Transformational leadership, Communication Modalities and E-Learner Satisfaction

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Abstract

E-learners indicate that they want to have access to the same leadership and guidance that they experience in a classroom; specifically, e-learners want their support to include more interaction and dialogue with their instructor and peers (Cole & Kritzer, 2009). Because of the strong relationship that exists between the transformational leadership style used in a classroom and the engagement and satisfaction of learners (Pounder, 2006), the researcher posits that providing specific interactive social support in online courses will increase e-learners’ emotional satisfaction. To further the improvement of online learning and to increase the satisfaction of e-learners, the researcher’s question was: What impact will the use of interactive social support in the design of online courses have on the sense of community, level of social interaction, and emotional satisfaction of e-students in Trades mathematics? To facilitate transformational leadership in online learning, the researcher designed and implemented introductions/check-ins, video lesson challenges, virtual office and classroom activities, and Facebook, into online lessons at Vancouver Island University, as multimodality communication techniques. A mixed method action research study was conducted to determine if there was a change in the sense of community, level of social interaction and emotional satisfaction for e-learners. Quantitative and qualitative data was compiled and coded. The key themes, that emerged, indicated that a strong relationship does exist between the use of transformational leadership principles to design interactive communication modalities, used in online learning, and the stimulation of an e-learners’ sense of community and level of social interaction.
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Chapter One: Introduction

Purpose of the Study

The purpose of this study was to acknowledge the needs and expectations of e-learners and to learn how the elements of transformational leadership could be used in the design of online courses to reduce the level of anxiety and frustration for e-learners. The goal of this study was to identify socially interactive multimodal support for e-learners in order to create a sense of community, a high degree of social interaction and to increase emotional satisfaction for electrical apprentices learning trades mathematics.

Although online courses have become more prevalent each year, studies indicate that there is a problem. E-learners have indicated that they wanted to have access to the same leadership and guidance that they experience in a classroom; specifically e-learners wanted their support to include more interaction and dialogue with their instructor and peers (Cole & Kritzer, 2009). Lee, Srinivasan, Trail, Lewis, and Lopez (2011) disclosed that a student’s degree of satisfaction in online courses is significantly related to the type of support they felt that they received. Some students became disenchanted and failed courses that did not incorporate ways of interacting with the instructor and other students.

As an educator, an electrician and a lifelong learner, the researcher has completed many levels of education both in the classroom and online. In the classroom, her level of engagement was higher when more of her senses were stimulated. She also found that she understood more of the concepts, and that she was more excited about the learning process, when she could discuss and confirm her interpretations with her instructor and the other students. However, in the researcher’s experience, online learning utilized lonely exercises that consisted of reading and answering questions. With online courses she felt isolated, bored and frustrated. The researcher had to question why she was happy in the classroom and dissatisfied with her online experiences.
She realized that her degree of satisfaction was directly related to the level of social interaction and support she received in the course.

Electrical circuitry is taught using mathematics and some of the researchers students have found this to be a challenging component of the apprenticeship courses. These students have trouble visualizing mathematical concepts and may benefit from access to online video instruction and interactive exercises. As an educator, the researcher felt online courses would increase access to learning materials for her students; however it was extremely important for her to provide them with positive online experiences. To achieve this, the researcher decided she would need to determine what modalities could be used to include social interaction and support in order to turn those negative online experiences around.

**Justification of the Study**

The researcher’s examination of prior research identified some of the challenges that e-learners face. Lee et al. (2011) explained that their survey results revealed that online students wanted their experience to include support through social connections to their peers and their instructor. Vygotsky’s research underpins the importance of including social, cultural and historical context in learning environments and this sets the framework for the facilitation of social interaction in online courses. This is a challenge because, in spite of the online learning platform, e-learners still wanted to be engaged with their class and instructor. E-learners valued group work within the course and wanted a learning environment that included group projects and discussions. E-learners also wanted to have opportunities to learn from their peers through peer teaching, tutoring and facilitation. In order to feel supported by their instructor, e-learners indicated that they wanted the instructor to be participatory. They needed the instructor to facilitate study groups and review sessions and be available for feedback and advice. In fact most e-learners identified that the “most severe barrier” they faced was a “lack of social interaction”
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(Lee et al., 2011, p. 159). For students participating in online courses that did not incorporate traditional classroom activities such as mentoring, peer tutoring and group projects, the onus was on the students to self-regulate and learn on their own which led to disappointment and dropout.

