral presentation skills (Greenlee & Karanxha, 2010). The
acquisition of these skills is especially important for today’s 21st century educators (Greenlee &
Karanxha, 2010). Cohort-based learning supports the exchange of ideas, which encourages a
back-and-forth flow of information among students (Lawrence, 2002). Research shows that
metacognition also increases as students are challenged to engage deeply in discussions, make
decisions, offer critical feedback and take risks (McPhail, Robison & Scott, 2008). A cohort
group also encourages self-efficacy, which in turn can contribute to an improved work ethic,
better learning outcomes and higher grades (Mandzuk, Hasinoff & Seifert, 2003; Dyson &

A second positive effect of cohort-based learning is the formation of a community
environment. Two key elements, however, are required as communities cannot and will not
develop on their own. Feelings of belonging, trust and acceptance, all of which define a
community, can be developed with a focus on socialization and collaboration. These two
elements can be nurtured and sustained through various activities, exercises and tasks and are
worthy of closer examination.

2.5.3.1.1 Socialization

In order for successful socialization to occur, students must first feel comfortable among
their co-learners if they are expected to share any personal experiences (Lei et al, 2011). With
this in mind, cohorts can encourage trust development and strong interpersonal connections through various icebreaker and small group activities. As discussed previously, creating a personal identity is an important first step (Maher, 2005, Fenning, 2004). Emotional support will begin to develop once students are able to relate to one another (Lei & Gorelick, 2011, Dyson & Hanley, 2002). The emergence of supportive, like-minded individuals is evidence of not just individual development but of group growth as well (Spaid & Duff, 2009). Successful group socialization can also include friendships, empathy and compassion among members (Knorr, 2011). Once a sense of community is established, students will be more likely to engage in energy building, meaning, they will feel empowered to speak freely without any fear of criticism (Beachboard et al, 2011; Teitel, 1997, Alman, Frey & Tomer, 2012).

2.5.3.1.2 Collaboration

Universities are beginning to reconsider their current teacher training methods as a result of the collaborative benefits of cohort-based learning (Prytula & Hellsten, 2011). Studies indicate that cohorts can foster student cooperation and motivate them to co-create knowledge once they develop their personas and get to know their colleagues (Fenning, 2004; Lawrence, 2002; McPhail et al, 2008). This, in turn, can enhance a cohort’s learning quality and interpersonal relationships (Dinsmore & Wenger, 2006; Barnett et al, 2000; Ross, Stafford, Church-Pupke & Bondy, 2006). Greenlee & Karanxha (2010) found that students value their rich learning experiences as much as cooperating together. Fenning (2004) notes that the social and academic skills that develop as a result of cohort membership may empower students to form new groups later on in their professional careers.
2.5.3.2 Disadvantages of cohort-based learning

While the literature on learning communities is largely positive, the cohort approach in teacher education is not without issues, both face-to-face and virtually (Kosnick & Beck, 2001; Beachboard et al, 2011). Online cohorts have their own challenges as learners find the faceless reality of virtual learning environment to be impersonal (Tisdell & Strohschen et al, 2004). Researchers have recorded numerous stories of cohorts gone wrong, with students likening them to dysfunctional families (Sapon-Shevin & Chandler-Olcott, 2001; Lei et al, 2011). Cohort conflict can be caused by a series of different factors including personal clashes, academic competition and power imbalances, among others (Lawrence, 2002).

Given the amount of time that cohort students spend together, it is not surprising that personal conflicts and dilemmas can occur (Lawrence, 2002; Barnett et al, 2000). After all, socializing with the same people for extended periods of time can stunt the development of new ideas and the acquisition of outside knowledge (Lei et al, 2011). Several situations may develop as a result, especially if students reach an intellectual plateau where they no longer feel challenged (Dell, 2012). Saltiel & Russo (2001, in Beachboard et al, 2001) warn of intellectual inbreeding, which can occur when students are no longer surprised or inspired by one another’s remarks. Group conformity and automatic vision can result from those students who passively accept the views of others and offer no ideas in return (Lawrence, 2002). The formation of cliques are also a possibility when members start to assume what others are going to say and will either acknowledge them dismissively or become resentful (Lawrence, 2002; Lei et al, 2011). In this case, familiarity can truly begin to breed contempt.

One other disadvantage of cohort-based learning is academic competition, which completely defeats the purpose of a cohort experience and can lead to tension, resentment and
ultimately, distrust (Lei et al, 2011; Mandzuk et al, 2003). Intellectual mismatches can also create problems, as seen when certain students begin to challenge an instructor’s authority and knowledge base (Beachboard et al, 2011; Mandzuk et al, 2003). These actions can simultaneously hinder student learning, threaten instructor-student relationships and ultimately undermine the goal of a cohort-based learning experience (Beachboard et al, 2011; Mandzuk et al, 2003; Mather & Hanley, 1999; Lei et al, 2011).

2.5.3.3 Shaping attitudes in cohort-based learning

While socialization and collaboration are two desirable outcomes in cohort-based learning environments, they are dependent upon positive perceptions and attitudes. The following study compares online learners with students in face-to-face classes to determine how cohort-based learning influences attitudes.

Alman et al (2012) assessed one group of students in a face-to-face course and a second group in an online cohort at the University of Pittsburgh’s School of Information Sciences (iSchool). 19 cohort members and 17 on-campus students participated in an online survey that included 55 questions, 18 of which addressed social presence.

In their data analysis, the researchers found that there were key differences in the way that the two groups viewed social presence. 68% of the online cohort group showed a stronger sense of belonging and interaction than their on-campus counterparts did, at 34%. 68% of the online cohort also reported that online or web-based communication is an excellent medium for social interactions while only 18% of the non-cohort respondents agreed. 42% of cohort members found student-student interactions to be difficult, compared to 89% of the non-cohort members. 58% of cohort students had contacted classmates outside of the virtual environment
about non-course related issues whereas only 24% of non-cohort students admitted to reaching out.

The study concluded that face-to-face students do not have the same level of classmate interaction or the sense of belonging that characterizes students in online cohorts. The researcher recommends that further research studies, training and support be conducted to address this matter.

2.5.4 Cohorts and Initial Teacher Education

ITE programs are the first step in an extensive professional ongoing learning process. In fact, Canadian teacher education courses are the bedrock upon which prospective instructors develop their knowledge, skills and practices (Gambhir, Broad, Evans & Gaskell, 2008). Over the last forty years, the Canadian perspective of ITE has shifted from a traditional and passive transmission of skills to a more rounded view of teacher education (Gambhir et al, 2008). This new perspective introduces social constructivist approaches that emphasize individual and group development as well as a global awareness of education today. To that end, ITE programs must introduce and model powerful forms of instruction and collaborative inquiry if teacher candidates are to become effective 21st century educators. ITE programs are currently offered at 55 Canadian universities and until June, 2015, 18 000 students graduated each year (Gambhir et al, 2008). Given that the teacher education is an involved process, it makes sense that universities want to investigate an effective model that will continue to improve the learning experience for all current and future students.

The professional literature views cohort-based learning as an adult model that is characterized by affiliation and a strong sense of purpose (Greenlee & Karanxha, 2010). Adults are ideal candidates for cohort-based learning as they are intrinsically motivated, self-directed
learners who can draw upon their prior knowledge (Kosnick & Beck, 2001). Existing literature indicates a high degree of cohort support from the university participants themselves (Scribner & Donaldson, 2001; Kosnick & Beck, 2001). In fact, the body of literature examining the effect of cohorts on students and programming has grown thanks to earlier research that focused on group dynamics and adult learning (Barnett et al, 2000).

In order for cohorts to enhance student learning, they must develop and maintain a strong sense of community (Dinsmore & Wenger, 2006; Knorr, 2011). A cooperative learning environment can be realized through the introduction of different activities and experiences that encourage socialization and unity (Wheelan & Lisk, 2000). Emphasizing group cohesiveness is an essential aspect of group behaviour and members must understand the importance of getting along if they are to develop a strong support system (Lei et al, 2011; Greenlee & Karanxha, 2010). Only then will it be possible for rich, learning experiences to occur (Kosnick & Beck, 2001). Cohort environments create a place of trust where students and instructors can reflect upon their practice and feel safe enough to take risks, leading to greater confidence and satisfaction (Dinsmore & Wenger, 2006; Alman et al, 2012). In this way, teacher education cohort programs have been described as both a journey towards professional learning and socialization (Knorr, 2011).

Much has been written in the research literature about the concept of teacher isolation and there is a concern that teachers are unable to engage with their colleagues on a daily basis. Working alone can impact teacher professional development and hinder one’s instructional effectiveness (Seifert & Mandzuk, 2006). Consequently, researchers feel that focusing on community can provide greater learning opportunities while also reducing the possibility of intellectual and professional isolation (Dinsmore & Wenger, 2006). Although changes are
already being seen at the school level, the reality is that teacher education today still largely subscribes to a program format that is individualistic in nature. This is due to the fact that the issue of community is not always given top priority in the development and design of teacher education programs (Kosnick & Beck, 2001).

2.5.4.1 The role of cohort instructors

The effects of cohort-based learning programs are felt not only by students but also by the instructors who lead and supervise cohort groups. In order to thrive in these new learning environments, instructors need to consider their current teaching practices and be prepared to make some changes. They must realize that the independence and control that they once had over course design and content is no longer a reality in a cohort learning process (Kosnick & Beck, 2001). Instructors must be willing to relinquish their familiar and traditional teaching methods in favour of a more supportive role (Teitel, 1997; Lei et al., 2011).

Dell (2012) notes that the quality of one’s teaching is actually valued more than the cohort-based learning platform itself. Consequently, instructors’ top priority must be to create a learning environment that offers a rich educational experience (Dell, 2012; Schultz, 2004). Instructors are encouraged to open themselves up and take greater risks in their new role as catalysts for group development and cohesiveness (Lawrence, 2002; Kosnick & Beck, 2001). They are also urged to devote a fair bit of time to activities that can help form effective instructor-student relationships (Maher, 2005). The importance of these social connections cannot be overlooked in the ongoing negotiation of the learning process (Tisdell et al., 2004).

Once a cohort program begins, it is important for instructors to discuss the idea of community and to give it high priority through consistent modeling (Kosnick & Beck, 2001). Introductory activities and icebreaker tasks will enforce the fact that learning will be more
effective if members know each other and develop genuine relationships (Kosnick & Beck, 2001). Some students may find this emphasis to be unnecessary, given their previous experiences in individualistic academic cultures (Kosnick & Beck, 2001). Although this is completely understandable, inclusion must nonetheless be encouraged as everyone is smarter, more ambitious and ultimately, more productive when working in a community setting (Kosnick & Beck, 2001). When members learn to depend upon one another for social support, group synergy can increase significantly (Fenning, 2004).

2.5.4.2 Benefits of cohort-based learning for instructors

Three benefits of cohort-based learning can be noted when instructors embrace new teaching strategies and delivery methods. From an organizational perspective, it becomes easier to disseminate information when students are grouped together in a classroom or virtual environment (Lei et al, 2011). Secondly, once one class ends, many cohort groups will start a new course together, giving instructors an extended period of time to guide students as they work to connect theory with practice (Peterson et al, 1995). Team-teaching in cohort groups is a third way for instructors to offer advice and support to one another (Kosnick & Beck, 2001). These benefits have prompted some instructors to ultimately prefer the cohort-based learning model over the traditional one to which they were first introduced (Lei et al, 2011).

2.5.4.3 Instructor challenges

Although cohort groups offer students several learning benefits, there is still a concern regarding the impact of these groups on the instructors themselves (Barnett et al, 2000). Some instructors have become frustrated and worry about losing their autonomy, creativity and flexibility (Barnett et al, 2000; Lei et al, 2011; Kosnick & Beck, 2001). Instructors may also feel isolated as student dynamics can unwittingly create group leaders or spokespeople in a cohort.
Once a culture of trust and confidence is formed, students may be more likely to tell their instructors exactly what is on their minds, demanding more and even challenging an instructor’s approaches and content (Lei et al, 2011). This can lead to tension and scapegoating when members start to blame instructors for their problems (Radencich, Thompson, Anderson, Oropallo, Fleege, Harrison, Hanley & Gomez, 1998, in Knorr, 2011; Barnett et al, 2000).
Students may perceive them to be incompetent, unreasonable or demanding, which can negatively influence and eventually compromise a group’s dynamic (Mather & Hanely, 1999, in Mandzuk et al, 2003; Lawrence, 2002).

2.5.4.4 Cohort-based learning instructor strategies

The transition from a traditional teaching pedagogy to one that embraces cohort facilitation requires an adjustment period for all involved. Different strategies may be introduced to ensure a consistent quality of teaching across cohorts (Kosnick & Beck, 2001). Three strategies have been raised in the research literature which warrant greater discussion and investigation. They include facilitator modeling, the formation of positive relationships and the meaningful use of technology.

2.5.4.4.1 Instructor modeling

Modeling is a powerful practice that can be used to set expectations for a cohort group. Instructors must first take time to consider how they will present themselves in order to encourage feelings of belonging and trust. Studies conducted by Alman et al (2012) found that cohort students perceived their instructor’s actions to support a sense of community. While this can be easily addressed through activities and tasks in face-to-face classes, a different approach is needed to facilitate an online community. In a virtual environment, instructors must provide
opportunities for participants to get to know each other, share in discussions and pose
provocative questions (Lawrence, 2002).

2.5.4.4.2 Relationship building

Maher (2005) was one of several researchers who examined how cohort membership
impacts student-instructor relationships. Since many instructors today work with students across
multiple classes, they are encouraged to take the time to get to know their students personally by
investing additional time for questions and discussions (Lei et al., 2011; Knorr, 2011). Effective
online relationships can influence student success by way of critical thinking, enhanced
reflection, self-regulation, professional development and effective instructional techniques (Dell,
2012). Once successful relationships have been formed, the next challenge for instructors is to
know when to step back so that community development can progress naturally. Some
instructors have found it difficult to remain silent so that their students can grapple with
challenges on their own (Lawrence, 2002).

2.6 Community development

2.6.1 Transitioning from cohort to community

One current issue that is being debated in the research literature is whether or not a cohort
group can in fact develop into a democratic learning community (Ford & Vaughan, 2011).
Before any discussion can take place, however, these two terms must be clearly understood. A
cohort is a type of minisociety where people assume different roles to ensure group longevity
(Lawrence, 2002). A basic definition for a community is a group of people who live in the same
place or who share a common characteristic. Learning in community describes one’s desire to
voluntarily share and create new knowledge with others through the processes of teaching and
learning (Fenning, 2004). The combination of these actions along with high social presence
levels can lay the groundwork for a learning community. Distinguishing between a cohort and a community is critical, as the mere existence of the former does not always guarantee the development of the latter. Another important distinction exists between a community that is formed in a physical, face-to-face context compared to one that evolves in a virtual environment. This next section will focus on virtual communities in terms of their role and impact on learning. The factors that influence its successful development will also be discussed.

2.6.2 Virtual learning community development

Online communities play a big part in the lives of many Internet users today. Typically, virtual realms are initiated by people with common goals, beliefs and values (Bishop, 2007). Their ongoing quest for answers, information and companionship demonstrates how community is important to the success of online learning (Bishop, 2007). Over the years, many different explanations for the term have been proposed, including how it relates to education and the workplace. However, just as definitions for social presence continue to evolve, a unanimous explanation for community, particularly its application in online contexts, may not be reached (Conrad, 2005). Generally speaking, the word community refers to a connection that develops over time among members who are committed to a common goal (Conrad, 2005). Its purpose is to foster a sense of comfort through the formation of a safe climate and an atmosphere of trust and respect (Conrad, 2005).

For the purposes of this paper, the word community will refer to a virtual learning community. Rheingold originally defined this term as a place where people seek emotional support as well as a sense of belonging and encouragement online (Ridings & Gefen, 2004). Today, virtual learning communities are growing quickly and becoming commonplace in all areas of society. Their history, however, reveals an evolution that has spanned a time period of
twenty-five years (Lock, 2002). Over the course of a generation, virtual learning communities have been transformed from newsgroups, listservs and virtual worlds to interactive spaces that encourage and support learner engagement (Lock, 2002). Indeed, recent studies acknowledge that in order for successful online learning to occur, a virtual learning community must foster ongoing and consistent social interactions (Conrad, 2005). In this way, virtual learning communities can be likened to emotional scaffolds for different purposes including social networking, knowledge building and professional development.

There currently exists a large body of research literature suggesting different ways in which a virtual learning community can develop (Bishop, 2007). One way is to examine the different features, designs and tools that are available. However, the actual preparation and design of a virtual space does not directly address the feelings and experiences that are needed in order to foster a true sense of belonging. As a result, Conrad (2005) suggests the contemplation of two questions:

1) How does a sense of community develop?
2) Who is responsible for its development?

One study revealed that students overwhelmingly believe that community development is a collaborative effort that should be taken up by both instructors and students (Conrad, 2005).

Although many aspects of building and sustaining community are similar in both face-to-face and online communities, communication patterns do differ online (Lawrence, 2002). The use and availability of web 2.0 tools allow participants to connect with the names that appear on their computer screens (Lawrence, 2002). Learning communities that develop within online cohorts contribute to self-regulated learning as well as improved student outcomes (Dell, 2012).
Another way to form online community is through the introduction of a residential, or face-to-face meeting among students. Distance learners who have taken advantage of such an opportunity have reported higher levels of connectedness and program satisfaction as a result (Conrad, 2005). The value of face-to-face meetings is evident when people are able to meet others in the flesh. Any opportunity for physical connection helps to both convince and reassure people, which in turn can contribute to the growing health of their online community (Conrad, 2005).

The third way that virtual learning community development can occur is when instructors introduce a variety of forming and norming activities (Conrad, 2005). These refer to any activities that can help new learners to grasp basic technical functions and increase their levels of confidence. Online instructors can guide students by giving advice, coaching and providing immediate feedback (Woo & Reeves, 2007). Taking the time to ensure that all learners are comfortable is key as students feel that instructors who create community are passionate about their work (Conrad, 2005). This can influence students’ attitudes in the same way that an ill prepared and absent instructor can undermine a group’s sense of motivation and purpose (Conrad, 2005). It is important to note that a sense of community cannot be made or given but instead requires time to grow and develop. This growth can only be seen through increased levels of comfort, intimacy, self-reliance and self-knowledge (Conrad, 2005).

2.6.2.1 Using online discussions to develop community

Another way to develop a sense of online community is through the presence of verbal immediacy indicators, which were addressed earlier in this chapter. This next study shows how a sense of community develops among online participants.
Swan (2002) examined a graduate-level course in educational computing featuring four modules with three separate discussion areas in each. Instructors initiated discussions by posing questions and students were expected to submit one direct response to the instructor and a minimum of two replies to their classmates.

235 messages posted to 39 different forums were collected as data and coded for 15 different affective, interactive and cohesive indicators. Swan defined affective indicators as personal expressions of emotions, feelings and beliefs. Cohesive indicators were coded as greetings and nicknames and interactive indicators were words that showed agreement, approval and acknowledgement.