Incorporating social interaction into e-learning environments presented specific challenges for course designers, and Cole and Kritzer (2009) reasoned that the development and implementation of effective online courses was inhibited by the lack of instructor training. Therefore it was necessary to examine how to improve instructor training to include the interactive social support. Ley and Gannon-Cook (2014) proposed that although the effectiveness of online course design was driven by “instructional effectiveness”, and that participation and completion was related to “instructional appeal” (p. 24). E-learners value instructors that are trustworthy and participatory, who have great communication skills and promote a sense of community, and who can motivate learners to achieve their goals (Lee et al., 2011). In other words, while it was very important that a course was well organized and tasks were clearly identified with specific outcomes; it was also very important that e-learners found the method of instruction to be appealing. A key indicator of transformational leadership is the incorporation of strong social dynamics, and findings by Pounder (2006) indicated that teachers were perceived to be “exemplary” teachers when they applied transformational leadership behaviours within the classroom (p. 540). Pounder (2006) disclosed that transformational classroom leaders developed inspirational and trusting relationships with their students which contributed to enthusiastic and metacognitive development of the student’s interest. This led to the question of whether transformational leadership characteristics could inform the design of online courses to facilitate the delivery of social support for e-learners.
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Brazeau’s (2008) argument that “leadership and learning were indispensable to each other” (p.1) was reinforced in the e-learning context by Kahai, Jestire, and Huang (2013) whose study indicated that by implementing transformational leadership practices in “computer supported collaborative learning” (CSCL), e-learners were likely to experience greater satisfaction and improve their metacognitive ability. A definite relationship existed between the transformational leadership style used in a classroom and the engagement and satisfaction of learners (Pounder, 2006). This review of the research indicates that by examining the relationship between transformational leadership, sense of community, social interaction and support modalities, it may be possible to improve emotional satisfaction of an e-learner.

Research Question and Hypothesis

To further the improvement of online learning and to increase the satisfaction of e-learners, the research question was: What impact will the use of interactive social support in the design of online courses have on the sense of community, level of social interaction, and emotional satisfaction of e-students in trades mathematics? The researcher hypothesized that, because of the effect of transformational leadership characteristics, the impact of incorporating interactive social support into the design of online courses would lead to a high level of satisfaction among e-learners.

Definition of Terms

The term transformational leader is a well-used term and has been defined by many researchers. Pounder (2006) described the transformational leader as a person who assisted in the visualization of goals and visions, instilled pride, gained trust and promoted creative problem solving through individual coaching, mentoring and feedback. Curtain (1997) wrote that a transformational leader is “a great communicator----and what he/she communicates is a vision worth sharing, a goal worth achieving, and---most important of all---an affirmation of the
follower’s worth” (p. 8). A transformational leader’s high levels of passion, energy and enthusiasm were a catalyst for change that leaves individuals feeling good about themselves and their accomplishments (Pounder, 2006).

While the Merriam Webster free online dictionary defines community as “a group of people with the same interests”, researcher Chivas, Hogge, McMillan and Wandersman (1986) theorized that a sense of community held a broader meaning that included sharing emotional connections. This was supported by McMillan (1996) who maintained that the “spirit of the sense of community” was derived from “the spark of friendship” (p. 315). For the purpose of this research, sense of community will include emotional connectedness and friendship. For the purpose of this study, the e-learners’ sense of community was measured with respect to the level of comfort that they reached in relationships with the other e-learners and whether these relationships were caring and meaningful.

Roblyer and Wiencke (2003) designed a rubric to measure the degree of social interaction in online courses and identified five areas of social interaction. These were rapport-building for interaction, instructional designs for interaction, interactivity of technology resources, evidence of learner engagement, and evidence of instructor engagement. The rubric identified that a high degree of social interaction occurred when the instructor provided detailed feedback within 24 hours and encouraged and developed an online structure that promoted social fellowship through peer-to-peer and instructor-to-student interaction. Furthermore the rubric identified that the instructor needed to facilitate two-way exchanges using visual technologies and synchronous voice communication and create other interactive activities that would result in 90 to 100 percent of the students voluntarily initiating and replying to messages (Roblyer & Wiencke, 2003). For the purpose of this study social interaction was measured, using student
self reporting, with regards to the opportunities for, and quality of, interactions between the e-learners, their peers and their instructor with respect to exchange of ideas, discussions and learning.

For the purpose of this research, *emotional satisfaction*, is defined as the personal satisfaction of e-learners, with regards to cultural and intellectual conditions, and how these conditions relate to the state of the e-learner’s emotion with regard to pleasure.

The term *online learning* is used to describe the learning that takes place outside of traditional face-to-face classroom activities. *Online learning* is distance learning; however it is different from self-study distance learning in that it includes interactivity between the instructor and the students and peer-to-peer student activities. A term sometimes used for *online learning* is *computer supported collaborative learning* (CSCL). The data for this research will be collected from five *blended online lessons*. *Blended Online* is the term used to describe courses that utilize both face-to-face classroom activities and *online learning* to deliver instruction. For the purpose of this study, the *e-learners* were the Electrical Program students, enrolled at VIU, who completed the majority of their training in a traditional classroom and a portion of their training online using a computer at a location of their own choice.

The Oxford online dictionary describes *modalities* as a particular method or procedure and for the purpose of my research, modalities were the methods used to provide online support. Wikipedia’s interpretation of the term *multimodality* is described as communication practices that use several modes to communicate. These include the use of textual, aural, linguistic, special, and visual resources to increase the audience’s reception of an idea or concept. For the purpose of my research, *multimodalities* referred to types of online communication and support that could be used to create a sense of community and promote a high degree of social
interaction between the instructor and the student and peer-to-peer. In this research, Introduction/check-ins, Video Lesson Challenges, Virtual Office Visit, Virtual Classroom and Facebook were the modalities that the researcher used.

**Overview of the Study**

To further the improvement of online learning, and to increase the satisfaction of e-learners, this mixed methods case study examined which multimodal supports could be used by a transformational leader, in the design of online courses, to promote a sense of community, a high level of social interaction, in order to increase the emotional satisfaction for e-students learning trades mathematics.

This research was approved by the Vancouver Island University Ethics Board in 2015. In 2015, willing participants from a convenience sampling of the Entry Level Electrical Foundation Program at Vancouver Island University (VIU) participated. Using the principles of transformational leadership five online lessons were designed in order to improve social interaction. Observations were then made about the students’ sense of community and level of interaction.

Data was collected over four weeks, from five lessons that taught electrical math for Direct Current (DC) circuitry using an online platform. Target math topics were series, parallel, and combination circuits. Online access gave the students 24/7 access to instructional aides such as videos, worksheets, and synchronous and asynchronous communication.

To examine the effect on instructor-to-student and peer-to-peer communication, and to encourage social interaction, the modalities that the researcher used were: introductions/check-ins, video challenge lessons, virtual office hours, virtual classroom, and Facebook. Email contact was made with each participant at the beginning of the online lessons and virtual office hours were pre-arranged to facilitate instructor-to-student interaction, mentoring and feedback. Video
lesson challenges were designed to increase social interaction. Check-ins that encouraged the use of photos and videos, and Facebook were used to increase the sense of community for the participants.

A triangulation matrix was used to ensure validity of data. The researcher collected data through the use of online surveys and self-reflective journaling. The surveys asked the e-learners about the specific modalities and, the impact that they had on the e-learners’ sense of community and level of interaction. Mini-surveys were given after each of the five online lessons and a post-survey was used to collect data after all of the online lessons were completed. The mini-surveys consisted of 10 Likert scale questions and one open ended question. The post-survey consisted of 20 Likert scale questions, seven open questions and four demographic questions. Additional rich data was collected by journaling after each lesson.

Quantitative results were analyzed and the relationships between the specific modalities and the sense of community and the degree of interaction were graphed. From the frequency of e-learners’ comments, the qualitative data from one open ended question in the mini-survey and seven open ended questions in the post-survey were coded to identify emerging themes about the effect that the specific modalities had on the e-learners.
Chapter Two: Review of the Literature

Research shows, that online courses must be designed to provide support that is valued by the students (Lee et al., 2011). Students want instructors that they can trust, who provide good feedback and are available. E-learners value learning communities that provide social interaction and a supportive environment. Specifically, Kahai et al. (2013) argue that leadership within a computer supported learning environment is instrumental in relieving the sense of isolation that an e-learner feels; and that it is essential that the instructor actively manage the learning process by encouraging participation and promoting the e-learner’s perception of self-worth. While instructional leadership focuses on the instructor’s accountability, academic rigor and ability to clearly identify the outcomes, it does not target emotional support for e-learners (Dumitrascu, 2008). A transformational classroom leader builds inspirational and trusting relationships with their students which contribute to enthusiastic and metacognitive development of the student’s interest in a subject (Pounder, 2006). Results of a study conducted by Kahai et al. (2013) strongly suggest that during computer supported learning, cognitive effort and satisfaction of the e-learner is increased with transformational leadership. Because online learning is different from traditional face-to-face classes, care must be taken when designing online courses. A variety of modalities can be used to facilitate social interaction and build a sense of community. These include synchronous and asynchronous formats and the inclusion of internet tools, multi-media and social media. Transformational teaching and carefully designed online courses are critical aspects that affect the performance and satisfaction of e-learners.

Student-Valued Supports in E-Learning

E-learners indicate that they want to experience the same types of support that they see in a traditional classroom. Cole and Kritzer (2009) argue that students want instructors to set clear goals and deadlines, but know when to be flexible; and instructors that can also facilitate a
course that is organized, well planned and worthwhile. Cole and Kritzer (2009) go on to say that although it is common that students and instructors never meet during an online course, students still want to feel that they have a personal connection with their instructor and peers. Students need to be able to easily connect with their instructor, and working with other students is viewed as valuable because it helps e-learners stay motivated especially when the course work is challenging.