From the 235 discussion postings, Swan found 1366 verbal indicators. Nearly half of them (663) were coded as affective, with an average of 2.8 affective indicators per response across all modules. This supports the notion that students adopt verbal immediacy behaviours to compensate for the lack of non-verbal and vocal cues online. The most frequently used affective indicators (254 instances) were paralanguage, with an average of over 1 indicator per response. Paralanguage refers to informal text that is used to convey emotion or emphasis such as emoticons, (:$) punctuation, (!!!!!) capitalization (YOU’RE AWESOME!) and exaggerated spellings (Kewl!). The second most popular affective indicator was self-disclosure, or personal sharing, which teachers use to lessen the gap between themselves and their students (Swan, 2002). Humour was not found to be used much, possibly because it can be misinterpreted in text-based communication.

In terms of cohesive immediacy indicators, Swan coded 235 in total, making them the least used of the verbal immediacy behaviours. Across all modules an average of just 1 cohesive indicator per response was found. With respect to interactive indicators, 468 were analyzed in
total and an average of 2 per responses were found. The most frequently used indicator was acknowledgement, where people quoted from or referred directly to someone else’s message content.

This study revealed that participants in online discussions seemed to use more verbal immediacy behaviours than those working in face-to-face classrooms. The number of cohesive indicators declined while interactive indicators increased, which Swan believes may relate to different stages of community building. Online participants compensated for the lack of affective communication channels by using more verbal immediacy behaviours, which shows the importance of classmate interaction. While Swan acknowledges that her research cannot be generalized, she calls for future research to examine courses involving cohort groups.

2.6.3 The role of learning communities

2.6.3.1 Providing a supportive climate

In an effective learning community, participants recognize that their individual actions can influence a group dynamic (Lawrence, 2002). Consequently, all members must be willing to accept responsibility for everyone’s growth and well-being, since helping a classmate helps the entire group to succeed (Lawrence, 2002). Although people who join groups are usually connected by a common goal or a shared interest, this is not enough to secure community formation (Lawrence, 2002). Members must first come to know and respect one another’s strengths, weaknesses, similarities and differences (McPhail et al, 2008). Once people realize that their peers will support them, their chances for failure will reduce significantly (Lawrence, 2002). This is an important realization, especially for those students who may feel initially overwhelmed or stressed (Lawrence, 2002). The creation of a collective promotes collaborative experiences, which encouraged the academic and social support that is needed for meaningful
learning to occur (Dinsmore & Wenger, 2006). A group can then become a caring and emotional community of learners where students are encouraged to take risks in order to improve their critical thinking and communications skills (Beachboard et al, 2011; Fenning, 2004).

2.6.3.2 Community advantages

Lawrence (2002) shares three requirements for cohesive community development that he feels should be a top priority. The first one is interdependence, where cohort members rely on one another for assistance and support. Members are valued for their knowledge and experiences and engage in a give-and-take relationship with their colleagues. The second requirement addresses one’s openness to others’ experiences and cultural identities, which influences the roles and forms of interaction that people will adopt (Fenning, 2004). The third requirement involves a deep sense of commitment because when group commitment is high, the potential to co-create knowledge, make decisions and effect change in community becomes possible (Lawrence, 2002). These three requirements appear to support the belief that a cohort model can foster community through intellectual and academic stimulation as well as through social presence and engagement (Seifert & Mandzuk, 2006).

2.6.3.2.1 Social climate development through messages and interactions

Once members of a community feel comfortable with one another, they will be more likely to contribute to its social climate by posting messages and participating in discussions. A series of five studies were conducted by Oren et al (2002) to explore online social climate issues. Studies #3 and #4 will be discussed here as they are relevant to the current investigation.

Study #3 compared a hybrid online environment with a distance-learning (fully online) course. Both courses featured a virtual cafeteria and a social forum along with several other
course-related discussion forums. The study focused on the strength of social climate that emerged in the social discussion and content forum areas. A content analysis was performed on 355 student messages, which were classified as relating to either course content or social issues. The social climate strength was calculated by dividing the number of social experiences by the total number of messages that were generated.

The researchers found that the strength of social climate in the online cafeteria area used by the distance learners was higher (M=.82) than the strength of social climate used by hybrid students (m=.39). In content discussions, the social strength was higher in the hybrid class (m=1.41) than in the distance-learning course. These findings show that the hybrid students had access to a real cafeteria where they could chat and as they began to know each other, the virtual social arena became less important. Online students who needed social interactions conducted their exchanges in the content discussion forums, for reasons unknown to the researchers.

Study #4 focused on the interaction patterns in multiple users domain (MUD) classes. The researchers hypothesized that instructor-student and student-student communication patterns in a MUD class are different from those found in traditional classes.

Discussion logs between four instructors and 32 students were analyzed and three types of instructor-student interactions were defined as being instructor-initiated, student-initiated and student-student. Data was compared to findings on verbal interactions in traditional classes made by Pankraz (1967, in Oren et al, 2002) and Flanders (1967, in Oren et al, 2002). The results were also compared to findings from an audio-video conference class (Murphy, 1995, in Oren et al, 2002). When the MUD classes were compared with the results from traditional and audio-video conferences classes, the researchers found that:
• the proportion of teacher talk was lower than in the other two types

• the proportion of student talk was higher

• instructor response was found to be minimal

• The ratio of student responses and initiated talk in student-student interactions was higher.

The results show that it is challenging for instructors to relinquish their traditional role for one of moderation and facilitation. Consequently, students do not have enough opportunities to interact with each other, or actively contribute to the learning process. The researchers suggest that instructors encourage student interactions, provide feedback, appoint student moderators and create a social area to support the development of social climate.

2.6.3.3 Community and the adult cohort model

The adult cohort is a learning model that is being used with greater regularity in both undergraduate and graduate academic programs (Maher, 2005). Evidence of community growth can be seen in the emergence of positive relationships and interactions as well as a cooperative spirit among members (Dinsmore & Wenger, 2006; Lawrence, 2002). Lawrence (2002) believes that one learns to become part of a larger whole or a community of scholars by experiencing the sharing of knowledge (Engstrom, Santo & Yost, 2008; Lawrence, 2002).

Learning communities that are created through cohorts are not limited to or by school hours (Lawrence, 2002). Activity can extend well beyond the classroom environment with participants wanting to talk between classes as well as via phone, email and even at informal face-to-face gatherings (Lawrence, 2002). Students often leave class full of ideas but they need time to process this new information (Lawrence, 2002). Online community access allows
members to take time to reflect upon these new ideas, which in turn helps them to develop a clear sense of purpose (Barnett et al, 2000; Lawrence, 2002).
3 Chapter 3

3.1 Methodology

This chapter will begin with a review of the three research questions that were selected for this investigation. This will be followed by a description of the ITE program and the Pepper virtual learning environment. Several of Pepper’s features and functionalities will be introduced and discussed as well. Next, a brief overview of the participants involved will be provided. The chapter will end with an explanation of the methodology that was chosen for this investigation, namely, the case study.

3.2 Research Questions

The following three research questions have been posited for this investigation:

1) How do the different ITE cohort groups use Pepper in terms of its functions and features?

2) According to instructors, what factors contribute to the development of community online?

3) How do students perceive and use Pepper as an extension of their classroom environment?

3.3 Context

This next section will position the proposed investigation by providing a thorough description of the virtual learning environment that was selected. The two groups of participants who were recruited for this study will also be explored in greater detail.
3.3.1 The ITE program

The ITE program is a ten-month program offering teacher training to students who are seeking future employment in the Ontario education system. With close to 450 admissions each year, the university relies on a cohort model in order to create six classes of approximately 70 students each.

Table 1

<table>
<thead>
<tr>
<th>Cohort groups</th>
<th>Number of students</th>
<th>Number of instructors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort 1</td>
<td>69</td>
<td>12</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>71</td>
<td>9</td>
</tr>
<tr>
<td>Cohort 3</td>
<td>66</td>
<td>11</td>
</tr>
<tr>
<td>Cohort 4</td>
<td>63</td>
<td>9</td>
</tr>
<tr>
<td>Cohort 5</td>
<td>64</td>
<td>13</td>
</tr>
<tr>
<td>Cohort 6</td>
<td>71</td>
<td>13</td>
</tr>
</tbody>
</table>

Cohort groups organize students geographically in order to facilitate upcoming practicum-teaching sessions. Each cohort is assigned two Option Coordinators who teach a few classes on campus while simultaneously acting in a supervisory capacity for their students. Up until 2009, all cohort groups met on campus for weekly lectures focusing on pedagogy and specific subjects such as Language Arts and Mathematics. In 2010, the ITE program integrated Blackboard into each cohort in order to encourage the anytime, anywhere learning that now
defines 21\textsuperscript{st} century education. As a result of numerous and ongoing technical issues, Connect2Create replaced Blackboard in 2011. One year later, Pepper succeeded Connect2Create as the ITE program’s new virtual environment.

### 3.3.2 The virtual learning environment: Pepper

The virtual learning environment that is currently being used to support the ITE cohort program is hosted on a database that is unique to the university. This section will introduce the reader to Pepper’s features and applications. Its ability to track individual student progress will be explored as well.

#### 3.3.2.1 Pepper features and applications

Unlike other corporate-designed systems such as Blackboard, Desire2Learn, MOODLE and Web CT, the database used in this investigation is a research initiative dedicated to the design of educational software that fosters 21\textsuperscript{st} century skills. Pepper is a web-based collaborative workspace where learners can engage in collaborative inquiry. It includes a variety of specialized features, including a fully functional web-based editor with a “What you see is what you get” (WYSIWYG) toolbar.
Figure 3. Pepper's fully functional, web-based editor

full-text search capability,

Figure 4. Pepper's search for notes tool

a word cloud generator,
Figure 5. Pepper's word cloud generator tool

and the ability to embed YouTube videos into notes.

Figure 6. Pepper's youtube video-embedding tool
In addition, Pepper supports social networking through real-time chat, a selection of user avatars, private messaging, a class wall and announcements folders.
3.3.2.2 Pepper as a progress tracker

With up to 70 teacher-candidates in a given cohort group, it can be a challenge for Option Coordinators and instructors to track the progress of individual students over a year. However, the Teacher Reports feature, which is located under the Administration tab, provides a series of Pepper-generated numerical data relating to page hits, sessions, weekly activity, impact analysis and custom report. A brief description of each report is provided in this section.

3.3.2.2.1 Page Hits

The first tool is called page hits, which produces a bar graph detailing the number of Pepper webpages and windows that a student clicks on daily (i.e., in a 24 hour period). Data can also be generated for one week periods up to four months (16 weeks).
3.3.2.2.2 Sessions

The next feature is called Sessions which tracks the number of times that a student logs into Pepper over a specific time period, ranging from 24 hours to 4 months.

Figure 10. Daily page hits for a one-week period (other options are available)

Figure 11. The Sessions option allows administrators to track the number of individual student log-ins over a set period of time (24 hours to 4 months)
3.3.2.2.3 Weekly activity report

The weekly activity report provides instructors with two types of information. Clicking on the Time Online button shows the amount of time that students spend on Pepper each day while the Notes Written button reveals the notes that were generated over a seven-day period.

![Weekly Activity Report Example](image)

Figure 12. The weekly activity report can show student time online and notes written.
3.3.2.2.4 Impact Analysis

The impact analysis report provides numerical data for three forms of student participation, namely, the number of notes written, the number of likes given and likes received. The number of replies that were received is also recorded. Like and reply ratios are also calculated and the results are listed by class so that comparisons between students can be made.

![Impact Analysis Table]

Figure 13. The impact analysis report examines student use of notes, likes and replies

3.3.2.2.5 Custom Report

The custom report generates a detailed list of either individual or group activity for up to ten different report items including the number of words written and time spent online to the number of replies received and notes read. This information can be requested for a particular day or for a longer period of time by clicking on the Date Range buttons. This data can inform instructors about a student’s level of participation, online habits and areas of need for descriptive feedback purposes.
3.3.2.2.6 Summary Report

The summary report gathers data regarding student performance including the total time spent online, notes written, replies, words written and notes read. Replies and notes read are also expressed in percentages.
3.3.3 The participants

The goal of this investigation is to explore how a virtual learning environment supports and complements the learning process in ITE cohort groups. The primary source of data for this study will be drawn from interviews that were conducted with two groups of experienced instructors who have worked and taught in various face-to-face and online programs. This next section will introduce each group in greater detail.

The first group of people consists of three administrators starting with the designer of Pepper, the virtual learning environment that was used in this case study. The second participant is the instructor who first proposed the implementation of Pepper to support the ITE program. Her experiences and rationale for designing this new environment will inform the research in two ways. First, they will describe the challenges that students faced when they were given a new method of communication. Secondly, they may provide insight into the ways in which instructors used and implemented their virtual environments. The third person who contributed to the data collection is an online coordinator who is not currently associated with the ITE program. However, this person has experience in both face-to-face and virtual environments and her thoughts about the benefits and drawbacks of each course format will further inform the research findings.

The second group of people whose individual and collective views will be integral to the research data are the four Option Coordinators themselves. These participants are a select group of education professionals who have extensive classroom experience in all three teaching divisions. Some were seconded to the university from their school boards while others have worked as professors or lecturers at other post-secondary institutions. The Option Coordinator role is a dual one involving teaching one or two subjects on campus and co-facilitating a cohort
group of 70 students. Ultimately, it is the Option Coordinators’ perceptions of Pepper along with the strategies and features that they used which will be of great interest to the research investigation.

### 3.3.4 The case study

In order to examine the ways in which a virtual learning environment can support and enhance cohort-based learning, a case study methodology was selected. Yin (2002) feels that this particular research strategy is ideal for those who are seeking answers to “how” and “why” questions (Baxter & Jack, 2008; Eisenhardt, 1989). It has also proven to be an effective choice in studies where participant behaviour and reactions cannot be manipulated (Baxter & Jack, 2008). As a research method, the case study approach has a well-respected history and has been used in a variety of fields (Creswell, 2007). By definition, a standard case study is used to explore an issue in its natural context within a set period of time (Creswell, 2007; Eisenhardt, 1989; Stake, 1995; Wilson, 2011).

Case studies have been used for different purposes including testing theories, generating new theoretical concepts and providing descriptions (Creswell, 2007; Eisenhardt, 1989). Their flexibility allows investigators to explore one individual case at a time or multiple instances simultaneously (Eisenhardt, 1989; Baxter & Jack, 2008). Case studies use various data sources including archives, interviews, questionnaires, anecdotal notes and observations for the purpose of gathering evidence and highlighting issues (Wilson, 2011). Results are often presented using qualitative data, which relies on thick or rich description. However, case studies also support quantitative or numerical representations as well as a combination of both (Eisenhardt, 1989). In short, there is no simple checklist of criteria against which case study research can be judged (Hodkinson & Hodkinson, 2001).
The evolution of the case study method has resulted in several interpretations that have been attributed to three researchers in particular. The studies of Stake, Merriam and Yin are often cited when case study research methods are discussed (Creswell, 2007). It is important to understand the distinction between these three approaches in order to select the method that is best suited for an impending investigation. According to Creswell (2007), Stake is known for outlining clear procedures and steps while Merriam supports a general approach to qualitative case studies in the education field. Yin embraces both quantitative and qualitative methods.

A qualitative case study explores a phenomenon in context using a variety of data sources (Baxter & Jack, 2008). This approach ensures that an issue is examined through a variety of lenses, thereby allowing for multiple aspects of the phenomenon to be understood (Baxter & Jack, 2008). This is the type of case study that has been selected for this investigation.

Once a method is determined, the case study needs to be carefully defined as being intrinsic, instrumental or collective. Stake (1995, in Creswell, 2007) suggests that if a researcher is interested in a unique situation, she will want to conduct an intrinsic case study. It also suggests awareness that the results may have a limited transferability. The instrumental case study is used to gain insight and understanding into a particular issue. The collective case involves an examination of multiple cases simultaneously. Since the proposed investigation will focus on one issue involving several virtual learning environments, the type of case study that best fits this research project is an intrinsic one.

The case study approach involves four stages as outlined by Stake (1995, in Creswell, 2007). First, a researcher must determine if the case study is appropriate for the problem under investigation (Creswell, 2007). This research aims to examine how virtual learning environments are used to complement cohort-based learning in ITE programs. The articulation of this
particular issue through the use of the word “how” makes the case study method an obvious choice. The researcher must then clearly identify her case, which involves six virtual learning environments that were overseen by 12 different Option Coordinators in the ITE program.

The second stage is to select the type of data that will be collected for analysis. Although Yin (2002) recommends collecting up to six types of information, this study will concentrate primarily on individual interviews, Anova tests, visual representations and an online survey. The next consideration involves the type of data analysis that will be conducted. Case study research offers several methods including holistic, embedded and cross-case analysis. Holistic analysis thoroughly examines an entire case while an embedded analysis concentrates on one particular aspect. Cross-case analysis is used when a thematic analysis is required. After reviewing these approaches, I feel that my analysis will take an holistic approach since I will be examining all six ITE cohort groups over an 8 month period. The final stage is the interpretive phase where the researcher reports on the lessons that were learned from the case. Each of these four procedures is necessary if it is the researcher’s intent to conduct a data rich intrinsic case study.

3.4 Research Question #1

This first question in this investigation will explore how the ITE groups used Pepper’s features to enhance cohort functionality. Answers were gathered using a variety of quantitative data that were taken directly from the Pepper database as well as from an online survey. Five aspects of Pepper were examined, based on their relevance to the research question. They include:

1) Log-in frequency
   -average number of log-ins by the entire community
   -average number of log-ins per student
2) Time online
- average number of log-ins per instructor
- average time spent online by the entire community
- average time spent online per student
- average time spent online per instructor

3) Public note writing
- average number of public notes by the entire community
- average number of public notes sent by students
- average number of public notes sent by instructors

4) Private message writing
- average number of messages students sent to other students
- average number of messages students sent to instructors
- total average number of messages sent by students

5) Note replies
- average number of replies that students received from students
- average number of replies that instructors received from students

3.5 Research Question #2

The second research question in this investigation asks instructors and administrators about the types of factors that they feel contribute to the development of online community. Data was collected using a mixed-methods approach. Qualitative data were gathered from seven audio-recorded interviews where each participant was asked to define online community and reveal some of the strategies that she or he used.

3.6 Research Question #3

The third research question focuses on student perceptions and uses of Pepper as an extension of their classroom environment. Quantitative and qualitative data were collected through the administration of an optional online exit survey consisting of four questions that were structured as open response and multiple choice. Student recommendations and suggestions
for improvement were also recorded so that they could be shared with Pepper’s team of designers.
Chapter 4

4.1 Question #1: How do the different ITE cohort groups use Pepper in terms of its functions and features?

To gather data for the first study, Pepper was programmed to generate aggregated measures of student and instructor activity in each of the six cohorts. The following five analyses were conducted to assess: i) the degree to which the ITE cohort groups used Pepper; and ii) the degree to which the cohorts used Pepper’s core functionality:

1) Log-in frequency analysis: To determine whether students and instructors logged in regularly (i.e. – on a daily basis).