Research, by Hew (2015), shows that the interaction between the student and the instructor is instrumental for improving student engagement in e-learning. Having trustworthy and participatory instructors who have a strong, motivating social presence and who communicate effectively are key elements that e-learners identify as important to their success and satisfaction (Cole & Kritzer, 2009). When 170 online students were polled, they identified that one of the most valuable contributions that an instructor can contribute is good communication. In fact,

the top five most-valued instructor interactions were (1) check e-mail to assess learner needs, (2) posted discussion board, (3) provide examples, (4) provide timely feedback, and (5) respond to student inquiries. (Ley & Gannon-Cook, 2014, pp. 24)

Lee et al. (2011) argue that to be successful, students feel that it is imperative for the instructor to be available and that they respond quickly with assistance and feedback. They posit that the feeling of isolation known as “transactional distance” is lessened with better communication between the instructor and the e-learner (p. 159). To provide transformational leadership support for the e-learners in this research, the researcher chose to use the virtual office visit and the virtual classroom to provide synchronous opportunities for the instructor to interact and provide feedback to each student.
Fredricks, Blumenfeld, and Paris (2004) tracked the importance of affective engagement in e-learning. They argue that a key factor in engagement during learning is the emotional state of the student. When students have a positive feeling about their instructor and peers, their level of engagement increases and they feel better about school and learning. Vygotsky’s (1978; 1986) social constructivism theory underpins the need to build opportunities for social interaction into education because learning is shaped through the social, cultural and historical context that people are exposed to. Vygotsky’s research supports the concept that students will benefit from instructors that facilitate social interaction in online courses.

The challenge with an online platform is that although students really want a solid social network, without proper facilitation, it can be difficult to connect with other students and the teacher online. To provide e-learners with the type of support necessary to promote satisfaction and success, it is important that the design of online courses include provision for interactive support and communication between the e-learners in a class and the instructor. Slavich and Zimbardo (2012) outline active learning, student centered learning, collaborative learning, experiential learning, and problem based learning as five key elements necessary to facilitate social interaction in the classroom. Jacobs (2013) reveals that a common mistake in online course development is that some instructors shy away from developing socially interactive activities into their courses because of the time it takes. For this research, the researcher did require extra time to develop the modalities that would facilitate interaction and to build community between the instructor and the students and between the students. Asynchronous interaction was encouraged through the use of Facebook, the video lesson challenges and the introduction/check-in activities. Synchronous interaction was stimulated during the virtual classroom group activity.
Attributes of a Transformational Leader

The attributes of a transformational leader have been identified using various terminologies. Bass and Avolio (1995) specifies that “idealized influence” (instilling pride, gaining trust), “inspirational motivation” (assisting in visualization of goals and visions), “intellectual stimulation” (promoting creative problem solving) and “individual consideration” (providing coaching, mentoring, feedback and addressing individuals concerns) are the four factors that a transformational leader exhibits. When used consistently, transformational leadership behaviors promote satisfaction and success in followers because the transformational leader is “a great communicator---and what he/she communicates is a vision worth sharing, a goal worth achieving, and-- most important of all—an affirmation of the followers’ worth.” (Curtin, 1997, p. 8).

The influence of the four key elements of transformational leadership behaviour can inspire followers to visualize and strive towards successful outcomes (Ruggieri, Boca, & Garro, 2013). Firstly, the integrity of a transformational leader promotes a trusting relationship and the learner can trust that the leader will be committed, consistent, fair and predictable (Curtin, 1997). Transformational leaders promote pride and instill confidence in their learners by believing in their capabilities and secondly, transformational leaders can isolate the ideas that stimulate people to realize a vision so they can make the changes necessary to achieve the goals (Curtin, 1997). Thirdly, to promote intellectual stimulation, transformational leaders provide pathways to enhance cognitive and metacognitive processes of the learner (Ruggieri et al., 2013). Yildirim and Ersozlu (2013) argue that increasing an individual’s metacognition leads to heightened self-awareness and the ability to assess their own thought processes. The last and perhaps the most important trait of the transformational leader is the attention they give to the individual. Such
leaders recognize and celebrate the uniqueness of each person which raises the perception of the learners’ self-worth and leads to increased levels of satisfaction (Kahai, Jestire, & Huang, 2013). Transformational leadership behavior is essential support for followers to be successful and happy. The researcher designed the interactive activities, in this research, to promote student metacognition and self worth through personalized conversations between the instructor and the student.

Slavich and Zimbardo (2012) found that there are a significant number of studies which confirm that student performance and satisfaction improve when transformational leadership principles are used in education. Slavich and Zimbardo (2012) suggest “that transformational leadership is a critical feature of transformational teaching and that, when applied successfully, transformational teaching can maximize students’ potential for academic success, and significantly enhance students’ attitudes, values, beliefs and skills” (p. 580). There is strong evidence that incorporating transformational leadership behavior into the design of online courses will significantly improve the success and satisfaction of e-learners.

**Increasing E-Learner Satisfaction through Leadership**

The methodologies used in the design of *Computer Supported Collaborative Learning* (CSCL) are extremely important and need not only to clearly outline tasks and outcomes but to also provide emotional and interactive support for e-learners. Specifically e-learners need to be given clear learning outcomes and their instructors need to motivate and inspire e-students by promoting a supportive interactive connection (Kahai et al., 2013). This means that e-student performance is dependent on how the course materials are structured, how well the concepts are presented, meaningful interactions with their peers, and whether the student finds the instructor approachable.
To improve e-learners’ performance and satisfaction, the design of online courses must effectively address two distinct aspects. Firstly, the tasks within a course must be clearly identified and presented in a way that they are easy to understand. The process of incorporating tasks into an online course is relatively transactional in nature and includes clearly identifying the task, ensuring that the e-learner understands what outcomes are expected and confirmation of completion when targets are achieved (Kahai et al., 2013). Support for transactional elements tends to be primarily of the technical nature.