2) Time online analysis: To determine how long students and instructors spent online.

3) Public note writing analysis: To determine whether students are frequently (i.e.– on a daily/weekly basis) posting notes to shared conferences.

4) Private message writing analysis: To determine how frequently people sent private messages to each other using Pepper.

5) Note replies analysis: To determine how often students responded to each other’s notes as a measure of the interaction that was taking place in Pepper.

Please note that in the following five tables, the term “instructor” is used to describe both Option Coordinators as well as the individual instructors who taught face-to-face classes on campus.
4.2 Log-in frequency analysis

The first analysis of Pepper usage was log-in frequency. The word log-in refers to the process that is used to access an operating system, application or database. It requires a user ID and a password and all ITE students were assigned unique log-ins in September prior to the start of classes. Table 2 displays the means and standard deviations across all six cohort groups for three different categories of data:

1) The average number of log-ins made by the entire community (students + instructors)
2) The average number of log-ins generated per student, per cohort
3) The average number of log-ins generated per instructor, per cohort

4.2.1 Log-in frequency results

The selection of this first variable was a logical one as online engagement and interaction cannot take place until one actually logs into the system! To provide context for the results in Table 2, it is helpful to know that there are approximately 203 days in the ITE program. This is based on an eight-month program from September through April, minus two weeks of Christmas holidays and one reading week: 29 weeks in total x 7 days per week. For the purposes of this analysis it was assumed that an average of 203 days and higher would indicate a daily log-in routine.
Table 2

*Average number of log-ins*

<table>
<thead>
<tr>
<th>Cohort groups</th>
<th>Average number of log-ins by the entire community</th>
<th>Average number of log-ins per student</th>
<th>Average number of log-ins per instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort 1</td>
<td>315.49 (185.91)</td>
<td>330.91 (156.03)</td>
<td>234.85 (293.39)</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>263.05 (222.63)</td>
<td>259.07 (207.77)</td>
<td>290.90 (321.13)</td>
</tr>
<tr>
<td>Cohort 3</td>
<td>376.29 (262.47)</td>
<td>398.59 (211.26)</td>
<td>255.5 (444.33)</td>
</tr>
<tr>
<td>Cohort 4</td>
<td>285 (238.45)</td>
<td>312.90 (241.57)</td>
<td>112 (119.99)</td>
</tr>
<tr>
<td>Cohort 5</td>
<td>389.40 (374.94)</td>
<td>419.76 (385.61)</td>
<td>252.79 (296.90)</td>
</tr>
<tr>
<td>Cohort 6</td>
<td>445.17 (378.55)</td>
<td>486.31 (347.91)</td>
<td>239.43 (466.64)</td>
</tr>
</tbody>
</table>

The large standard deviation that is evident in both student and instructor data suggests that some people logged into Pepper much more often than others. Some individuals logged in multiple times per day, while others only logged in a few times per week. Across the cohorts, the average number of student log-ins ranged from 259.07 to 486.31. Students in cohorts 1 through 4 logged in at once per day, or more, on average. Students in cohorts 5 and 6 logged in twice per day, or more, on average.

A one-way Anova test was run to determine whether the cohort differences in log-in frequency were statistically significant. It was discovered there was a significant difference in the average number of community log-ins at the p < .05 level across the six cohorts [F(5, 398) = 4.056, p < 0.001]. There was also a significant difference in the average number of student log-ins at the p < .05 level across the six cohorts [F(5, 398) = 6.458, p < 0.001]. The average number of instructor log-ins across cohorts was not statistically significant [F(5, 398) = 2.044, p <
Collectively, these results suggest that different cohorts had different practices and/or expectations regarding online participation.

Given that the average number of student log-ins exceeded the number of days in the academic year, it is suggested that Pepper was a familiar and well-visited environment across all cohorts. The same was noted in terms of instructor log-ins, with the exception of Cohort 4. The results also suggest that some cohorts used Pepper more intensively than others.

4.3 Time online analysis

Time online refers to the length of time that students and instructors actively spend logged in to Pepper. However, it cannot be calculated with absolute precision. While texting, clicking, scrolling and posting are activities that can be tracked and recorded, data reliability becomes an issue with passive activities such as reading notes and reflecting. It is difficult to distinguish between a passive online student and a person who has stepped away from the computer while logged in. To address this issue, each student’s online time was calculated as the number of seconds between log-in and logout. All periods of inactivity lasting longer than 30 minutes were deducted from their total online time. In these instances, Pepper assumed that the user was absent.

4.3.1 Time Online results

Table 3 displays both the means and standard deviations in hours/minutes/seconds across all six cohort groups for three different categories of data:

1) The average online time spent by the entire community (students + instructors)

2) The average online time spent per student
3) The average online time spent per instructor

Table 3

*Time spent online*

<table>
<thead>
<tr>
<th>Cohort groups</th>
<th>Average time spent online by the entire community in hours/minutes/seconds</th>
<th>Average time spent online per student in hours/minutes/seconds</th>
<th>Average time spent online per instructor in hours/minutes/seconds</th>
</tr>
</thead>
</table>

The large standard deviations in student and instructor online times, particularly in Cohort 6 suggest that some people spent more time on Pepper than others. Across the cohorts, students spent an average of between 42:35:10 (approximately 1.5 hours, or 90 minutes per week) to 83:59:53 (approximately 3 hours, or 180 minutes per week) on Pepper during the year. For comparison purposes, a typical B.Ed. course involves 36 hours of face-to-face classroom time (generally 12 classes of 3 hours each) and students take eight of these courses over an academic year. So the time that some students spent online in Pepper is comparable to the total amount of time that they spent together, face-to-face, in one or two of their courses (i.e., between
36 and 72 hours). The low average time that was spent by cohort 2 students suggests that Pepper functionality was not used regularly. The reasons for this are unclear.

A one-way Anova test was run to determine whether the cohort differences in online time were statistically significant. The results suggest that there was a significant difference in the average online time across cohorts at the \( p < .05 \) level \([F (5, 398) = 11.309, p. < 0.001]\). There was also a significant difference in the average student online time across cohorts at the \( p < .05 \) level \([F (5, 398) = 12.990, p < 0.001]\) and by instructors \( p < .05 \) level across the six cohorts \([F (5, 398) = 12.958, p <0.001]\). This suggests that Pepper was not used as intensively in some cohorts as it was in others. This is apparent in cohort 6, in which students’ average online time of 83:59:53 (or approximately 3 hours online per week) was double that of cohort 2 (42:35:10, or 1.3 hours online per week). Instructor online times ranged from 15:49:26 (or .55 hours per week) to 73:38:08, (or 2.5 hours per week).

It is notable that four of the six student cohorts spent an average of 25 hours more on Pepper than their instructors did over the course of the year. The reasons for this are unclear.

4.4 Public note writing analysis

The term “public notes” refers to the content that students and instructors post publicly to different conference folders. Notes can be used to relay, share and debate course content in the form of questions, discussions and responses. Instructors can also use notes to describe assignments, reports, activities, tasks, challenges and projects. On Pepper, students and instructors are given the choice of designating their notes as public or private. The difference is that public notes are viewable by all cohort members and can initiate discussion threads as a result of multiple responses and reactions. Private notes are only visible to the writer and his/her recipient(s).
4.4.1 Public notes writing results

This analysis examines the number of public notes that were created by instructors and students. Table 4 displays the means and standard deviations across all six cohort groups for the following three categories of data:

1) The average number of public notes posted per community member (students + instructors)

2) The average number of public notes posted per student

3) The average number of public notes posted per instructor

Table 4

Average number of public postings

<table>
<thead>
<tr>
<th>Cohort groups</th>
<th>Average number of public postings by entire community</th>
<th>Average number of public postings sent by students</th>
<th>Average number of public postings sent by instructors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort 1</td>
<td>23 (19.37)</td>
<td>20 (6.98)</td>
<td>39 (43.53)</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>30 (22.90)</td>
<td>28 (5.96)</td>
<td>46 (63.16)</td>
</tr>
<tr>
<td>Cohort 3</td>
<td>26 (16.97)</td>
<td>18 (4.69)</td>
<td>30 (41.55)</td>
</tr>
<tr>
<td>Cohort 4</td>
<td>14 (8.40)</td>
<td>13 (6.36)</td>
<td>19 (15.64)</td>
</tr>
<tr>
<td>Cohort 5</td>
<td>38 (32.24)</td>
<td>36 (10.56)</td>
<td>44 (50.79)</td>
</tr>
<tr>
<td>Cohort 6</td>
<td>34 (65.37)</td>
<td>29 (16.27)</td>
<td>62 (157.74)</td>
</tr>
</tbody>
</table>
The average number of public notes that were sent by students ranged from 13 to 36, or 0.5 to 1.3 notes per week. In comparison, the average number of notes that were sent by instructors ranged from 19 to 62, or .65 to 2 notes per week. It appears that students were writing notes somewhat regularly – approximately one per week – but not in a fashion that would suggest they were having ongoing online discussions with their peers and instructors. The higher number of instructor notes suggests a teacher-directed learning environment.

A one-way Anova analysis reveals a significant difference in the average number of public postings across cohorts at the p < .05 level across the six cohorts \[F(5, 398) = 4,704.112, p < 0.001\]. There was also a significant difference in the average number of instructor postings across cohorts at the p < .05 level across the six cohorts \[F(5, 398) = 14,460.950, p < 0.040\]. This finding is consistent with earlier findings that suggest that Pepper usage patterns varied across cohorts.

### 4.5 Private message writing analysis

On Pepper, private messages refer to text messages that are sent by one person to another, or to a small group of people. Unlike public notes, they are only viewable by the sender and his/her intended recipients.

#### 4.5.1 Private message writing results

In 2013, 250 million text messages were sent each day in Canada (http://www.txt.ca/english/consumer/press.html). The ubiquity of text messages makes private messaging another logical variable to measure engagement and interaction on Pepper. This next analysis focuses on: i) the degree to which students were writing private messages and ii) whether the messages were being sent to instructors or students.
Table 5 data displays the means and standard deviations across the six cohort groups for two different categories of data:

1) The average number of student-student private messages

2) The average number of student-instructor private messages

Table 5

*Average number of private messages sent by students*

<table>
<thead>
<tr>
<th>Cohort groups</th>
<th>Average number of private messages students sent to other students</th>
<th>Average number of private messages students sent to instructors</th>
<th>Total average number of private messages sent by students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort 1</td>
<td>38.24 (28.69)</td>
<td>36.47 (66.49)</td>
<td>74.71</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>30.52 (39.08)</td>
<td>37.00 (80.51)</td>
<td>67.52</td>
</tr>
<tr>
<td>Cohort 3</td>
<td>52.70 (44.69)</td>
<td>44.38 (114.85)</td>
<td>97.08</td>
</tr>
<tr>
<td>Cohort 4</td>
<td>48.38 (50.30)</td>
<td>23.85 (44.43)</td>
<td>72.23</td>
</tr>
<tr>
<td>Cohort 5</td>
<td>83.98 (91.67)</td>
<td>80.44 (143.84)</td>
<td>164.42</td>
</tr>
<tr>
<td>Cohort 6</td>
<td>110.33 (95.02)</td>
<td>54.49 (144.84)</td>
<td>164.82</td>
</tr>
</tbody>
</table>

One interesting finding from this analysis is that the average number of private messages sent by students greatly exceeded the number of public notes that they posted. While the total number of public notes ranged from 0.5 to 1.3 notes per student per week, the total number of messages ranged from 2.33 to 5.67 messages per week (calculated by dividing the minimum and maximum message counts, 67.52 and 164.82 by 29 weeks). Moreover, students were using
private notes to communicate with their instructors as well as with one other. Thus, much of the interaction in Pepper took place privately, behind the scenes. In all cohorts, except for cohort 2, the average number of student-to-student messages exceeded the number of student-to-instructor messages. This suggests that private messaging served a collaborative, collegial or social function among students, in addition to providing them with a means of communicating with their instructors.

Consistent with earlier analyses, there were significant differences across cohorts in the average number of private messages that students sent to other students at the $p < .05$ level [$F (5, 398) = 15.951, p < 0.001$]. Cohorts 5 and 6 made the greatest use of student-to-student private messaging. The average number of private messages that students sent to instructors did not differ significantly across the cohorts [$F (5, 398) = 2.193, p < 0.054$]. Cohort 5 sent twice the amount of student-instructor messages compared to other cohorts.

4.5.2 Students’ private messages by individual cohort: Pie charts

This section will introduce a series of six pie charts to visually represent how often students used private messages to communicate with other students and instructors. Specifically, these charts show the percentages of student-student and student-instructor messaging that took place across all cohort groups. They can be viewed in Figure 16. All data was obtained from the Pepper database.

When students use Pepper’s private messaging tool, to whom are they addressing their messages? Are they communicating with students more often, or are they interacting with their instructors? The pie charts show that with the exception of Cohort 2, students across all option groups addressed over 50% of their private messages to fellow students. Cohorts 4 and 6 demonstrated the highest levels of student-student engagement with 67% compared to 51% of
the students in Cohorts 1 and 5. Private messaging appears to be one of the tools that students used to communicate with one another, but since they only sent a few messages per week on average, they likely used other electronic means of communication as well.

At 45%, Cohort 2 demonstrated the lowest amount of student-student private messaging, which may have resulted from fewer opportunities for group work. It is also possible that these students chose to communicate with one another outside of the Pepper environment using a different social media tool. A third explanation is that the face-to-face connections that were made during class time were not as strong as those that were formed in other cohort groups. Consequently, these cohort members did not manifest themselves online in the same way.
Figure 16. Pie charts showing the percentages of student-student and student-instructor private messages for all cohorts.
4.6 Note replies analysis

Note replies are public notes that respond to other public notes, making them useful indicators of online communal interaction. Notes are organized in threads in which replies are posted directly beneath the original note. This analysis focused on: i) the degree to which replying occurred; and ii) the degree to which students received replies versus the degree to which instructors received replies. Reply patterns where instructors replied to a student or vice versa is arguably indicative of a more traditional instructional model. Reply patterns that involve exchanges between students demonstrate peer interaction and perhaps collaboration.

4.6.1 Note replies results

Table 6 data displays the means and standard deviations of note replies across all six cohort groups for the following two categories of data:

1) The average number of replies that students received from other students

2) The average number of replies that instructors received from students
### Table 6

**Average number of replies received**

<table>
<thead>
<tr>
<th>Cohort groups</th>
<th>Average number of replies received per community member</th>
<th>Average number of replies received per student</th>
<th>Average number of replies received per instructor</th>
<th>Average number of replies that students received from other students</th>
<th>Average number of replies that instructors received from students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort 1</td>
<td>7.8 (6.68)</td>
<td>7.8 (5.59)</td>
<td>6.6 (10.57)</td>
<td>7.52 (13.35)</td>
<td>.89 (1.21)</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>18.0 (12.05)</td>
<td>17.4 (7.84)</td>
<td>21.8 (28.00)</td>
<td>16.38 (14.80)</td>
<td>2.45 (3.73)</td>
</tr>
<tr>
<td>Cohort 3</td>
<td>7.8 (6.10)</td>
<td>8.1 (5.55)</td>
<td>6.3 (8.51)</td>
<td>8.51 (18.30)</td>
<td>1.15 (1.54)</td>
</tr>
<tr>
<td>Cohort 4</td>
<td>10.8 (5.69)</td>
<td>11.4 (4.98)</td>
<td>7.4 (8.51)</td>
<td>11.6 (26.32)</td>
<td>.91 (1.91)</td>
</tr>
<tr>
<td>Cohort 5</td>
<td>26.3 (15.13)</td>
<td>27.9 (11.15)</td>
<td>18.8 (25.91)</td>
<td>26.34 (29.58)</td>
<td>3.38 (2.54)</td>
</tr>
<tr>
<td>Cohort 6</td>
<td>23.2 (18.32)</td>
<td>29.6 (12.70)</td>
<td>16.4 (35.03)</td>
<td>24.51 (59.45)</td>
<td>2.97 (5.53)</td>
</tr>
</tbody>
</table>

Students replied more frequently to other students than they did to their instructors (as can be seen by examine the two rightmost columns of Table 6). In fact, the number of student-student replies was between 7 to 12 times more than student-instructor responses. This might be considered to be an indicator of peer interaction taking place in Pepper. However, it must be noted that the overall number of replies received per community member is low across all cohorts, ranging from 7.8 in cohorts 1 and 3 (only 0.27 replies received per student per week) to 26.3 in cohort 5 (0.91 replies received per student per week). While students appeared to receive many more replies from their peers than from instructors, there appears to be relatively little public interaction taking place.
Across the cohorts, there was a significant difference in the average number of replies received by community members at the p < .05 level across the six cohorts [F(5, 398) = 4,068.939, p <0.001]. There was also a significant difference in the average number of replies received by students at the p < .05 level across the six cohorts [F(5, 398) = 90.144, p <0.001] and by instructors at the p < .05 level across the six cohorts [F(5, 398) = 6.646, p <0.001]. Again this suggests differences in the way Pepper was used from cohort to cohort.

4.6.2 Student replies by individual cohort

A second set of six pie charts will be presented in this section to show the percentages of student-student and student-instructor replies that occurred across all cohort groups. They can all be viewed in Figure 17.

When students create replies in Pepper, are they responding to their fellow students more often or are they answering their instructors? The pie charts indicate that stronger levels of student-student communication took place across all six ITE groups. Cohort 4 again demonstrates the highest percentage of student-student replies with 93%, while cohorts 1, 5 and 6 all report interactions of 89%. In comparison, student-instructor interactions range from 7 to 13%.
4.6.3 Connection diagrams

Connection diagrams are used to display reply relationships in more visual ways. They can be accessed directly on Pepper by clicking on the Windows tab > show connections.
Connection diagrams illustrate each public note reply relationship between individuals (private message replies are not shown). They are automatically generated using an "elastic-band" algorithm that tends to bring the more highly connected individuals to the middle of the diagram, while less connected individuals are displayed on the periphery.

These diagrams show the number of student-student and student-instructor replies that occurred in each cohort group and they can be viewed in Figure 18. Red circles represent instructors while blue circles are used for individual students. Each gray line shows a reply or a connection that was made between two people. Please note that all names have been randomly anonymized in order to protect the identities of all participants.

A comparative analysis of the six connection graphs reveals a number of striking features:

1. The instructors (red circles) tend to be clustered near the middle of the diagram, suggesting somewhat teacher-focused communities. This finding is consistent with the relatively low number of public postings (Table 4) and low level of discourse across all six communities.

2. The higher levels of student engagement in Cohorts 2, 5 and 6 is immediately apparent. These diagrams contain many more lines linking student to student.