Secondly the e-learner must be interactively emotionally supported throughout their course. Student performance is dependent not only on how the course materials are structured and how well the concepts are presented, but whether the students find the instructor approachable and supportive. “Instructional appeal” occurs when the online course is designed with attention to the needs of the e-learner, and e-learners value instructors that are helpful and present (Ley & Gannon-Cook, 2014). Careful, intentional communication between the instructor and the student plays an important role in the satisfaction of a student. Since success and satisfaction of the e-learner is dependent on access to interactive social supports (Kahai et al., 2013); it follows that the type of social support e-learners receive during their course is very important.

The perception of an instructor’s appeal depends on their ability to build social connections into a course. Even though physically there may be many miles between the instructor and e-learner, the instructor will need to be “visible” and encourage interaction. E-learners’ performance improves when they receive feedback in a timely manner; perceive stronger support and receive emotional rewards for their efforts (Roblyer & Wiencke, 2003). For social presence to be effective the e-learner must feel that they can get one-on-one help with the
material and can approach the instructor for advice and counselling with relative ease (Lee et al., 2011). The design of this action research included modalities that were chosen to promote e-learner performance and satisfaction.

Salmon (2002) introduced an online teaching model that embodies both the transactional and the emotional elements necessary to build an effective online course. The first step, in this model, is to help the students get settled in the course. This is achieved through interaction, encouragement, warmth and technical assistance. Second is facilitation of opportunities for the students to connect socially within a social and cultural learning environment. The third element is facilitation and support for the student to access and understand course materials followed by an interactive process to assist with knowledge construction. The last element accommodates and provides encouragement in the achievement of each student’s personal goals. Salmon’s model touches the heart of what students would like in online courses. To provide support and build community, the online lessons in this research were designed in line with Salmon’s online teaching model framework.

Ruggieri et al. (2013) strongly recommend the implementation of specific leadership techniques to motivate groups in e-learning environments. Findings from leadership studies support the theory that transformational leadership techniques used in businesses and organizations produce similar outcomes when used in a classroom setting (Pounder, 2006). Crowther (1997) supported the use of “transformational classroom leadership” principles because this leads to exemplary performance by the students.

Slavich coined the phrase transformational teaching (Slavich & Zimbardo, 2012). Slavich describes transformational teaching as a means to change the way that students learn by promoting life changing experiences and he argues that this change is achieved through dynamic
interactive relationships between the instructor and the student. Rosebrough and Leverett (2011) posit that transformational teaching changes the learner “academically, socially, and spiritually” (p. 16).

The literature reviewed indicates that a transformational leader has the ability to support e-learners in ways that they find very valuable. E-learners value instructors that are trustworthy and participatory, who have great communication skills and promote a sense of community, and who can motivate learners to achieve their goals (Lee et al., 2011). Students want instructors that respect and ignite their cognitive abilities and allow for the uniqueness of each individual (Ley & Gannon-Cook, 2014). The transformational leader instills pride, gains trust, assists in the visualization of goals and visions, promotes creative problem solving and provides coaching, mentoring, feedback and addresses individuals’ concerns (Pounder, 2006). Designing online courses that integrate transformational leadership principles will provide e-learners with the critical elements that they value. The modalities used by this researcher were chosen to create transformational teaching opportunities.

**Application of Transformational Leadership Principles in E-Learning**

Research supports the concept that teaching online is dramatically different to traditional teaching and that to design an effective course, traditional instructors must change the way that they teach and adopt teaching strategies that incorporate meaningful interaction into the course. (Dasher-Alston, & Patton, 1998; Jacobs, 2013; Kinnie, 2012). It is reasoned that key elements such as the delivery, the communication and in fact the courses themselves will need to be structured differently (Fish & Wickersham, 2009). Jacobs (2013) asserts that because of the constant change in technology, creativity must be used by the instructor so that the e-learners
have a variety of ways to use the computer to foster interaction with their peers and their instructor.

Findings by Kahai et al. (2013) indicate that CSCL facilitators can improve the quality of cognitive e-learning and increase the level of enjoyment when transformational leadership behaviors are implemented into e-courses. Transformational support in e-learning can utilize both synchronous and asynchronous activities. While synchronous elements such as chat and live video occur in present time; asynchronous elements such as email and discussion boards are affected by a time delay (Cole & Kritzer, 2009). Presently there are tools available to deliver support to the students; however the challenge is to incorporate the modalities so that transformational leadership principles are effective.