3. Cohort 5 appears to be roughly divided into two clusters, joined in the middle by the instructors. This division likely reflects the decision of the Option Coordinators to divide the cohort into two separate classes.
Figure 18. Connection diagrams for all cohorts
4.6.3.1 Summary

In this chapter, five analyses were conducted to assess the ways in which the six ITE cohort groups used Pepper and its core functionality. An Anova test on log-in frequency revealed that Pepper was a well-visited environment although different cohorts had different practices and expectations. A time online analysis indicated that some students spent as much time online as they did in a face-to-face course (36 hours). In fact, students spent 25 hours more on average than their instructors did. The third analysis on public note writing showed that the weekly ratio of average student notes to instructor notes was 1:2. These results do not indicate that ongoing online discussions were taking place between students and instructors.

An analysis of private message writing revealed that student communications using this functionality exceeded their number of public postings. This suggests that private messaging was used as a way to socially connect with both students and instructors. This finding is further supported by a series of pie charts revealing that over 50% of students’ private messages were addressed to other students. The final Anova test was conducted on note replies and revealed that students received more replies from fellow students than from their instructors. The number of student-student replies exceeded student-instructor responses by a range of between 7 to 12 times. Pie charts showed that over 85% of replies across the six cohorts had been sent by students to other students. While this superficially suggests a high level of interactivity among students, the level of note generation is too low to suggest that students were regularly engaging in online discourse.

The six connection diagrams revealed that Cohorts 2, 5, and 6 appeared to be stronger (i.e., more interconnected) communities than Cohorts 1, 3 and 4. In all six cohorts, the teachers tended to be at the centre of the clusters, suggesting somewhat teacher-centered communities.
5 Chapter 5

5.1 Question #2: According to instructors, what factors contribute to the development of community online?

Using online environments to develop community can be a challenge and people have different perspectives on how that process might best take place. The five Anova tests that were described in Chapter 4 reveal that some cohorts appeared to have different expectations and practices regarding their use of Pepper. To gain a greater understanding of these differences, four Option Coordinators were interviewed. It was also important to capture the perspectives of the three administrators or technology “experts” who played a significant role in the development and introduction of the Pepper/ITE initiative. So, in addition to the four Option Coordinators, the following individuals were interviewed:

• Roger, Pepper developer: How did Roger design Pepper to support the development of community? Which features does Roger consider to be community-building features, and why?

• Donna, Option Coordinator and Technology Coordinator for the ITE program: What are some of Donna’s goals for community-building? What was her vision of Pepper’s role in the Teacher Education Program?

• Louise, Communications Coordinator in the Master of Teaching program: As an administrator who supports and uses Pepper in a different academic program, what were her experiences of using the software?
This chapter will begin with an analysis of the interviews that took place with Roger, Donna and Louise, each of whom played significant roles in the development and conceptualization of the Pepper initiative. This will be followed by an analysis of the four interviews that were conducted with the Option Coordinators, namely, Carla, Eleanor, Marissa and Micki.

5.2 A developer’s perspective of Pepper: Roger’s story

Roger’s research has centered on educational technology and the ways in which students and faculty engage in online spaces. Combining his extensive background in mathematics and computer science with his interest in online interaction and coding, Roger created an online environment for both faculty and student use in 2009. This new virtual environment was called Pepper and since its inception, it has been used to support numerous graduate and post-graduate face-to-face, flex-mode and fully online courses. In 2012, it was integrated for the first time into the ITE program, replacing Blackboard as another way for students to communicate and share information.

5.2.1 How does Roger feel that Pepper’s design supports community development?

As Pepper’s creator, Roger was asked to describe how he approached the process of designing an online environment. The questions that were posed to him can be found in Appendix A. Roger explained that the process was a collaborative venture involving a committee of eight graduate students and Donna, a seconded elementary math consultant who first suggested the introduction of an online component to the ITE program. Roger credits her proposed model for providing the foundation for a database that would eventually host six
separate cohort groups. Donna’s role in the collaborative development of these online spaces along with her experiences and insights will be shared later on.

Roger wanted students and instructors alike to log into their online environments and think, “This is our home. This is where we live when we’re online. It’s our cohort”. To that end, he and Donna decided that Pepper’s design would support two goals. First, interaction would be encouraged through the inclusion of two social spaces, namely a Lounge and a Community area featuring a message wall. Secondly, Pepper would offer instructors a variety of online tools for the purpose of creating a distinctive cohort environment. Roger felt that customizing a virtual space to distinguish it from others can help to foster a sense of familiarity and belonging.

5.2.1.1 Shared spaces for online interaction

Once students log into Pepper, they are immediately taken to a split screen page featuring the Community area on the left side. This design feature allows students to quickly identify

Figure 19. The Community window and Wall
cohort members as well as people from other ITE groups. Roger feels that this helps to create a sense of familiarity, which in turn, may contribute to feelings of community. The right side of the screen includes a scrolling message window called the Wall. Here, students and instructors can post comments and information in real time. For Roger, this feature was added to enhance feelings of immediacy and connectedness among the cohort groups.

The Community area and Wall separate Pepper from other learning management systems as they support multiple cohorts in one environment. Roger made this design decision so that students who do not know members in other cohort groups may be encouraged to actually reach out and connect with them via a brief message. In this way, Pepper provides a virtual extension of what is already taking place on campus, namely, the intermingling of cohort groups during on-site classes.

The second way that Pepper’s design supports community is through the Lounge.

Figure 20. The Lounge
It can be accessed through the Lounge tab, a standard Pepper feature located at the top of the webpage. Like the Community/Wall page, the Lounge was also designed as a split screen with the left side indicating the number of people who are currently logged into the system. On the right side, the My Communities section lists all of the hotlinked courses to which one belongs. Clicking on any one of these hotlinks takes students directly into that online environment which features a different learning community. Roger felt that this was another way for students to interact with one another in an online context.

Roger and Donna’s decision to incorporate the Community, Wall and Lounge areas into Pepper’s design reflects their strong desire to encourage community growth. All three of these features provide students with visual and textual reassurances that they are not working alone. Knowing this may help to reassure students while establishing an atmosphere that encourages them to initiate communication with one another.

5.2.1.2 Creating a personalized environment

The second way in which Roger and Donna hoped to build community was through the creation of a personalized Pepper environment. Instructors can customize their cohorts in multiple ways by first clicking on the Administration tab > Settings. This opens up a new window featuring twelve buttons.

Figure 21. The Pepper settings window and title button selection.
Seven of them have been specifically labeled as Title, Welcome image, Banner, Menu Item #1, Menu Item #2, Community and Registration. The remaining five buttons that are called Future will host new options as they are made available on Pepper. Each of these seven features will be described in the next section.

5.2.1.2.1 Pepper’s personalization features

The first option is the Title button, which allows instructors to individualize the names and/or titles of their cohorts through the inclusion of a slogan to promote camaraderie (one Option Coordinator chose “Together we’re better! 😊” while another opted for “Teaching for Tomorrow”) and/or emoticons. Sometimes instructors added the current academic year as well. For Roger, this is an obvious way to differentiate one cohort from another.

The second feature is the Welcome Screen Image, which can be accessed via the Welcome Image button. This feature may be likened to online interior decorating where one’s personal taste can create a welcoming atmosphere.
Figure 22. The welcome screen setting.

Selecting this option provides instructors with two default photos that can be used as background images for the log-in window. Additional images can also be uploaded and stored online once Pepper converts them to 600 x 300 JPEG images.

The third personalization feature that Roger included is called the banner option that is used to set the design that appears across the top of the cohort webpage.
Figure 23. Pepper’s customizable banner setting.

Similar to the Welcome Screen feature, additional images can be uploaded to reflect what Roger described as one’s individuality and distinctiveness. Depending on the image, however, some distortions may occur during the resizing process in order to match Pepper’s banner dimensions.

The fourth option that Roger included is called Menu Items. This involves two separate buttons, which instructors can designate as personalized tabs through the insertion of a web address, or URL. When students click on them, they will lead to specific websites.

Figure 24. The customizable menu item setting shows the creation of a tab which links to a department website.
Roger feels that by assigning these buttons, instructors can call attention to a particular issue or current topic.

The final two buttons are called Community and Registration. Instructors can control whether or not their students will actually be able to access these features through the selection of a radio button (on/off). Roger felt that these features offer instructors some choice and flexibility, especially for those who may feel overwhelmed at first by the number of features that are available.

![Community Button Diagram](image1)

**Community:**

- **On**: This switch controls access to the "Community" feature. When switched "On", the Community button is displayed on the main menu bar. When switched "Off", the "Community" button is not available.
- **Off**: 
- **Our Wall**: 
- **Messages**: 
- **Calendar**: 

![Registration Button Diagram](image2)

**Registration:**

- **On**: This switch controls access to the "Registration" feature. When switched "On", the "Register" button is displayed on the login screen. When switched "Off", the "Register" button is not available.
- **Off**: 

Figure 25. The community and registration settings for controlling student access.

If instructors choose to personalize their Pepper environments using one or more of the above-described features, Roger feels that students entering these virtual spaces will view them as distinctive, unique, familiar and intimate. Two examples of Welcome Images can be seen in Figure 26 and two different banners are featured in Figure 27.
5.2.2 What Pepper features does Roger think enhance community building?

Once Roger realized his two Pepper design goals, his attention turned to identifying and choosing the features that he felt would further enhance community development. First, Pepper should be accessible and intuitive so as to encourage regular visits. This was important to Roger since:

…online communities can often die if no energy is put into them. We need to find ways to keep bringing students back in… (R.R., 2013)

With this reality in mind, Roger named four features that he believes will support student-instructor interactions and the development of community. They include profiles, visual representations, notifications and text messaging. Each one will be described in the next few paragraphs.
5.2.2.1 Pepper profiles

Creating a Pepper profile is one method that students can use to develop their online social presence. It can be set up by clicking on the Preferences tab > My Profile. Students and instructors can identify themselves by their location and time zone as well as through the selection of a personalized icon and the preparation of a brief biography (see Figure 28). For Roger, the creation of a profile brings a person to life through the revelation of some personal information, interests and goals. This form of online disclosure can help people to identify commonalities amongst each other, which may in turn prompt social interactions and greater sharing.

![My Profile](image)

Figure 28. Pepper profile window.

5.2.2.2 Visual representations

Visual representations are another way to foster a sense of community among candidates. People can make themselves visible in online environments in two ways. The first is to choose an avatar or an icon by uploading an image of someone or something that is personally relevant. Roger feels that this is a safe and relatable way of revealing one’s interests and personality. Icons
can range from cartoon images and self-portraits to pets, nature and food. A screen capture of
Pepper’s default icons is seen in Figure 29

![Profile Picture](image)

Figure 29. Standard Pepper profile pictures. Additional photos can be uploaded from the desktop.

Once an image is uploaded to Pepper, it is displayed beside the student’s name and appears
whenever an interaction takes place. Over time, the image will become associated with that
person which helps others to ascertain their online presence. Roger feels that using avatars helps
students to relate to one another, which in turn may strengthen their connections.

5.2.2.3 Notifications

To meet his primary goal of encouraging return visits to Pepper, Roger included a course
notifications feature. Other social media sites may have inspired this as he referred to both
LinkedIn and Facebook in his response. Pepper notifications help students to remain apprised of
updated content changes, new postings and instructor announcements. As a result, whenever a
new announcement is posted on Pepper, students will immediately receive an email in their
personal inboxes with a hotlink that takes them directly into the specific area. Roger believes that
keeping people informed in this instantaneous way will help to maintain students’ engagement
and interest. Consequently, the notifications feature may be viewed as a lifeline to Pepper of sorts.

5.2.2.4 Text messaging

The last feature that Roger felt was key to supporting community development is both individual and group (3 recipients or more) private text messaging. Email addresses and phone numbers, which are normally required for texting are unnecessary as a user-friendly message window pops up when someone’s avatar is mouse-clicked. Roger considered this to be a popular feature as students:

…wrote almost as many private text messages to each other as [class] notes. There was a tremendous amount of private messaging going on behind the scenes, which we thought was really cool. (R.R., 2013)

Roger felt that text messaging can be used in the planning and preparation of cooperative assignments as members can message each another and engage in ongoing dialogue without having to actually meet. Pepper also allows files to be sent back and forth for the purposes of editing and revising work. Generating multiple drafts is not an issue on Pepper, as Roger explained that students:

…could create a word file and then use text messaging to send it to [you]. [You] could then work on the word file and then send it back to me and I could send it back to [you]. And the kind of cool thing about that is that when we go back and review our text discussions, we can actually access all 3 generations of that file back and forth. And each one is preserved. (R.R., 2013)

In this way, text messaging can show evidence of collaboration, which may be used by instructors for assessment and evaluation purposes. Furthermore, all files are safe from deletion as each version of a message is stored on the server.
Roger’s rationales for including the four features of profiles, visual representations, notifications and private text messaging clearly demonstrate how Pepper has been carefully developed in order to enrich community development and complement the ITE program.

5.3 A Technology Coordinator’s perspective: Donna’s story

5.3.1 Background and role as technology coordinator

Donna is currently employed by an Ontario public school board and she has worked as both a classroom teacher and math consultant for fifteen years. Her interest in, knowledge of and previous experience with technology have exposed her to different learning management systems including Blackboard, MOODLE, First Class and Connect2Create. Her extensive experience with both computers and technology-based learning led to a university secondment as a math instructor for the ITE program in 2009. In her first year, Donna recalled that:

We used Blackboard and I just found it really difficult to use as an instructor to upload and download. It really didn’t elicit any type of class discussions and students didn’t like accessing it. So it never really was used. (D.J., July 10, 2013, personal interview)

Shortly thereafter, a switch to the Connect2Create learning management system was made.

While this new collaborative tool was an improvement from Blackboard, Donna felt that many of its features were tedious and time-consuming. Consequently, she wondered how this might impact upon the quality of online discussions and community development. Although class resources were being uploaded on a regular basis, Donna saw little evidence of a developing community of learners. Instead, candidates used the site primarily for the downloading of materials.

The next year, Donna took on the role of an Option Coordinator where she taught three classes and oversaw the activities of one student cohort group. For the purposes of clarity, the
principal organizing structure for the Elementary ITE Bachelor of Education program is a division of students into six Option groups, each consisting of approximately 70 candidates. Throughout this investigation, they will be referred to as Cohorts 1 through 6. Cohort members attend all of their classes together and consequently tend to develop strong interpersonal bonds over the year.

In addition to her new responsibilities as an Option Coordinator, Donna also worked as ITE technology lead, which afforded her the unique opportunity to explore Pepper and experiment with its features for one full year. After that time, Donna and her colleagues met to review Connect2Create’s functionality and performance. As a result of ongoing technical issues and concerns, the collective decision was made that Pepper should succeed the current learning management system in the next academic year. Although this meant that instructors would be required to work with two different databases in as many years, one factor influenced this change. At the time, Pepper was still in a developmental phase and instructors were issued an open invitation to attend monthly meetings in order to share their experiences and make recommendations for improvements. This was an important point for Donna as she felt that including instructors in this process would encourage greater buy-in and support for Pepper.

During Pepper’s first year of integration, Donna worked as an Option Coordinator while also accepting a new role as technology infusion coordinator. Her goal was to support instructors during this transitional period by introducing new technology such as tablets, iPads, SMART boards and electronic pens. She met with them regularly in order to model and encourage the application of new technological forms into their classes and more particularly, on Pepper.
5.3.2 What were Donna’s goals for Pepper?

Once the decision was made to switch to Pepper, Donna shared four goals that she had for this new virtual environment with respect to student engagement and community development. First, Pepper could provide a shared repository for the long-term storage of resources such as PDF (Portable Document Format) files and PowerPoint presentations. Pepper could also encourage interaction through the generation of both threaded and real-time discussions. A third goal involved the use of Pepper’s tracking tools to monitor ongoing student progress. Finally, Pepper could function as a support system for maintaining past and present student connections. Donna’s thoughts about each of these four goals will be revealed in the next section.

5.3.2.1 Goal #1: Create a shared resource repository

The idea of using Pepper as a storage facility for the purposes of sharing of resources and presentations resonated strongly with Donna and her colleagues. By clicking on Windows > Resources, instructors and students alike can access an area called Community Resources.

Figure 30. The Community Resources area for the storage and sharing of materials.
Here, instructors can create and define a number of instructor and student folders that will ultimately become accessible to all 6 cohorts in the ITE community. Instructor folders allow for the separate uploading of course-related materials while student folders encourage members to share their work with their immediate cohort group as well as the larger ITE community. This feature impacted the ITE program in three ways. First, it showed that Pepper could support student learning beyond the physical classroom. Secondly, the accessibility of these files reduced photocopy fees and the need for hardcopies significantly. Finally, Donna reported that her students began to realize that if they wanted information, they would have to log into Pepper in order to download it. This last point marked an important first step for Donna in the development of community, namely, fostering an online group presence.

5.3.2.2 Goal #2: Foster interactions through discussions

Donna also felt that Pepper could encourage feelings of community through the hosting of threaded discussions in different conference areas. In September, she developed and posted a series of icebreaker activities so that her students could familiarize themselves with Pepper and one another prior to the start of classes. It was important to Donna that multiple opportunities for interaction were provided as soon as possible.

5.3.2.3 Goal #3: Maintain connections with alumni

Donna felt strongly that following graduation, ITE alumni should be able to maintain their access to Pepper and continue to receive notifications and updates regarding job postings and career information. In this way, Pepper stands apart from other learning management systems since:

Once [students] graduate they don’t have access to those [learning management systems] so they have to download everything that’s on there before their access is cut off. [But] with Pepper, it’s there forever until they stop. (D.J., 2013)
Those who were interested in receiving ongoing email notifications selected the Preferences tab > Notifications and provided a personal email address once the academic year ended.

![Email notifications setup window](image)

Figure 31. The email notifications set-up window

Although some students did not want to maintain their access, Donna was hopeful that over time more alumni will realize how it can continue to support student-student interactions long after graduation.

### 5.3.3 What was Donna’s vision of Pepper’s role in ITE?

Donna’s rationale to replace Connect2Create with Pepper was motivated primarily by her desire to support and encourage community development in four different ways. First, Pepper would assist with student organization through an online calendar. Secondly, it would support collaboration through its inclusion of shared folders. Next, the introduction of a private messaging tool would facilitate communication between students. Finally, Pepper would encourage individual reflection through the online sharing of presentations. All four of these features will be examined in the following paragraphs.
5.3.3.1 Improving organization: the calendar feature

The Pepper calendar is a collaborative tool that can be used in a variety of ways. Instructors can easily add events, highlight due dates, issue reminders and schedule practicum visits for improved student organization.

[Image of Pepper's monthly calendar feature]

Initially, the calendar was only accessible once students had logged in. However, Donna recognized the importance of mobile devices in the lives of her students and wondered if the Pepper calendar could be programmed to sync with individual smart phones, thereby solving a logistical problem that she was experiencing:

Initially, we would print out a hard copy calendar for our cohort and give it out on registration day. Then we’d have to upload a word document if we had to make any changes. So we’d make those changes and then I’d have to transfer it to my phone or computer or whatever. I would be doing a lot of cutting and pasting. (D.J., 2013)
Donna found a solution when she discovered that it was possible for a Google Calendar to be embedded into a Pepper note. This new method allowed instructors to make changes and add new information directly without having to constantly copy and paste. Google Calendar also synced with smart phones for instant mobile accessibility. Donna reported that:

We made it mandatory that students had to check [Google Calendar for] all information, announcements, any important things…we told them, “You need to check it daily and if you miss information that’s your responsibility and we are not going to be emailing any reminders”. Things like that. (D.J., 2013)

Her successful experiments with Google Calendar inspired the Pepper team to develop new tools to provide students with one-click mobile calendar access.

5.3.3.2 Supporting collaboration: Shared conferences

Donna felt that Pepper’s shared conferences feature would also play an important role in online collaboration. Her desire to support a sense of community both within and across individual cohorts began with her realization that her students may be experiencing challenges similar to those in other groups. When her cohort expressed concerns over the understanding and teaching of mathematics, Donna believed that this was likely a shared issue among other students. Consequently, a group folder called Math Help was created, with several students volunteering to work as moderators and advisors. A group folder or open conference is one that can be accessed across all cohort groups.

Following the creation of this new folder, Donna and her colleagues began to observe that candidates in other cohorts began to access it, initiating discussions and sharing resources. Interestingly, Pepper users outside of the ITE program began to visit and make contributions as well. For Donna, this was evidence of cross-mixing, which is the intermingling of students
across different groups. In response to this growing interest, Donna requested the creation of additional shared conferences. Her hope is that going forward, more participants will generate new discussions and want to contribute to the ongoing sharing of resources.

5.3.3.3 Encouraging communication: Private text messaging

The third role that Donna feels Pepper will play involves communicating and interacting through private text messaging. Text messaging gives students the opportunity to share their ideas and opinions with smaller groups instead through public notes. Donna identified the need for such a feature when she noted little evidence of student-student discussions taking place on Blackboard and Connect2Create. She learned that instead of choosing to socialize on these earlier learning management systems, previous ITE students had created social communities on Facebook. Donna’s concern was that these off-site groups would exclude those students who did not have or want Facebook accounts. She felt that an accessible and user-friendly internal message system would appeal to all students and encourage conversations.

A private text message is created by clicking on the Messages tab on the home page, which generates a new text message window.

![Message Window](image33.png)

Figure 33. Pepper’s private text message window
The “To” button allows the sender to select recipients and content is typed in the text box below. A file attachment icon provides for the uploading and sharing of documents. Clicking on the send button completes the entire process.

![Messages](image)

Figure 34. The message window showing one new, unread message.

To encourage appropriate electronic interactions, Donna reviewed online etiquette (netiquette) several times with her cohort and posted ongoing reminders. Despite all of these efforts, however, Donna wondered whether or not her students would still set up an off-site community using social media. Through conversations with her students, Donna discovered that while a group had indeed been formed on Facebook, people were beginning to communicate less on that platform and were using Pepper with growing frequency.

5.3.4 Individual reflection: time for personal contemplation

Finally, Donna believes that Pepper will support individual reflection and contemplation. At the beginning of each academic year a “get to know you” activity is assigned to all students. While this task is introduced in class, it is also posted on Pepper:
Students basically have to share a little bit about themselves and then comment on one or two other people. And by doing that, they start to know a bit about themselves. Some do it in video form [or] they might do it in other forms…but they [must] share them all in class as well as online in some way. (D.J., 2013)

Donna noted that individual class presentations are time consuming, leaving little or no opportunity for follow-up questions or reactions. However, once these presentations were uploaded to Pepper, students were able to sit down at their leisure to watch their colleagues. Donna was told that this gave them the chance to really get to know one another which made a:

…huge difference…I mean, people were in tears and they really started to understand each other and there was such a collaboration and camaraderie amongst them. I think…having that presence online made a huge difference to our dynamic. (D.J., 2013)

This particular example demonstrates how Pepper went beyond the classroom to serve as a powerful tool for deeper student reflection.

5.4 A Communications Coordinator’s perspective: Louise’s story

5.4.1 Background and role in the Master of Teaching program

Louise’s journey towards online learning and Pepper first began at university while she worked as a teaching assistant. After graduation, she secured a limited term lecturer position in teacher-education prior to her appointment as communications coordinator in the Master of Teaching (MT) program. This two-year course combines a Master of Teaching degree with elementary or secondary teacher certification. As coordinator, Louise’s primary role is to support ongoing communication between students and instructors. Louise also oversees a communications committee to ensure that all program-related issues are being addressed.
5.4.1.1 Introducing and integrating Pepper into the MT program

In 2010, the MT program began using the Blackboard learning management system. However, ongoing functionality and user access issues created so many challenges that Pepper was chosen to replace Blackboard after just one year of implementation. Although this sudden change caught many people by surprise, Louise is firm in her belief that the right decision was made at the time. Introducing Pepper meant that the MT department could anticipate greater design and functional flexibility as it was perceived to be an information communications tool and a course support mechanism.

Staff feedback regarding Pepper’s integration was largely positive and Louise attributed the smooth adjustment to Pepper’s user-friendly design that had been Roger’s top priority. She was also pleased with the ongoing support that Pepper provided to both instructors and students through various workshops. After attending a few of these sessions herself, Louise reported that few concerns were actually raised as basic navigational skills were mastered quickly. Going forward, she feels that the creation of several instructional videos would sufficiently replace the workshops while still providing assistance to those who are new to Pepper.

5.4.2 Louise’s experience of using Pepper in the MT program

As communications coordinator, Louise’s main goal is to ensure that regular, ongoing communication takes place between her instructors and students. To that end, she was asked to comment on her experience of using Pepper in her MT program. Although she has other learning management systems at her disposal and the authority to institute a change at any time, Pepper continues to be her department’s virtual environment of choice. Louise views it as a multi-function communication tool that provides different interaction methods for the purposes of developing community. Louise specifically named four features with which she had direct
experience. They include email notifications, open-access, shared conferences and built-in reports. Each one will be discussed more fully in the following sections.

5.4.2.1 Email notifications

Louise praised Pepper for establishing an immediate way for students and their instructors to remain virtually connected. Once candidates register their personal email addresses, they begin to receive immediate email messages whenever important information is posted. Louise is confident that all changes and updates that are made by instructors are received in a timely fashion, given that students rely on their smartphones for messages and check them regularly.

5.4.2.2 Open access for instructors

Louise is the first administrator to cite the open access feature, which is indicative of how courses and programs outside of the ITE program are customizing different Pepper applications. Open access allows instructors to freely access others’ courses and it distinguishes Pepper from other learning management systems:

If I’m the instructor of Course A and Jack is the Instructor of Course B and you know, Sarah is Course C…we never get to see each other’s courses. Whereas the way we have it set up in MT is that we can actually go into each other’s courses and see what kinds of things students are working on and how instructors have set up their courses and some of the key things that they are addressing in a way that is just not possible to do using other platforms like Blackboard... (L.T., 2013)

Accessibility to other courses on Pepper can help instructors in several ways. First, it can inspire them with respect to the ways in which their colleagues format their courses and display content, giving them a chance to also witness the implementation of new features. Open access also reduces the need for co-present meetings. Louise said that while instructors often talk about
collaborating, it is not always possible for them to actually meet. However, the 24/7 availability and accessibility of Pepper allows instructors to log on at a mutually convenient time of their choosing. When Louise’s instructors are able to find time to work together, they have been able to share their best practices and support one other’s pedagogical development. As a result, Louise reported that her instructors cooperated with one another through Pepper more than ever before.

5.4.2.3 Shared conferences

The ability to share folders between and among different cohorts was important to Louise and was addressed earlier by Roger and Donna in their interviews. She listed three benefits of using shared conferences in the MT program. First, Louise feels that first and second-year students should be allowed to socialize across cohorts in order to ask questions and share experiences and network. A second benefit applies to instructors who teach similar courses as they can access the same materials in order to maintain consistent course content and delivery. From an organizational perspective, shared conferences also reduce posting repetitive information in multiple environments.

![Conference folders on a cohort homepage.](image-url)
5.4.2.4 Custom reports

The fourth feature that Louise identified is Pepper’s Custom Reports, which were described earlier as a way to support student assessment. She reported that her instructors love the fact that they can examine the number-crunching aspects of these reports, which generate specific information about students’ online habits. Although this feature offers instructors a variety of relevant data for assessment and evaluation purposes, Louise feels that it should also address qualitative feedback. She wonders if some additional functionality can be introduced that would allow instructors to send immediate private comments to students about their online work and efforts.

5.4.3 Summary

The interview data that was collected from the interviews with Roger, Donna and Louise revealed the following about Pepper’s role in building online community in the ITE program:

a) The notion that we can strengthen an existing face-to-face community through the creation of an online environment and fostering an online group presence;

b) The notion that simply providing an online environment is not sufficient; it is also important that the online environment serve an authentic purpose (hence Donna’s use of Pepper as a shared repository, a place for discussion, and a place for reflection and personal contemplation)

c) The notion that the connections established in face-to-face community might continue to be sustained online, even after the program ends and students go their separate ways;

d) The notion that mobile devices have become an important part students’ lives; consequently, online environments that support community must have a mobile presence;

e) The notion that community can exist at several levels, namely, community within cohorts as well as community cohorts; and
f) The notion that private interaction is integral to developing a sense of online community. Ideally, supports are provided for private and public communication in one space (i.e., Pepper) rather than dividing it across multiple online tools (e.g., Pepper, Facebook, email, etc).

### 5.5 Option Coordinator perspectives of Pepper

This next section will describe the findings that were generated from a second set of interviews that were conducted with four Option Coordinators who will be referred to as Carla, Eleanor, Micki and Marissa. Please note that all names have been changed for the purposes of maintaining anonymity. A brief introduction to these participants along with a description of the experiences and positions that shaped their educational backgrounds are provided below.

#### 5.5.1 Carla

Carla was seconded from her elementary classroom to the ITE program in the fall of 2012. Her specialties are literacy and technology, having worked as technology lead at the school level and later on, as a school board computer resource teacher. Carla also held a position as an Education Officer overseeing an e-learning project for the Ministry of Education.

#### 5.5.2 Eleanor

As a retired elementary school principal, Eleanor worked at the school board level for eight years and has several years of experience facilitating the Principal’s Qualification Program at the university. For the latter part of her career, Eleanor has focused on teacher education, particularly as it relates to administrative positions. She is currently in her third year working as an Option Coordinator.
5.5.3 Marissa

Marissa was seconded to the ITE program three years ago and during that time she simultaneously completed a doctoral degree in education through a different university. When her secondment was not renewed, Marissa resigned her position at the school board and now works full time at the university as both a lecturer and an Option Coordinator.

5.5.4 Micki

Micki was seconded to the ITE program four years ago and has previously worked as a literacy consultant. She has been partnered with Eleanor from the beginning and together, they facilitate Cohort 3, the only off-site cohort group.

Unlike Roger, Donna and Louise, these four educators were employed by the university to directly oversee and manage up to 70 students in one of six different Option groups. Each Option also includes between seven and eight on-site instructors who are responsible for delivering ten subject-specific courses.

The ten questions that were posed to each Option Coordinator can be viewed in Appendix E. The overall purpose of these interviews was to find answers to the following three questions:

- In what ways does Pepper support instructors and students?
- What expectations regarding Pepper did the Option Coordinators have for their students?
- In what ways did the Option Coordinators incorporate Pepper across their cohort groups?

These questions will be separately examined in the following paragraphs.
5.5.5 In what ways does Pepper support instructors and students?

During their interviews, the Option Coordinators briefly discussed their roles and responsibilities as well as their technological knowledge of different virtual learning platforms. Despite their varied online experiences, not one of them had used Pepper prior to working in the ITE department. Consequently, the Option Coordinators were asked to describe the ways in which Pepper provided support to both them and their students.

An analysis of the interview data showed that all Option Coordinators felt that Pepper provided three different types of support. First, it offered technical support along with individual and small-group training to both instructors and students. It also encouraged emotional connections, socialization and professional development through the posting of messages to the Wall. Finally, the Option Coordinators felt that Pepper promoted inclusivity in a way that external social media websites like Facebook do not. Each one of these three forms of support will be explored here.

5.5.5.1 Technical support and training

The Option Coordinators were unanimous in their assertions that Pepper provided ongoing technical support as well as training for new users. Marissa appreciated that a dedicated online space called a course shell was immediately made available to her so that she could familiarize herself with Pepper’s design and functionality. This not only helped her to understand the available features, it also guided her in determining how she would introduce Pepper and ultimately use it with her students.

Pepper developer Roger was named as a source of ongoing support for the Option Coordinators, with Carla revealing that he:
…sat down with us and talked about how to use Pepper and what it can do for us as an option. And last year we implemented it. So all the elementary coordinators did it – all the cohorts and we haven’t turned back since. (C.J., September 20, 2013, personal interview)

Micki described her experience with him as being:

… really great. He’s been really efficient. Eleanor and I were constantly sending him questions on how to do different things, namely setting up our electronic calendar…private messaging…little things because I’m certainly not tech-savvy. So I’m learning how to do this and he helped us. So I did miss the original training but I did get some one-on-one training with him, which was great. (M.R., 2013)

For Carla, Roger was constantly accessible:

He sent me links online and said if I had questions I could email him at any time. There were even some ridiculously late emails at night flying. (C.J., 2013)

In addition to the individual and small-group support that was offered to the Option Coordinators, Pepper also provided training sessions for all students. As one of the coordinators of the only off-site Option, Micki worried that geographical distance might prevent her students from taking advantage of this unique opportunity:

It was a lot to ask of them to go down just for Pepper training, when a lot of them are tech-savvy themselves and could probably figure it out. But I really wanted them to hear the same messages and how we use and become comfortable all at the same time. So on registration day, two labs were organized and the support team came to work with my candidates and they all logged in that day. (M.R., 2013)

She reported that this session enabled her cohort to collectively:
…practise writing introductions to each other on Pepper and to see all of the different folders that we have to work with. I would say within a couple of days they were all extremely comfortable. (M.R., 2013)

Carla and Marissa described similar training arrangements, with Eleanor and Micki noting that they required two training sessions as a result of their large class size.

5.5.5.2 The Wall encourages social, emotional and academic connections

Collectively, the Option Coordinators felt that Pepper supported instructors and students by way of the real-time scrolling window function known as the Wall. In her interview, Marissa shared how her students used wall messages for organizing social gatherings after hours:

Students will say “Check out the social conference because we’re doing pub night tonight” or “We’re going to the Duke” or “you know, right now we are doing a charity for a First Nations community for Valentine’s Day”. (M.T., 2013)

Micki described an emotional connection that her entire cohort made when a student had to leave the course early on:

We had one student who had to drop out of a course. After first practicum he became very ill and has been in the hospital since. He just got on Pepper to say “hi” to everybody and there was a huge, you know, overjoyous moment on the Wall. Everyone went to the hospital to visit him…and we all chipped in to buy him lovely gifts. So it was nice because not everybody is on Facebook but the whole cohort and all the candidates are on Pepper. So that’s just an example of the community building as well as all the great sharing and knowledge building that goes on. (M.R., 2013)

Marissa explained that the social and emotional connections that were being formed on Pepper were not limited to students. She too, was a recipient when she:

…was featured on the radio a couple weeks back. So one of the students heard me and put the audio file online and everybody congratulates you on the Wall. So it’s a really nice medium for supportive encouragement, positivity, people are very friendly on the
Wall as well as in the lounge too. But the Wall’s right there, right? So it’s the most prominent. (M.T., 2013)

In addition to supporting cohort members both socially and emotionally, the Wall also allowed students to offer their services to one another. One of Eleanor’s students:

…ran a SMARTboard workshop after school so he was able to pop onto the wall and explain the time and what he was going to offer. And people then got back to him on the messages with “thanks a lot” and “I’ll be there”. That sort of thing. So they are able to get on and offer assistance and ideas. (E.S., 2013)

Carla also witnessed a student offering his talents to his cohort colleagues:

One of my candidates is a very strong young man, a leader, a true leader. He came on and said “I am the math person in our group” because I think we only have two math majors. And he said, “And I know that many of you are intimidated by Math. I’m willing to help anyone who is working on an assignment or would like to see what they can do or even help you learn a concept”. So he used Pepper to be able to let people know he was available for that type of help. (C.J., 2013)

5.5.6 Pepper is inclusive, unlike external social media sites,

Although all cohorts met weekly for face-to-face classes, it was still an ongoing challenge for the Option Coordinators to maintain a sense of inclusion in their virtual environments. This issue was particularly significant for Micki, Eleanor and Carla as all three are experienced Tribes trainers. Tribes learning communities emphasize safe and caring environments where no one is excluded or devalued. When it was discovered that Facebook pages were being created outside of Pepper for socialization purposes, none of the Option Coordinators were invited to join in. Carla only learned of her cohort’s Facebook site through a student’s offhand comment of, “We’ll post that on our Facebook site”:

And I’m thinking, “Your Facebook site?” And they said, “Yeah, yeah, you can go on and see it there!”. But no one has ever said, “Carla, you should be part of our site…here’s the
link, you can join us!” They’ve not done that. So I find that interesting first of all that they came up with that, making a site. And then they run with it! They do their thing and I’ve never tried to get in. (C.J., 2013)

Micki underscored the fact that Facebook does not necessarily promote feelings of inclusiveness among her students:

This year one teacher-candidate initiated setting up Facebook and she invited everybody. But I would say that maybe not even 75% of the teacher-candidates are actually on Facebook. (M.R., 2013)

When she heard about this, Micki did not immediately react. Instead, she chose to wait and see how her cohort would address the situation. Eventually, a compromise was reached with the decision that all future communication would be posted on Pepper as well as externally on Facebook. Although the Facebook community continued to exist, Micki reported that:

Eleanor and I were not invited to be part of it, which is fine. The students use Pepper for everything else. So if they’re having a social event, they will post it on Facebook but they will also post it on Pepper now so that it’s more inclusive and everybody can see it. (M.R., 2013)

Unlike Facebook and other social media sites, Pepper promoted an inclusive learning environment by granting all students full access to Wall postings and the Community area.

5.5.7 What expectations regarding Pepper did the Option Coordinators establish for their students?

It was not possible for the Option Coordinators to meet prior to the start of classes and collectively develop a set of user expectations. Individual interview data, however, revealed a shared vision as similar expectations were described. However, the ways in which these expectations were enforced over the year appeared to vary, which may help to contextualize the
Anova results that were seen in Chapter 4. In total, five expectations were revealed. First, the Option Coordinators expected students to establish a regular online routine. Next, they were asked to set up personal email alerts. The third requirement was that students were required to conduct their online communications exclusively on Pepper. The Option Coordinators also insisted that members post to appropriate conference folders. Finally, as future educators, the students were expected to maintain a professional online conduct. Each of these expectations will be discussed further in the following sections.