Incorporating synchronous activities into e-learning provides an opportunity for the students to connect in real time with their instructor and/or peers. These activities make use of programs such as Blackboard Collaborate and Skype for virtual office hours, virtual classrooms, virtual web tours, video live chat and telephone conferencing. A great way to increase the instructor’s presence is regular virtual office hours and telephone conferencing (Cole & Kritzer, 2009). Setting up a weekly video live chat with students helps relieve the feeling of isolation, encourages students to stay focused and provides each student with an opportunity to ask for help or clarification of tasks. Interaction in this way will increase the e-learner’s perception of instructor accessibility. Online text chat is a great way to foster brainstorming activities and encourages community interaction when it is facilitiated effectively. E-learners welcome the opportunity to formulate their thoughts clearly and are not affected by traditional face-to-face relational conflict with other students (Ruggieri et al., 2013). Electronic voting systems give students instant feedback and relieve stress related to face to face questioning. A key advantage
to synchronous activities is that they provide the e-learner with opportunities to keep asking questions until they are satisfied (Cole & Kritzer, 2009). Blackboard Collaborate was used in this research as interactive software for the virtual office visit and the virtual classroom synchronous activities.

Asynchronous activities, such as discussion boards, forums, email, voice mail, multimedia and social media can also be implemented in ways that increase e-learner satisfaction. Hew (2015) maintains that the discussion board is a great way to communicate and foster a sense of community. It was described by one of his students as an “unsung hero”. Cole and Kritzer (2009) found that discussion boards provide opportunities for students to interact with the instructor and can provide a “Getting to know you” atmosphere (p. 39). They state that discussion boards also promote a community atmosphere without the same pressure that exists in face-to-face learning environments. Cole and Kritzer (2009) maintain that trusting relationships develop when forums are used by the instructor to validate the e-learner’s viewpoint. Email and voicemail are also effective means of increasing the instructor’s social presence, especially if they are answered in a timely manner. Hew (2015) reasons that setting up a dedicated email for each course and responding to questions within two hours is very effective. With asynchronous activities, students do not feel pressured to respond immediately, can take time to formulate their responses and still feel that they are being heard.

Multi-media such as video and power point provide opportunities to deliver course materials and increase social presence. Hew’s (2015) research provides valuable insight into the use of videos in online courses. His strategies include “bite sized” videos that are easy to understand. Videos need to be up to date and relevant and delivered by a variety of lecturers. Hew also determined that students value captions on the videos and notes or slides to accompany
the video. Technically it is an advantage if the students can download the video and vary the speed of the audio. Students also report increased social presence when the videos are produced by the instructor. Jacobs (2013) posits power point presentations also need to be presented in short segments and are more effective when coupled with audio and visual aids. Multi-media can be used in many ways to increase social connectedness.

Jacobs (2013) also argues that today’s social media has an ever changing face and coupled with mobile devices offers dynamic potential for online courses. Facebook, Twitter, Linkedin, Instagram, Snapchat, messaging and blogs are just some of the offerings that provide opportunities to communicate, and diversity in social and cultural connectedness. Google Docs and wikis are well known online tools that are great for collaborative group work and file sharing. Social media provides dynamic and interesting opportunities for instructors and students to work together.

Jacobs (2014) surmises group work as an extremely important online learning tool. It provides students with opportunities to interact and communicate effectively. Jacobs posits that participants should be allowed to pick their own group, decide on the norms for their group and evaluate their group members and themselves. If group work is designed correctly and students are expected to reach a consensus, then they will experience the need to collaborate. Jacobs mandates that working on properly designed group projects can create dynamic results where “students learn how to traverse interpersonal relationships” (p. 2). Group work has great potential to connect students and instructors socially.

During this research, e-learners were encouraged to use: an online discussion space, called the “lunch room”, forums to solve the video lesson challenges and, Facebook as their primary means for asynchronous communication.
Summary

Studies show that students value learning communities that provide social interaction; and that students want a supportive environment that recognizes the diversity of the individual and their cognitive contributions (Ley & Gannon-Cook, 2014). Designing online courses that provide opportunities for, instructor-to-student and peer-to-peer, interaction and affective engagement are important to the students. Research indicates that to improve e-learners’ performance and satisfaction, the design of online courses must effectively address the tasks assigned within the course and the interactive social support throughout the course (Kahai et al., 2013). Attributes of transformational leaders have been shown to instill, among other things, pride, gain trust and assist in the visualization of goals (Pounder, 2006). Existing research argues that Computer Supported Collaborative Learning (CSCL) facilitators can improve the quality of e-learning and increase the level of enjoyment when transformational leadership behaviors are implemented into e-courses (Kahai et al., 2013). Research indicates that it is important to provide transformational leadership for e-learners and that the implementation of interactive synchronous and asynchronous activities may be used to effectively increase e-learners’ satisfaction.
Chapter Three: Procedures and Methods

Research Design

This action research study used qualitative and quantitative data collection methods to explore the relationship between the use of the multimodal supports in online lessons and the sense of community, level of social interaction, and emotional satisfaction of e-learners. Data from mini-surveys, a post-survey and the researcher’s journaling was used to gather qualitative and quantitative data. Triangulation of data from multiple instruments and perspectives was used to strengthen the validity of the results. The goal of the research was to determine which support modalities could be used to increase emotional satisfaction of e-learners.