5.5.7.1 Establish a regular online routine

All of the Option Coordinators wanted their students to log into Pepper regularly in order to manage the new content that was constantly being posted and uploaded. They felt that developing a routine early on would help with organization and management skills. However, the Option Coordinators readily acknowledged that this was not always possible to achieve. Although Eleanor herself typically averaged one or two online visits per day, she admitted to having no actual set routine. Instead, she compensated for the occasional missed day by logging in multiple times on different days. Micki and Marissa reported that their habit was to log into Pepper daily while Carla checked two or three times so as not to miss any new postings.

Although all four Option Coordinators shared their personal log-in routines, Micki and Eleanor were the only two who specifically asked their students to check Pepper daily. This finding coincides with the log-in results from Chapter 4 which suggest that some Option Coordinators may have insisted on regular log-in routines more so than others.

5.5.7.2 Set up personal email alerts

In order to receive important messages in a timely fashion, the Option Coordinators insisted that their students set up personal email alerts by clicking on the Preferences >
Notifications option and entering their personal email address. Once this information was entered, Pepper forwarded all notifications immediately. Marissa shared that after her students were asked to set up their alerts, they received an important message from her:

Last Tuesday for Math, we had to change rooms. So I alerted everyone to come at 9:15 am and to check on Pepper beforehand to see what room would be available. And they all met me there. (M.T., October 3, 2013, personal interview).

In Carla’s cohort, despite the fact that she posted multiple reminders, several students failed to receive important messages. She admitted to having thoughts of:

“We need to get a hold of you…you need to be electronic!” Being the geek that I am, I mean, I’m on constantly and I have all my alerts set. So even if I don’t go online to check Pepper, my mail is set to any movement, any posting on Pepper. I immediately get an email alert. And I know to shoot over and look in Pepper and see what’s there. (C.J., 2013)

5.5.7.3 Communicate within Pepper

Despite the Facebook communities that were being set up outside of the ITE program, the Option Coordinators expected their students to use Pepper regularly for communication purposes. From the beginning of the year, Carla and her partner emphasized that all communications would be conducted exclusively through Pepper. She recalled telling her students:

First of all, we do everything on Pepper. Period. So don’t go thinking you’re going to go somewhere else. We made it clear that we would be using Pepper and they were instructed to set their alerts so that they knew that when announcements were made and to check it. (C.J., 2013)
Communicating on Pepper can take place via the Wall, private text messaging as well as in individual conference forums. Micki felt that private messaging supported greater student-instructor communication because:

They know that nobody else is seeing that message. So by the click of a button, they are either clicking “private” or “public” or listen to people that they would like to message and so when they’re clicking “private” with me, they know that it’s just going to be a private conversation. It’s conversation just with the instructor. And they feel comfortable doing that. (M.R., 2013)

5.5.7.4 Post to appropriate conference folders

Conference folders in Pepper were a way for Option Coordinators to categorize their course content. They are created by clicking on Administration > Management > Conferences and were typically named for subjects like Social Studies and Music. Folders were also created for Announcements, conference areas, support groups and cafes (lounges). Folder colour is significant, with green indicating open access and yellow giving permission for read-only access.

There is no limit to the number of folders that can be created within a cohort. Within her Pepper environment, Micki revealed that she and Eleanor created numerous folders for organizational purposes:

If you look at our site it looks busy because we’ve got probably 20 or something folders on the homepage. But it’s certainly really, really easy. And my intention was to make it really easy…(M.R., 2013)

While most of her students used the different folders appropriately, Eleanor admitted that there were still those who did not pay attention:
Occasionally, I have to explain to somebody who might have posted something in the wrong place. But it’s very rare, it’s pretty easy to use and we haven’t run into much in the way of students needing that kind of support. (E.S., October 1, 2013, personal interview)

Carla experienced a similar situation in her own cohort group:

…the weaker technology students were putting things in the wrong places. And I’d say, “Did you post?”. “Oh yeah, I put it here”. “Well, no, that’s not where it belongs so please repost to where it belongs”. (C.J., 2013)

5.5.7.5 Maintain professional online conduct

The final expectation that the Option Coordinators had for their students regarding Pepper was the maintenance of their online professionalism. Despite working with adults who were training to become qualified educators and ultimately, role models, Eleanor still had to issue reminders about appropriate online interactions:

Some of the casual or personal language that might be okay in another forum, you know, we had to remind them that that would not constitute professional behaviour on the part of a teacher in a forum like Pepper. (E.S., 2013)

Caral described some of her own personal experiences and stated that when people become too comfortable online, they tend to forget that everyone can view their actions. To illustrate her point, she shared an incident that took place in her cohort during one of her on-site classes. A visiting guest speaker projected a wiki (an editable website, to which all students had access) onto a screen and:

…she started to type a message on a virtual post-it note. And didn’t one of my clowns go in and remove it and change the wording of her note. Then everyone breaks out laughing and she turns to see what’s so hilarious and of course it’s because her note says something that you know, she didn’t write. Someone else is being silly. And then another one…somebody writes “Where’s Waldo?” and pops up a picture of Waldo. I wouldn’t have expected that from my own Grade 7 class. (C.J., 2013)
This situation left Carla feeling dismayed as it was clear that these students had little regard for how they wanted to be perceived as future educators.

5.5.8 In what ways did the Option Coordinators incorporate Pepper across their cohort groups?

The next section of interview questions focused on the ways in which the Option Coordinators used Pepper in their individual cohort groups. An analysis of the interview data indicated that the Wall, calendar, private text messaging and online repository were incorporated by all four Option Coordinators. In addition, Carla mentioned two other features that she had discovered incidentally. All six will be described further in the ensuing paragraphs.

5.5.8.1 The Wall

The Option Coordinators unanimously named the Wall as one of the first features that they chose to implement with their students. Marissa compared Pepper’s Wall to the one that is used on Facebook. Please note that in addition to the walls featured in individual cohorts, instructors have access to an instructor-only wall.

Figure 37. The Wall shows online status and current Wall postings.
Marissa described the wall as the place where she uploaded and shared numerous PowerPoint presentations and lesson plans with colleagues. For her, it is:

…a communication tool as well as a knowledge building tool too. We use Pepper a lot to help and support and mentor the new people as well as communicate information items so that when we do get together, we focus in on professional capacity building as opposed to just information items. (M.T., 2013)

Micki noted that many ITE instructors used the Wall to pose course-related questions and other queries to their colleagues. Eleanor appreciated how it helps her to remain informed of ongoing university events. Checking the Wall consistently also kept her in touch with colleagues.

5.5.8.2 The Pepper calendar

The second feature that was identified by the Option Coordinators was the Pepper calendar. Teaching partners Micki and Eleanor revealed that they used it regularly to keep students apprised of due dates, presentations and schedule changes regarding teacher practicum placements. Marissa pointed out that the new version of the calendar has reduced paper and photocopy costs, thereby supporting a personal environmental goal.

5.5.8.3 Pepper text messaging

All of the Option Coordinators regularly used Pepper text messaging and encouraged their students to make use of it as well. Messages can either be addressed to large groups (public messages) or limited to two or more people (private messages). Despite her personal preference for regular email, Carla admitted that she, too, occasionally used Pepper messaging to contact small groups of students and specific individuals.
The Option Coordinators noted that their students were also using the feature to send them personal or urgent messages. Over the span of their course, Micki said that she and Eleanor received:

…hundreds and hundreds of private messages. So the teacher-candidates don’t email me, they private message me on Pepper every single time. (M.R., 2013)

5.5.8.4 Online repository

The fourth Pepper feature that all of the Option Coordinators chose to incorporate is the online repository. Each Option group had two separate repositories, one for instructors and one for student use. These areas permitted the uploading, downloading, storage and retrieval of relevant course materials and resources. Marissa said that she used her repository to upload various lesson plans, slideshow presentations and articles. Carla and Eleanor reported that once a class ended, all of the presentation resources that were used or referenced were immediately uploaded to the repository so that their students could select the materials that they needed. Eleanor explained that students would:

…go in and get the PowerPoint and handouts electronically. For some it’s been very useful because I haven’t had to do paper handouts. For some materials I can simply post and then they can access it or if they want to print it themselves, they could. (E.S., 2013)

In addition to its storage capabilities, Carla revealed that she used her repository as a way to support a flipped classroom environment. This is a form of blended learning whereby students are introduced to new content prior to class by viewing videos or listening to audio files on their own time. In-class sessions are then spent collaborating with colleagues on follow-up assignments and activities based on the new content. This teaching method encourages greater interactions among students while giving instructors more time to offer personalized guidance.
(Wikipedia, 2014). The flipped classroom is a contrast to traditional one-sided lecturing since Carla could:

...provide the information up front [so that] students are prepared for class. They’ve done the homework before the class and they come into class for the consolidation. (C.J., 2013)

Occasionally, she recorded audio to accompany her PowerPoint slides as she knew that her students would:

...get more information from an audio lens which should appeal to a different learner, an auditory learner as opposed to the learner that just sits and reads. And by providing the information up front If they’re prepared for class, when they get into class, they can work in small groups toward achieving something that they’ve received information about. (C.J., 2013)

Carla reported that her students embraced this new learning method because it empowered them to prepare for class ahead of time. The repository also supported student collaboration and reflection when supplementary activities were uploaded on the day of class:

I’ll tell them that, “I’ve posted links for you to be able to get to. You’ll need some sort of technology in class and you need to bring it with you. Get into groups with at least one or two computers in your group. And then you’ll have the documents that you need…” (C.J., 2013)

5.5.8.5 Search for notes and keyword features

In addition to the four features that were mentioned above by all Option Coordinators, Carla cited two additional, lesser-used features that she found to be useful. She credited the Pepper team for introducing her to the search for notes feature, which can be found under the Windows tab and was discussed earlier in Chapter 3. Carla explained that selecting a student’s name from the drop-down class menu lists all of their postings to date. A second drop-down
menu provides for a folder-specific search. A third option is a keyword search which is particularly useful for assessing student content. Instructors can list specific words or phrases in order to generate a list of notes containing that specific content.

Carla described a time when she needed to locate a student’s work but was having difficulty navigating through all of the postings. She was surprised to learn that on Pepper, everything that her students had posted was:

…actually all there. It’s a search for notes. So I can actually search for notes with words and I can [also] search by anyone’s name, which is what I’m doing now. I’m able to click on their name and bring up everything that they’ve done. So now if somebody says to me, “Well, I posted that”, well, ok, but I can’t find it! But now I can go in and search through and that has made things a little bit easier for me. (C.J., 2013)

Carla was pleased to discover that what she initially viewed to be a challenge resulted in her introduction to two other organizational tools.

5.5.9 Summary

These interviews provided insight into the ways in which the four Option Coordinators perceived, developed expectations for and incorporated Pepper into their cohort groups. The data revealed the following findings:

a) The notion that Pepper provides instructors and students with ongoing technical, emotional and social support through training sessions and features (the Wall).

b) The notion that Pepper fosters feelings of inclusion as all students have access to the features that encourage communication and interaction (the Wall, private messaging, Announcements).
c) The notion that despite the lack of a set of collective expectations that could be consistently enforced across all cohorts, the Option Coordinators had similar guidelines for their students’ use of Pepper. Students were expected to develop an online routine, set up alerts, communicate on Pepper, post to appropriate folders and maintain professionalism.

d) The notion that the Option Coordinators incorporated several Pepper features into their online environments (the Wall, calendar, private text messaging, online repository). Other lesser-used features were also mentioned (search for notes, keywords)
6 Chapter 6

6.1 Question #3: How do students perceive and use Pepper as an extension of their classroom environment?

In the previous chapter, three administrators and four Option Coordinators were interviewed about their perceptions of Pepper and the ways in which certain features were introduced to encourage the development of online community. However, in order to present a full picture, it was felt that the impressions and reactions of another group must also be included. Consequently, this chapter will serve to introduce the reader to an exit survey that was developed and administered specifically to the ITE students in the spring of 2013.

6.2 Development of the Pepper survey

A member of the Pepper research team named Lisa was responsible for having suggested the idea for an online student survey. As a doctoral student who had attended numerous meetings with both Option Coordinators and instructors, Lisa was familiar with their experiences, questions and suggestions. Her interactions with the ITE students, however, were limited, which in turn piqued her curiosity about the ways in which they chose to incorporate Pepper into their learning.

The survey itself was four questions long and a copy of it can be viewed in Appendix E. It featured two multiple-choice and two open-response questions, with each one focusing on a different aspect of Pepper. More than 400 students from all six ITE cohorts were invited to participate via email messages and reminders which were posted to both the Announcements and Wall areas. The survey was hosted on a university-supported online tool called Survey Wizard and went live once classes had ended and students were completing their final practicum.
placements. It remained active for a two-week period before it was closed for the aggregation and interpretation of data.

Of the 420 active ITE students in the 2012-13 academic year, 73 respondents participated overall (n=73) for a response rate of 17%. Once the survey ended, Lisa prepared a one-page feedback form to showcase her findings, all of which can be viewed in Appendix F. Shortly thereafter, these results were presented to the Pepper team as a way of giving voice to the students’ suggestions and comments. The form was also intended to help guide and inform the team about future changes. Lisa’s results, however, did not address the individual data that was generated by each question. This prompted the researcher to prepare a separate analysis for the purposes of this investigation. The data that were generated by each question along with an explanation for each are presented for consideration herein. It is hoped that this survey will continue to be administered each year so that comparisons can be made with future ITE cohort groups.

Lisa selected four specific areas of focus for her survey based on what she wanted to discover about Pepper from a student perspective:

a) Pepper’s perceived level of effectiveness
b) Pepper’s support of community development
c) Pepper’s support of individual learning
d) suggestions for improvement

6.2.1 Pepper’s perceived level of effectiveness

The first multiple-choice question asked candidates, “How effective was Pepper in supporting the community in your cohort?” It was structured using a Likert scale, which is a five-point visual rating system. Participants were invited to choose a response that was assigned
a number between 1 and 5 and ranked on a horizontal scale. Each number represented a different level of effectiveness:

- 1 represented “not at all effective”,
- 2 showed “slightly effective”
- 3 represented “somewhat effective”
- 4 was “very effective”
- 5 showed “extremely effective”

Table 7

*Question 1 from student exit survey*

<table>
<thead>
<tr>
<th>How effective was Pepper in supporting the community in your cohort?</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 73)</td>
<td>----</td>
</tr>
<tr>
<td>a) not at all effective</td>
<td>0%</td>
</tr>
<tr>
<td>b) slightly effective</td>
<td>3</td>
</tr>
<tr>
<td>c) somewhat effective</td>
<td>12</td>
</tr>
<tr>
<td>d) very effective</td>
<td>34</td>
</tr>
<tr>
<td>e) extremely effective</td>
<td>24</td>
</tr>
</tbody>
</table>

Of the 73 respondents who participated, nearly 80% of them felt that Pepper was either extremely effective or very effective. These results suggest that the features that were introduced to encourage community development (Wall, private messaging, Announcements) were being used on a regular basis. Whether these students were motivated to do so as a result of earlier training sessions, reminders from their Option Coordinators or another reason is unclear. 4%
found Pepper to be only slightly effective for reasons that are unknown to the researcher. This result may suggest that students perceived a lack of support and/or guidance from their Option Coordinators.

6.2.2 Pepper’s support of community development

Question two in the survey was structured as open-response so as to elicit individual and possibly multiple thoughts from students. Participants were asked, “In what ways was [Pepper] used to support the class community in your cohort?” An analysis of the data revealed the emergence of 4 categories as each one generated multiple responses (i.e., more than 15). Ideas that only generated between 1 - 2 responses were categorized as “Other” in Table 8 below. Please note that unlike Question 1 where n=73, the n value dropped to 66 as 8 participants chose not to respond for reasons unknown to the researcher.

Table 8

Question 2 from student exit survey

<p>| Question 2 – |</p>
<table>
<thead>
<tr>
<th>In what ways was Pepper used to support your cohort community?</th>
<th>(n=66)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) To communicate with privately with peers, Option Coordinators</td>
<td>47</td>
<td>71%</td>
</tr>
<tr>
<td>b) Regular posting of course information, etc. to calendar, forums</td>
<td>60</td>
<td>91%</td>
</tr>
<tr>
<td>c) social interactions on the Wall</td>
<td>23</td>
<td>35%</td>
</tr>
<tr>
<td>d) To submit/upload assignments, resources, notes</td>
<td>18</td>
<td>27%</td>
</tr>
</tbody>
</table>
91%, of students felt that Pepper supported their communities through the regular posting of course information, updates, reminders and announcements. 71% felt that it was a communication tool through which they could interact with their peers and instructors. 35% cited the social communications on the Wall, which were referenced earlier in Chapter 5 by the Option Coordinators.

Overall, these answers suggest two things. First, Pepper supported feelings of community among students primarily through the posting of information to the calendar and different conference folders. Having regular access to shared information helped students to bond with one another, especially over cooperative assignments. Secondly, students appreciated the way that Pepper encouraged social interactions via the Wall as well as through private student-student and student-instructor communications.

6.2.3 Pepper’s support of individual learning

The third survey question was developed using a multiple-choice format. Lisa generated thirteen different responses for students’ consideration, which can be seen in Table 9 below. Please note that for this question, the term instructors specifically refers to the people teaching individual classes and do not include the Option Coordinators themselves. Like Question 2 above, multiple responses were encouraged. Students were asked, “In what ways did Pepper support your learning?”.
Table 9

*Question 3 from student exit survey*

In what ways did Pepper support your learning?

<table>
<thead>
<tr>
<th>Choices</th>
<th>(n=73)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) communication channel to Option Coordinator for questions</td>
<td>60</td>
<td>82%</td>
</tr>
<tr>
<td>b) communication channel to instructors for questions</td>
<td>58</td>
<td>79%</td>
</tr>
<tr>
<td>c) submission of assignments</td>
<td>67</td>
<td>92%</td>
</tr>
<tr>
<td>d) access to lesson plans, teaching tools, etc.</td>
<td>66</td>
<td>90%</td>
</tr>
<tr>
<td>e) text messaging other students</td>
<td>68</td>
<td>93%</td>
</tr>
<tr>
<td>f) discussion with other students</td>
<td>62</td>
<td>85%</td>
</tr>
<tr>
<td>g) collaborating with other students</td>
<td>61</td>
<td>84%</td>
</tr>
<tr>
<td>h) social connections</td>
<td>51</td>
<td>70%</td>
</tr>
<tr>
<td>i) scheduling (calendar)</td>
<td>42</td>
<td>58%</td>
</tr>
<tr>
<td>j) access to feedback from class instructors</td>
<td>58</td>
<td>79%</td>
</tr>
<tr>
<td>k) access to feedback from Option Coordinators</td>
<td>54</td>
<td>74%</td>
</tr>
<tr>
<td>l) access to feedback from peers</td>
<td>43</td>
<td>59%</td>
</tr>
<tr>
<td>m) other (please specify)</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>
93%, of students viewed Pepper’s private messaging feature (e) as the most popular way to support their learning. Pepper was also a place where 92% of students could upload their assignments (c), 90% could access information (d), and 85% could engage in online discussions with their colleagues (f). Choices a) and g) which describe Pepper as a way to communicate with Option Coordinators (82%) and collaborate (84%) rounded out the responses that garnered the highest results. While choice a) is clear in its reference to text messaging, choices d), f) and g) are vague as they do not directly reference a specific Pepper feature. Consequently, the researcher can only suggest that cohort repositories may have been used for choice (d), threaded discussions for choice (f) and text messaging for choice (g).