Using the principles of transformational leadership and a variety of modalities to improve social interaction, the researcher designed five online lessons for the Electrical Program at Vancouver Island University (VIU). In September 2015, the researcher met with her class to explain the research study to the students. She read a recruitment script to the students and provided the students with a copy of a student consent letter. See Appendix A: Recruitment Script and Appendix B: Student Consent.

During October 2015, 18 students participated in a blended online intervention consisting of five lessons. Each 90 minute online lesson had multimodal supports and taught a component of electrical math for Direct Current (DC) circuitry. Introductions/check-ins, video lesson challenges, virtual office visits, virtual classroom lectures and Facebook were the multimodal supports that the researcher used to provide socially interactive communication opportunities in the online sessions.

To measure the relationship between the multimodalities used in the lessons and the e-learners’ sense of community and level of social interaction, participants were asked to anonymously complete an online mini-survey after each lesson. Responses from the mini-
surveys provided data to promote evidence which informed the researcher’s practice and, when consent had been given by the student, the mini-survey data was also used as part of the current action research study.

After the online intervention was complete, an online post-survey was conducted to capture the students’ perception of the modalities used in the online lessons and was triangulated with the data from mini-surveys. The rich, descriptive data collected from the mini and post-surveys and the researcher’s journaling were coded to identify the emerging themes and the Likert scale questions were analyzed as quantitative data. Table 3.1 below, summarizes how each data collection instrument and communication modality was used in the research.

Table 3.1

*Use of the Modalities and Instruments*

<table>
<thead>
<tr>
<th>Online Lessons</th>
<th>Communication Modalities</th>
<th>Collection Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Virtual Introduction</td>
<td>Video Lesson Challenge</td>
</tr>
<tr>
<td></td>
<td>/ Check-ins</td>
<td>Virtual Office Meeting</td>
</tr>
<tr>
<td>1. Series Circuits</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>2. Parallel Circuits</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>3. Combo # 1</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>4. Combo # 2</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>5. Combo # 3</td>
<td>YES</td>
<td>YES</td>
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</tbody>
</table>

**Description of the Sample and Context**

The research project took place during the fall of 2015, at Vancouver Island University (VIU), in British Columbia, Canada. VIU is a categorized as a special purpose teaching university because it offers a variety of Apprenticeship, Bachelor Degree, and Master Degree programs. The VIU Faculty of Trades provides apprenticeship training for ten Red Seal trades
including the Electrical Apprenticeship Program. The Electrical Technical Training Facility offers electrical training for all four apprenticeship levels and the Electrical Foundation Program. There are three to four Electrical Foundations courses offered per fiscal year and each foundation course is six months long and has a designated instructor.

Electrical Foundation training is primarily taught using a face to face environment and each foundation class is made up of a mixed gender class of 18 students. The intervention implemented in the current study included five online lessons designed using five modalities to promote social interaction and to build community for e-learners. The online lessons followed a flipped classroom format and introduced mandatory curriculum. Each online lesson was designed to take approximately 90 minutes and was completed by the participants at a location of their choice. Each 90 minute lesson included an introduction or check-in and a video lesson challenge. During the third and fourth lessons, the students met with their instructor, in the virtual office, to discuss the students’ progress and concerns. During the final online lesson the students met with the instructor in a virtual classroom to complete the video lesson challenge.

For each online lesson, the e-learners were asked to post an introduction, or a check-in, in the virtual lunch room. These posts were designed such that the e-learners would need to use various media to introduce/check-in and share information about their selves. The introduction/check-in questions were designed by the researcher to promote social interaction and build a sense of community. For the first lesson, e-learners were asked to tell the rest of the class about someone whom they respected and how this affected the way that they approached their own learning. For the second lesson, e-learners checked-in by posting and telling a story about something interesting in their lives. For the third check-in, e-learners produced and posted a video about their hobbies. For the fourth check-in, e-learners used Facebook or the D2L virtual
lunch room to connect with three students to find out if those students had connections in the electrical industry. For the fifth and last check-in, students accessed the virtual classroom and introduced themselves using the audio and video tools in Blackboard Collaborate.

In addition to the introduction/check-ins, the e-learners completed a video lesson challenge in each online lesson. For the video lesson challenge, a computer program randomly put the e-learners into groups of three. The researcher posted videos in D2L and then instructed the e-learners to watch the video for that lesson. The e-learners then worked with their groups, online, to find solutions to a number of questions posed by the researcher. To facilitate social interaction, each person in the group was expected to complete some online research and contribute by posting to a discussion forum. For each video lesson challenge, one person was singled out to report back to the remaining groups. To select the individual that would report back for each video lesson challenge and to promote a sense of community, groups were given questions such as: which student had the most pets, which student had the smallest shoe size and which student had the most siblings.

The e-learners were invited to meet with their instructor in a virtual office during their third or fourth online lesson. The researcher designed the virtual office visit with an aim to provide opportunities to deepen the instructor-to-student relationship. The questions used during the virtual office meeting were chosen to offer feedback and coaching. Kind and helpful feedback was given with an aim to gain trust and address individual concerns. Discussions were initiated to encourage the student to think about their long term goals.