At 58%, the lowest percentage related to the use of the Pepper calendar. Interestingly, this result coincided with issues that Donna herself had experienced and described earlier in Chapter 5. This response suggests that unlike Donna, who championed the new calendar format to help with student organization, other Option Coordinators did not use it on a regular basis.

6.2.4 Suggestions for improving Pepper

The final survey question was structured as open-response and asked students, “In what ways could Pepper be improved to facilitate your learning?”. Once again, multiple responses were encouraged and Table 10 shows the five categories that emerged once the responses were grouped for common themes. For this particular question, $n = 68$ as 5 students did not answer for reasons unknown to the researcher.
Table 10

Question 4 from student exit survey

Question 4:
In what ways could Pepper be improved to facilitate your learning?

<table>
<thead>
<tr>
<th>Option</th>
<th>(n=68)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) improved functionality</td>
<td>25</td>
<td>37</td>
</tr>
<tr>
<td>b) improved design/formatting</td>
<td>22</td>
<td>33</td>
</tr>
<tr>
<td>c) other</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>d) improved communication methods (messaging, notes, email)</td>
<td>16</td>
<td>24</td>
</tr>
</tbody>
</table>

Collectively, 70% of students felt that changes to Pepper’s functionality and design were required. In terms of formatting and design, the respondents made several suggestions, including:

- an easier and simpler interface
- an improved area for collaboration
- a wider chat window
- a new way to mark posts as favourites
- placing recent messages at the top of conference lists
- moving features to the left side and creating one dedicated area for the posting of assignment-related information.
Suggestions for improving functionality included:

- a “read all” button to mark unread items
- a mobile version of Pepper
- the ability to post videos instead of youtube links
- the ability to communicate with other cohort groups
- group videoconferencing
- an automatic archiving system as things got a bit messy towards the end of the year
- a unique search engine within Pepper to locate a specific post or file
- a news section to post upcoming events

6.2.5 Summary

The results from the first online student exit survey suggest that like the Pepper administrators and Option Coordinators, ITE students were also invested in Pepper’s support of their learning and community development. The data collected from the survey questions revealed the following:

a) Overall, students felt that Pepper was very effective in supporting community development in their respective cohort groups.

b) Respondents felt that Pepper supported their class communities in two distinct ways. First, it enabled students to communicate with peers and Option Coordinators privately as well as in small and large groups. Pepper also
provided a way to share and deliver information (course updates, social events, etc.) efficiently.

**c)** Private text messaging was used by a large number of students to support their learning. Pepper also helped students to submit their assignments and access relevant teaching materials and resources.

**d)** Students made several recommendations for improvements and changes to Pepper’s design (simpler interface, larger chat window, etc.) and functionality (mobile version, cross-cohort communication, etc.).
7 Chapter 7

7.1 Research questions revisited

Here, the implications of my research findings along with several recommendations as to how Pepper can build community in a preservice teacher education program will be addressed. This final chapter has been divided into four parts. First, the three research questions that were presented in Chapter 1 will be revisited and detailed answers will be provided for each one. The second section will present five different findings that were made based on these responses. Part three will then outline six recommendations regarding future applications of Pepper in cohort-based programs. The final recommendation introduces the construct of participatory presence, which will be defined and explained in terms of its relevance and measurability for improved interactions and engagement in virtual environments.

7.1.1 Question #1: How do the different ITE cohort groups use Pepper in terms of its functions and features?

Five separate analyses were conducted to assess the degree to which i) the ITE groups used Pepper and ii) the degree to which the cohorts used Pepper’s core functionality. It was found that students in all cohorts logged in frequently. In fact, the average number of student log-ins exceeded the number of days in the academic year, suggesting that Pepper was both a familiar and well-visited environment across all cohorts. The number of public notes that were written each week was relatively low (0.65 to 2 notes per week) suggesting that students were not using Pepper for public discussions. The total number of private messages ranged from 2.33 to 5.67 messages per week, suggesting that much of the interaction on Pepper took place privately, whether it was student-to-student or student-to-instructor. Student interaction in public conference forums, as measured by the counts of replies, was surprisingly low.
Anova tests revealed that students in different cohorts behaved differently. There appeared to be different expectations and practices across the cohorts regarding time online, log-in frequency, note writing and so forth. Taken collectively, it appears that the cohorts mainly used Pepper as a repository for classroom readings, assignments and artifacts. They also used it for public announcements and private messaging, with a few cohorts using it for calendaring purposes. However, it wasn’t much used for public, threaded discussions. Given this context, Pepper might be best understood as an electronic tool for augmenting an active face-to-face community where much of the interaction takes place face-to-face, rather than a separate online community in its own right.

7.1.2 Question #2: According to the administrators and Option Coordinators, what factors contribute to the development of online community?

In Chapter 5, two separate sets of interviews took place. The first three were conducted with Pepper administrators Roger, Donna and Louise while another four took place with Option Coordinators Carla, Micki, Eleanor and Marissa. From these interviews, it was discovered that Pepper’s developer introduced several design features in the form of the Lounge, Community area and Wall in order to promote greater interaction among students and instructors. In addition to these design elements, the Option Coordinators felt that the inclusion of the seven features known as the Title, Welcome Image, Banner, Menu Item #1, Menu Item #2, Community and Registration encouraged the development of personalized spaces. It was their collective belief that customizing their Pepper environments contributed to the development of community within their respective cohort groups.
Another factor that the Option Coordinators identified is the support (technical, emotional and inclusive) that Pepper offers to all users. Once all of the technical questions and issues were resolved through training sessions, the Option Coordinators individually set five expectations in order to encourage the development of the emotional and inclusive aspects. Cohort members were required to establish a regular online routine, set email alerts, communicate exclusively using Pepper, post to appropriate folders and maintain a professional online decorum.

With respect to the features that Pepper offers to its users, both the administrators and Option Coordinators cited private text messaging, shared repositories, the calendar and Pepper’s built-in reports for tracking individual student progress. Creating profiles and email notifications were also listed as necessary features if students and instructors intended to establish their online presence and remain informed of the goings-on in their respective cohort groups. Finally, the Wall was noted as an important feature that supported not only socialization but individual reflection and contemplation.

In their interviews, the Option Coordinators also mentioned two additional factors that are unique to Pepper and which were perceived as contributing to the development of community. The first relates to shared folders, which are folders that are visible to instructors and students across all cohorts. This kind of accessibility helps to reduce feelings of isolation while simultaneously presenting cohorts as collaborative groups as opposed to silos working independently of one another. This special Pepper feature introduces students and instructors to the idea of smoothly navigating between several different levels of community. While one can easily collaborate with members in their own cohort community, shared folders also allow students to engage with members of other cohort groups that exist within a larger ITE community.
The second distinguishing Pepper feature relates to its shared space for courses. In most learning management systems, academic courses are given their own space and instructors can only view the content that they upload to their respective environments. On Pepper, however, instructors are able to see what is taking place in other classes. This type of openness and accessibility across classes encourages collaboration as well as the coordination of lessons and assignments with other instructors. The Option Coordinators said that they regularly checked in to different class environments in order to stay in touch with colleagues and remain apprised of new assignments and resources. Pepper’s unique shared course environment also provides more opportunities for shared assignments, team-teaching and group assessment, which is particularly useful in cases where instructors share similar students.

7.1.3 Question #3: How do students perceive and use Pepper as an extension of their classes?

In Chapter 6, the first, four-question Pepper student exit survey was described. Its purpose was to explore the ways in which the ITE students perceived Pepper and chose to incorporate it into their learning. 73 of 420 students participated, for a response rate of 17%. Question 1 focused on Pepper’s level of effectiveness, with nearly 80% of respondents rating it as either very effective or extremely effective. This suggests a high level of student approval for the system, either through training sessions or instructor reminders and/or support.

Question 2 asked students to describe the way(s) that Pepper was used to support class community. Data that was generated from this open-ended question resulted in the emergence of four categories. 91% reported that Pepper was used to post course information either by way of the calendar, Wall or conference folders. 71% described Pepper as a way to conduct private communication while 35% viewed it as a way to conduct social interactions. Only 27% felt that Pepper was a way to submit and upload their assignments and resources for public viewing.
Question 3 became more specific in nature as it sought to discover the ways in which Pepper supported students’ individual learning. 15 multiple choice responses were provided and 93% of students cited private text messaging as the most popular tool. This suggests that students felt comfortable communicating and sharing ideas with one another in smaller groups of 3 or more people. 92% reported that Pepper facilitated the submission of their assignments while 90% said that it helped in their access of information. 85% felt that Pepper supported them by allowing them to engage in online discussions with their colleagues. The lowest response of 58% was attributed to the calendar feature, which shows that it may not have been consistently embraced and implemented by all Option Coordinators.

The final question asked for suggestions in order to improve Pepper’s facilitation of student learning. 70% of respondents requested that changes be made to Pepper’s design (interface, chat window and positioning of messages and folders) and functionality (mobile version, videoconferencing, archiving system, unique search engine). 24% felt that upgrades to Pepper’s methods of communication (test messaging, notes, email) were in order.

7.2 Findings and implications

Based on the results that were generated from the three research questions, six different findings were made which are now presented here for consideration.

7.2.1 Finding #1:

The primary finding of this investigation appears to be that Pepper was not a place where students held shared, community-wide discussions about class-related issues. Instead, it was used more for the posting of announcements, sharing of resources, and the conducting of private communications. This in turn raises broader questions regarding the best uses for online environments. In cases where community members meet, face-to-face, on a daily basis, is it
necessary for online environments to have a strong discursive component? One might suggest that different types of online environments could be used to meet the needs of different types of communities. For communities where members meet and interact daily, the associated online environment might work best as an information distribution medium as well an archive of valuable shared artifacts. There would be less of a need for online discourse functionality, since the majority of discussions would be taking place face-to-face on a daily basis. However, in the case where community members are geographically or temporally separated, there would be a greater need for online discourse supports. Consequently, there may not be one simple answer when it comes to considering how online environments are used to support and enhance community building. Instead, it may be worthwhile to consider tailoring individual online environments in order to meet the specific needs of a community.

7.2.2 Finding #2:

The second finding focuses on how Donna and the Option Coordinators used Pepper to create a more open model for online support than was previously documented in the research literature. Courses in Blackboard, MOODLE and other learning management systems exist separately in their own silos. In the current research, however, all of the courses taken by a cohort of students were located in a single shared environment. This arrangement offered several advantages.

First, it allowed students and instructors to quickly and easily access materials without having to leave one virtual space and enter another. Secondly, it encouraged a sense of community through the existence of a single online space whereby all courses and course materials could be located. Students could log-in to this space and immediately see who else was online with them. They could meet in this space and interact with each other. Thirdly, it allowed
students and instructors to create links between resources between courses. This process is difficult if not impossible when using other traditional course management systems. Finally, it provided an easy way for instructors to observe their colleagues’ course outlines, assignments, due dates and uploaded materials. This allowed them to coordinate their activities while ensuring consistency and continuity across the entire ITE program.

7.2.3 Finding #3

The Option Coordinators recognized that different levels of community exist and they used Pepper’s features accordingly. Typically, the academic literature conceptualizes an online community as a single group of people who meet in a shared space where they can access course materials and interact with one another. In real life, however, communities are not so starkly delineated as different communities often have overlapping membership. Communities also exist at different levels, with some small communities existing within larger communities. The Option Coordinators’ use of the shared folders feature shows evidence of some of the complexities of real-life communities. When a student logs into her Pepper environment, she can access cohort-specific resources as well as shared folders that are being used by students in other cohorts. For example, a student might choose a Math Help folder and find himself in a space where students across all cohort groups are discussing challenges that they are encountering with math. In this sense, the Math Help community cuts across all individual cohort groups, breaking down the normal silo model of online community in favour of a more sophisticated and flexible model.

7.2.4 Finding #4

The data that was taken from the analysis of private messages suggests that private communication may play an important role in a community. Much of the research into online communities has focused on shared, public knowledge. However, there has been little or no
examination of private interactions in communities. The findings from Chapter 4 revealed that the private interactions that took place between students as well as between students and their instructors were more frequent than public interactions. It is hypothesized that students are more likely to ask for help, admit uncertainty or suggest an unusual idea when corresponding privately with others. Conversing in a public space is viewed as risky, since each public note is viewable by all students and instructors in the cohort. To engender trust between community members (which is a necessary condition for community development), it is proposed that there must be support for private communication. Thus, when online community is studied, it is imperative to develop a better understanding of the roles that are played by both public and private communications.

7.2.5 Finding #5

The student exit survey revealed a high level of concern regarding the relative lack of mobile supports. This finding is not entirely surprising, given that nearly everyone today carries a mobile device. However, it is proposed that the need for mobile supports may be particularly valuable in cases such as the one described by this study where technology is used to augment an existing face-to-face community. In communities where students regularly meet each other in person, they can use face-to-face communication in order to handle their daily interactions. When not co-present with their classmates (e.g., when travelling to class, travelling between classes, travelling home or on practicum) students use Pepper in order to communicate. This highlights the importance of being able to access online supports through mobile devices.

7.3 Recommendations

Based on the results and findings from the three research questions, a list of six recommendations is presented for consideration. They relate to the areas of instructor training,
student training, full open access courses, additional web 2.0 tools, graphic representations and finally, the introduction of a concept called participatory presence.

7.3.1 Improved instructor training opportunities

Although the Option Coordinators had no previous Pepper experience prior to working in the ITE program, they reported no difficulties while working in this online environment. Pepper’s user-friendly format and the inclusion of familiar social media tools such as the Wall, Like button and notifications all supported a smooth transition. However, the Anova tests that were conducted in Chapter 4 suggest some inconsistencies in usage patterns and indicate that different cohorts were using Pepper in different ways. Consequently, a series of instructor training videos that extend beyond a basic overview of functions and features to address specific issues and uses is recommended. For example, if the TPACK and SAMR models are used to help instructors integrate technology efficiently and effectively into their cohorts, more student-centered learning may result (Koehler & Mishra, 2009). This will become obvious in future connection diagrams and pie chart data.

It is also suggested that future instructor training address the issues of modeling, online presence and professionalism. First, there is a need for instructors to model effective technological use by way of the TPACK model so that they can support students who are new to online learning environments. This builds upon the findings of Foulger & Slykhuis’ (2013) study from Chapter 2 where 83% of preservice teachers reported that their use of technology was limited, due to their lack of pedagogical experience. The demonstration of appropriate online behaviours, responses and skills is necessary if students are to understand and integrate the TPACK method into their teaching.
Secondly, instructors must understand the importance of developing and maintaining their online presence if their goal is to oversee and encourage a thriving community of learners. In Chapter 5, Roger discussed the creation of Pepper profiles by way of a brief biography and selection of an avatar. Online presence can also be maintained through the regular use of private text messaging as mentioned by both Donna and Micki in their interviews.

Finally, instructors should be prepared to regularly remind their cohort groups about professional online interactions. To achieve this, it is first recommended that the Option Coordinators take time to meet and collectively develop a series of online expectations for all ITE students. This could be followed up by the creation of several support videos, which could be prepared either by Roger, the Option Coordinators themselves or several student volunteers. Each video could focus on a different issue such as appropriate language or respect for colleagues, both of which were raised by Eleanor and Carla respectively in their Chapter 5 interviews. Once completed, the videos could be uploaded to Pepper’s Community Resources area for quick reference.

### 7.3.2 Improved student training opportunities

As future members of the teaching profession, it is recommended that students receive training that addresses effective online behaviours. This is key if students want to avoid misunderstandings and conflict as described by Carla in her Chapter 5 interview. Students could be introduced to the three indicators that were referenced in Chapter 2 by way of Swan’s (2002) study. They include affective indicators (paralanguage/informal text), interactive indicators (acknowledgement) and cohesive indicators (greetings and nicknames). Developing an awareness of these indicators will help students to meaningfully contribute not only to the development of their respective ITE communities but later on, as education professionals.
As mentioned earlier, the creation of support videos would help to raise awareness among students by addressing the inconsistencies that were suggested by the Anova tests in Chapter 4. Small group training sessions held at the beginning of the year could also emphasize appropriate online behaviours and usage patterns. But the creation of a personalized environment through unique backgrounds, welcome images, wallpapers and banners as mentioned by Roger in Chapter 5 is an important first step. Roger’s primary concern was for students to feel a sense of belonging through membership in a new virtual home, or cohort group. If the Option Coordinators take time to design an online environment that is perceived to be both intimate and shared, the likelihood increases that their students will begin to incorporate these indicators into their interactions.

7.3.3 Full open access for instructors and students

In Chapter 5, Donna revealed that Pepper’s shared folders were used in her cohort for remedial math support as well as for the discussion of educational technology. Shortly afterwards, when these folders were opened to other cohort groups, Donna was able to witness firsthand the cross-mixing of students. Shared folders are a promising innovation which are helping to discourage the perception of cohorts as silos as previously mentioned in Section 7.1.2. Donna’s revelations have prompted a recommendation for full open-access in Pepper. This means that all classes, students and instructors within the entire ITE program at large will be able to view everyone’s work at any given time. While this will certainly encourage greater interaction and collaboration, the reality is that some students may not want to have their work and thoughts viewed by people in other courses. The issue of privacy is an important one that will have to be addressed and resolved.
In Chapter 4, an analysis of the overall number of public notes that were sent by students (Table 4) ranged from just 0.5 to 1.3 notes per week. In addition, the number of replies that were received by students (Table 6) ranged from .27 replies per week to .91. Both results indicate that little public interaction was taking place in the individual cohorts. However, granting students full open-access to all cohort groups as well as to other academic programs in ITE could lead to the generation of more notes and ultimately, more replies. Students may be inclined to pose questions, share information and reveal new insights and observations as a result of this new accessibility.

This in turn may help to strengthen students’ social connections, which Oren, Mioduser et al (2002) demonstrated in their study that was cited earlier in Chapter 2. Their exploration of interaction patterns in a MUD revealed that the proportion of student talk and the ratio of initiated student-student interactions and student responses were higher than in individual classes.

7.3.4 Additional web 2.0 tools

Pepper already incorporates several web 2.0 tools including the calendar, image/video sharing, collaborative authoring, private text messaging and file sharing. However, it is felt that the inclusion of three additional tools would further encourage social presence development and the emergence of online community. These extra features would also serve to address the concerns raised by Jude, Kajura & Birevu (2014) in their SAMR study about students’ lack of ICT knowledge.

The first recommended tool is a newsfeed, which would help students remain connected with university events, job postings, course information and other important announcements. In Chapter 5, Donna expressed her desire for ITE alumni to maintain their access to Pepper as the
system doesn’t cut off once a course ends. A newsfeed feature is one way to draw students back on a semi-regular basis.

The second suggestion is to include a blog feature similar to what other learning management systems offer. Blogging supports Puentedura’s (2010) third level in Phase 2 of the SAMR model known as modification. Blogging can also encourage more personal reflections and insights, which can then lead to the co-creation of new knowledge. In Chapter 5, Donna felt that Pepper’s format supports personal contemplation through the uploading of student-designed presentations. With the inclusion of a blog, text is included in a way that encourages personal, stream of consciousness writing to help students as they make meaning of what they are reading and watching.

The third recommendation is for social bookmarking, or what is more widely known as tagging. Given the number of postings that are generated to individual Pepper conferences over the course of a year, tagging would help to quickly categorize and identify student work. It may also contribute to an increased number of public notes that are published by students. Table 4 revealed that overall, students were only averaging approximately one note per week. Tagging would be particularly useful for sorting and classifying resources in online repositories as well as in the Announcements folders. However, the successful implementation of each of these three tools depends on whether or not they can actually be incorporated into Pepper’s current course design.

7.3.5 Graphic representations

Regular use of Pepper’s connection diagrams is recommended as they can provide instructors with two different types of information. First, the interaction of red circles (instructors) and blue circles (students) displays the levels of cohort engagement and
communication that are currently taking place. These visual representations may prompt Option Coordinators to take advantage of the custom reports feature that Louise described in her interview in Chapter 5. Custom reports offer ten different forms of student data ranging from time online to notes written. The acquisition this type of student-specific information can help instructors to collectively determine if changes to program delivery and/or pedagogy are required.

The second type of information that connection diagrams provide relates to the impact of cohort subgroups upon student-student interactions. As seen in Figure 18 in Chapter 4, some cohorts demonstrated high levels of student-student interactions. Other cohorts, in comparison, were more teacher-directed in nature. It is recommended that the Option Coordinators routinely generate and consult these connection diagrams (i.e., on a weekly basis), particularly if they are incorporating different pedagogical approaches such as SAMR and TPACK. These diagrams can provide immediate visual data regarding the quantity and frequency of communication that is taking place among instructors and students.

### 7.3.6 Participatory presence

The final recommendation introduces a concept that I developed as a direct result of the research findings. The construct of participatory presence was born out of the realization that while students and instructors may use several Pepper tools (avatars, private messaging, the Wall, calendar, Announcements) and strategies (online profiles, regular log-ins, email alerts) to facilitate their online engagement and interactions, there is still a need for improved, active engagement. If Pepper is to continue to enhance community-building in meaningful ways, students and instructors alike need to develop their awareness of several specific components in order to heighten their online profiles and interaction levels.
By definition, participatory presence is a phenomenon where the quality and nature of one’s online interactions can enhance the dynamic of a learning community. It is a concept that involves the identification and presence of five distinct factors. While the inclusion of additional elements is entirely possible, it is felt that the combination of the following five factors are essential. In no particular order, they are visual media, netiquette, frequency, higher-order thinking skills (HOTS) and personal experiences. Each one will be explained more fully in the upcoming section.

Table 11

*The five factors of participatory presence*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Online manifestation</th>
<th>How it supports students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual media</td>
<td>images, avatars, photos, clipart, audio, video</td>
<td>Provides visual representations in online contexts</td>
</tr>
<tr>
<td>Netiquette</td>
<td>Emoticons, phatics vocatives, pronouns</td>
<td>Enhances student communication and interactions; clarifies and underscores meanings</td>
</tr>
<tr>
<td>Frequency</td>
<td>Speed and immediate response/posting times</td>
<td>shows interest and engagement through timeliness of responses</td>
</tr>
<tr>
<td>Higher-order thinking (HOTS)</td>
<td>Problem-solving skills, critical thinking</td>
<td>Shows that students are contributing and reflecting beyond course content; asking probing questions, presenting new information &amp; ideas</td>
</tr>
<tr>
<td>Personal experiences</td>
<td>Personal stories, references to previous experiences, situations, people</td>
<td>Shows that the are risk-takers, open-minded, ready to accept feedback from others; can empathize and relate</td>
</tr>
</tbody>
</table>
The first component of participatory presence is visual media, which Roger referred to in Chapter 5. Visual media includes the use of photos, images, audio and video to enhance one’s online presence and virtual personality. Most ITE students used personal photos and other images to establish their online presence. The inclusion of video and/or audio components on Pepper is recommended as it would allow students to be both seen and heard, thereby enhancing their online personae and adding a new dimensionality to community development.

The second factor is Netiquette, which includes the use of emoticons, phatics, vocatives and inclusive pronouns to create a friendly atmosphere of trust and belonging. In Chapter 5, Marissa related how her students greeted and congratulated her on the Wall following her successful radio broadcast. One Option Coordinator used a smiley emoticon (😊) as part of her title banner and in Figure 19, students used smiley emoticons and inclusive pronouns (we, us, our) regularly on the Wall to express their emotions.
The third factor is frequency, which refers to the timeliness of one’s responses and postings. In face-to-face contexts, students can respond to another quickly by simply calling out or raising their arm. Unfortunately, online environments do not allow for this kind of reaction. Instead, the speed with which one comments to notes and/or private messages has become the new way to gauge one’s interest in and connection to content. Students who answer a comment quickly demonstrate an increased level of engagement. Donna’s discussion of icebreaker activities in Chapter 5 showed her desire to provide multiple opportunities for quick interactions prior to the startup of classes. In her interview, Louise praised Pepper for its notifications feature, which supports immediacy through email updates. Baker’s (2004) study of immediacy in Chapter 2 revealed that instructors significantly contribute to the effectiveness of a student’s online experience. Consequently, they must be willing to regularly invest time to respond to students as late replies to questions can be perceived and interpreted negatively.

The fourth factor of participatory presence is higher-order thinking skills or HOTS. This is where a student’s individual problem-solving and critical thinking skills delve beyond current material to examine other issues. These deeper reflections may generate questions that force the student to ponder and journey into new, unexplored territory. HOTS are also evident when students take risks and initiate discussions that are based on new ideas and concepts. Pepper provides an atmosphere for this type of questioning and commentary to germinate through private text messaging. While this is a good start, it is recommended that the Option Coordinators first meet to collectively define what HOTS means and looks like in the ITE program. Once it has been clearly articulated, examplars should be provided and posted in multiple conference areas as well as to the Announcements so that students can use them when preparing their own postings. This will support the formulation of postings that move beyond
the simple regurgitation of facts to a quality of note that incorporates all four elements of TPACK.

Finally, participatory presence includes the revelation and sharing of one’s personal experiences. Students and instructors who are able to freely disclose information about their pets, hobbies, trips etc., show that they have a healthy online sense of self and are confident in their abilities to engage in virtual contexts. These students are willing to take risks and accept feedback in the hope that they, too, may receive similar opportunities to learn about their fellow students. This became a reality for one student in Micki’s cohort, whose health issues forced his early withdrawal from the program. In Chapter 5, it was revealed that this student’s decision to share details about his illness forged a strong emotional class connection, which resulted in a class-wide hospital visit a month later.

7.3.7 Future considerations and new Pepper features

Toward the end of their interviews, the administrators and Option Coordinators were asked to suggest how they would improve upon Pepper’s current features and functionality. The ITE students were also asked for their input and thoughts in their online exit survey. Data analysis revealed three suggestions: online meetings, shared conferences and cross-cohort online repositories. Each one will be briefly described here.

7.3.7.1 Online meetings

People who are geographically distant can still collaborate in virtual environments thanks to videoconferencing. One popular example of a web-hosted service is www.gotomeeting.com, where up to 25 attendees can participate in an unlimited number of meetings. In his interview, Roger indicated that this type of online interaction is currently not a Pepper feature as video conferencing requires:
…a level of sophistication that is beyond the scope of Pepper and it usually requires special software like Adobe Connect…something beyond just a simple web browser that can actually collect and encode video. (R.R., 2013)

Although Pepper currently functions as a browser-based tool, Roger noted that:

…within Pepper we have the ability to create a special button on the main menu bar and so when we want to do things like having a webinar, we simply put a button the main menu bar of Pepper called “webinar” and students click on it and it launches Adobe Connect. (R.R., 2013)

7.3.7.2 Shared conferences

Roger’s desire to bring different cohort communities together has enjoyed some limited progress thanks to an innovation that:

…allows conferences to be shared across communities. You don’t really have this in any other software that I know of although perhaps other programs have done it. For example, in [Community A], typically we have a bunch of conferences or folders where different things are talked about. And…[Community B] has its own folder. And this is the way things are set up where each community has its own folders…but what we’ve done is we’ve set it up so that some of these folders can be shared. So a folder that is visible in [Community A] is also visible in [Community B]And if a student in [Community B] adds a message into this special folder. Then the people in [Community A] will see it and so forth. (R.R., 2013)

The development of a shared-folder functionality was first implemented by Roger and Donna to address a need for mathematics support. While this is one way of breaking down the silos that can often build up around individual programs, Roger feels that Pepper needs to move forward and continue development in this particular area.

7.3.7.3 Cross-cohort online repositories

Roger likes the idea of establishing an online repository where resources can be shared across all university classes that use Pepper. Currently, each ITE cohort environment has its own Community Resources area for the uploading and sharing of materials. Roger’s ultimate goal is
to make everything shareable across all cohort groups and university classes. This plan already appears to be in motion, as certain conferences and calendars are already being shared across different ITE cohorts. If this model is to succeed, however, Roger feels that personal resources should also be shared. One way to achieve this may be through the creation of different folder types:

We could have a newsfeed type of folder, then a conference type of folder and then one with resources in it. And a fourth type of folder that we could have is like a dropbox folder, right? So yeah, I can imagine at least 3 or 4 different types of folders and you could just say when you create a folder, “I want it to be this kind of folder”. (R.R., 2013)

One issue of concern is whether or not people will actually want their resources to become part of a public folder. Even if they do, Roger is not sure how this could be realized on Pepper. He admitted that this is something that requires additional consideration and examination prior to implementation.

7.4 A look to the future of ITE and Pepper

This investigation sought to understand how a virtual learning environment could support community-building in an ITE program at an Ontario university. Through the creation of a case study featuring the Pepper learning management system, administrators and Option Coordinators were interviewed for their perspectives, insights and reactions. A mixed-methods approach resulted in the collection of both qualitative and quantitative data in order to generate results that could be then interpreted and analyzed for discussion. Based on these findings, Pepper appears to have been positively perceived by instructors and was used in a variety of different ways. While the Option Coordinators did not use some features on a regular basis, the development of training sessions for both instructors and the students will improve Pepper’s use as both a social media tool and virtual classroom. Concerns about the frequency and type of interactions taking place online can be addressed by integrating principles from the TPACK and SAMR models.
Graphic representations via the generation of connection diagrams will also serve to inform instructors about the effectiveness of their pedagogy and level of engagement with their students.

As Pepper prepares to enter its fourth year in the ITE program, it is hoped that the administrative team will take time to consider the six different recommendations that have been suggested herein. Based on the research data presented, it is felt that these suggestions will not only enhance Pepper’s ability to support community-building, they will also contribute to the development of effective, 21st century educators.


Yang, C-C., Tsai, I-C., Kim, B., Cho, M-W., & W Laffey, J. (2006). Exploring the relationships between students’ academic motivation and social ability in online learning environments. *Internet and higher education, 9*, 277-286.


Appendix A: Interview questions for Roger

1) How many databases have you created in Pepper?

2) Can you speak to how these databases are used by department faculty?

3) Please describe several Pepper features that you feel encourage communication and the development of social presence and engagement among participants.

4) How did the Pepper database come to be involved in the ITE program?

5) Can you speak to the process of establishing these online communities for the ITE program. Was a committee set up to discuss particular design features?

6) Which specific features were built into the ITE virtual learning environments?

7) Have you ever facilitated or participated in any online environments?

8) Please describe how visual media is used in Pepper environments.

9) What do you feel is a major challenge in fostering ongoing interactions among students or between students and instructors?

10) In your estimation, were any Pepper features excluded that might otherwise support learning and online interactions?

11) Have you elicited the opinions of the Option Coordinator and/or online instructors with respect to new Pepper design features?

12) Are there any changes or additions that you are considering for future virtual learning environments?
Appendix B: Interview questions for Donna

1) Can you provide some background in terms of how virtual learning environments came to be introduced and incorporated into the ITE program?

2) According to your original vision at the time, what was the purpose or goal of these online cohort groups?

3) How were these online groups organized, given the large number of ITE students?

4) What instructions or guidelines, if any, were given to the online instructors overseeing these groups?

5) What instructions or guidelines, if any, were given to the students?

6) A) What technological (web 2.0) features were important for you to include in these virtual learning environments?
   B) How do you think these specific features will impact upon communication between students and their instructors?

7) One challenge associated with virtual learning environments is the development of social presence. How will these cohorts be used to support and encourage social engagement among students and instructors?

8) One disadvantage of online learning is its inability to support verbal immediacy behaviours, which is important in facilitator-student interactions. What impact did the virtual learning environments have on this?

9) Cohort-based learning is viewed as a learning model characterized by affiliation and a sense of purpose. What impact did the ITE virtual learning environments have on this?
Appendix C: Interview questions for Louise

1) Louise, can you please describe how you first became involved with the MT program at the university?

2) Please explain your role as Communications Coordinator (CC). What were your duties and responsibilities?

3) How was the Pepper database introduced into the MT program?

4) a) Can you describe some of the design features that were chosen for student use?
    b) Why were they specifically selected?

5) What were some of the goals that you were hoping to achieve in terms of enhancing student learning?

6) Were instructors given specific instructions in terms of facilitating the database?

7) Please describe any challenges that you encountered with Pepper.

8) Please describe any successes that occurred as a result of incorporating Pepper into the MT program.

9) In what ways did Pepper strengthen the MT in your opinion?

10) Were you able to discuss the virtual learning environment with instructors? What were their thoughts and/or reactions?

11) Did you receive feedback from students in terms of what they felt were strengths and challenges?

12) What changes would you make or suggest going forward?

13) Is there anything else that I should know that has not yet been addressed?
Appendix D: Interview questions for the Option Coordinators

1) Can you provide some background in terms of how you became an option coordinator for the ITE program?

1a. How many years have you participated as an option coordinator?

1b. What are your responsibilities as a coordinator?

1c. How do you and your partner coordinator divide up duties?

1d. Do the students in your Option run their own social media site (e.g., Facebook)? If so, are instructors invited to participate on that site?

2) Did you receive Pepper training, instructions or guidelines during the start up process last fall?

3) Did your students receive Pepper training, instructions or guidelines during the start up process last fall?

4) What instructions, guidelines or expectations, if any, did you personally give to your students concerning Pepper?

5) At the beginning of this year, did you have any specific intentions or plans for your use of Pepper? (If yes, what were they?)

6) What do you personally use Pepper for, as an instructor and Option Coordinator? Please describe some of the features that you regularly use.

7) What are some of the different ways that the instructors in your Option uses Pepper?

8) Are there any Pepper features that you don’t find useful? What new features or suggestions would you like to see in Pepper?

9) What role, if any, does Pepper play in terms of helping you build a sense of community in your Option?

10) Do you have any other observations or comments to share about Pepper and its use in your cohort?

Thank you for your time!
Appendix E: 2013 Pepper ITE student exit survey questions

1) How effective was Pepper in **supporting the community** in your cohort?
   a) not at all effective
   b) slightly effective
   c) somewhat effective
   d) very effective
   e) extremely effective

2) In what ways was Pepper used to **support the class community** in your cohort?

3) In what ways did Pepper **support your learning**?
   a) instructor’s document repository
   b) coordinator’s document repository
   c) communication channel to coordinator for questions
   d) communication channel to instructors for questions
   e) submission of assignments
   f) access to lesson plans, teaching tools, etc.
   g) messaging other students
   h) discussion with other students
   i) collaborating with other students
   j) social connections
   k) scheduling (calendar)
   l) access to feedback from instructors
   m) access to feedback from coordinators
   n) access to feedback from peers
   o) other (please specify)

4) In what ways could Pepper be improved to **facilitate your learning**?
Appendix F: 2013 student exit survey results

- Between April 12, 2013 and May 6, 2013, 73 respondents completed the short 4 question survey.
- Overall, the respondents found Pepper to be extremely effective in supporting the cohort community, with only 3 respondents reporting that Pepper was only slightly effective.
- Of the ways in which Pepper supports learning, all uses were reported by the majority of respondents, with access to feedback from peers and scheduling being the least used features:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor’s document repository</td>
<td>61</td>
</tr>
<tr>
<td>Coordinator’s document repository</td>
<td>58</td>
</tr>
<tr>
<td>Communication channel to Coordinator for Q</td>
<td>60</td>
</tr>
<tr>
<td>Communication channel to Instructors for Q</td>
<td>58</td>
</tr>
<tr>
<td>Submission of Assignments</td>
<td>67</td>
</tr>
<tr>
<td>Access to lesson plans, teaching tools, etc.</td>
<td>66</td>
</tr>
<tr>
<td>Messaging other students</td>
<td>68</td>
</tr>
<tr>
<td>Discussion with other students</td>
<td>62</td>
</tr>
<tr>
<td>Collaborating with other students</td>
<td>61</td>
</tr>
<tr>
<td>Social connections</td>
<td>51</td>
</tr>
<tr>
<td>Scheduling (calendar)</td>
<td>42</td>
</tr>
<tr>
<td>Access to feedback from Instructors</td>
<td>58</td>
</tr>
<tr>
<td>Access to feedback from Coordinators</td>
<td>54</td>
</tr>
<tr>
<td>Access to feedback from peers</td>
<td>43</td>
</tr>
</tbody>
</table>

While one respondent commented that “I don’t think any improvements need to be made,” three simply said that it was great, and another said “I cannot think of anything,” some of the design suggestions included:

- Breaking the home page into sections/larger class wall
- Repositioning of features
- Simplifying the “read all” feature
- Improved search function
- Uniform use of Pepper (not Pepper and Blackboard for different classes)
- Mobile access
- Improved notifications
- Reordering of notes/announcements
- Ability to set up personalized groups for messaging/Improved private messaging
- Access to other cohorts
- Expandable windows
- An archiving feature

Others were looking for additional uses such as:

- More collaboration
- Reorganization of class use (for example, “have 1 place to post assignment related info rather than 40 different places”) – perhaps more training for instructors on course layout and design on Pepper
- Live video/chat