During the fifth online lesson, e-learners met in a virtual classroom. For this lesson, the check-in was a synchronous activity. Following the check-in, the computer randomly put the e-learners into groups of six. The instructor moved the groups to breakout rooms within the
Blackboard Collaborate platform. E-learners were asked to preview a specific video and then solve a video lesson challenge within Blackboard Collaborate.

Students from the Electrical Foundation courses participated in the online lessons. All of the students were expected to achieve the same learning outcomes and the online component occurred concurrently with blended classroom activities, for the five lessons. Eighteen students from the researcher’s class were invited to participate in the research. The convenience sample ranged from 17 to over 36 years of age and was from varied ethnic backgrounds. Electrical apprenticeship is a traditional trade and 88.8% of the participants were male. Before data was collected, the research method and purpose was described to the participants.

Description of Instruments Used

The researcher used an online mini-survey and post-survey as her instruments. She also observed the rates of participation in each online lesson and the depth and breadth of the online conversations and recorded her observations in her journal after each lesson. Data were compared for triangulation. The on-line surveys were adapted from Rovai’s (2002) Classroom Community Scale and Roblyer and Wiencke’s (2003) Rubric for Assessing Interactive Qualities in Distance Courses. Questions from Rovai’s (2002) Classroom Community Scale were selected and adapted because they specifically targeted stimulation of classroom community and communication. Roblyer and Wiencke’s (2003) Rubric for Assessing Interactive Qualities in Distance Courses was used to target and assess levels of interaction between the student and instructor and peer-to-peer. Using the D2L software, the surveys were completed anonymously online and the responses were only used in this research if the participant answered yes to the first question of the survey which was: By checking YES to this question you are indicating that you consent for your survey information to be used as data for the study entitled “Transformational Leadership, Communication Modalities and E-Learner Satisfaction”.

The questions for the mini-survey were adapted from Rovai’s (2002) Classroom Community Scale and Roblyer and Wiencke’s (2003) Rubric for Assessing Interactive Qualities in Distance Courses. The mixed method online mini-survey consisted of 11 questions ten Likert scale questions and one open ended question. After each lesson, the mini-survey asked Likert scale questions about how helpful each modality was and how it contributed to the participants’ sense of community and level of interaction. Questions 1-2 explored the effect of video introductions/check-in. Questions 3-4 explored the effect of the video lesson challenges. Questions 5-6 explored the effect of a virtual office meeting. Questions 7-8 explored the effect of a virtual classroom activity. Questions 9-10 explored the effect of chat, messenger and forum in Facebook. The open ended question allowed participants to share rich data specific to their experiences. See Appendix C: Online Mini-Survey Instrument.

The researcher developed the online post-survey to gather more in depth data than she could gather on a weekly basis. This would also improve the validity of the research through triangulation and allow rich descriptions to emerge. The questions for the post-survey were also adapted from Rovai’s (2002) Classroom Community Scale and Roblyer and Wiencke’s (2003) Rubric for Assessing Interactive Qualities in Distance Courses. The post-survey utilized 20 Likert scale questions, seven open ended questions and four demographic questions to assess the learners’ perspective on the effectiveness of various online support modalities and their impact on e-learners’ social interaction and sense of community. Questions 1-10 compared how the modalities affected the sense of community of the e-learner. Questions 11-20 compared how the modalities affected the level of interaction of the e-learner. Questions 21-27 were opened ended and asked the participant to outline their perception of the pros and cons of each modality.
Questions 28-31 collected demographic data. The online post-survey was conducted after the completion of the blended online intervention. See Appendix D: Online Post-survey Instrument.

**Procedures Followed**

The Vancouver Island University Ethics Board granted approval in June, 2015. Permission to conduct the research was granted by VIU Dean of Trades and Technology and Chair of the Electrical Program in September of 2015.

In September of 2015, students were invited to participate in the research. To ensure free and willing consent of the participants, the researcher clearly explained to the participants, their right to refuse and reviewed the potential risks before handing out the student consent letter explaining the research. To improve the reliability of the research, the researcher outlined the research to the students, in their classroom at VIU. The purpose was to inform students about the study, help them to understand the reasoning behind the research and seek their consent to include their survey responses as data. A written script, to recruit the participants, was read to the students. See *Appendix A: Recruitment Script*. It was clearly stated that participation in the research was completely voluntary and independent of their grades. The researcher also informed the students that, should they decide to participate, the results of the research would maintain their anonymity.

The researcher then explained the procedures to participate in the online mini- and post-surveys. It was clearly stated that all of the online surveys were an anonymous activity and assurance was given to the participants. The researcher gave each student a copy of the student consent letter. See *Appendix B: Student Consent*.

During October 2015, 18 students participated in five online learning lessons. The online lessons were provided through Desire to Learn (D2L), VIU’s closed online learning platform. The online lessons taught electrical circuitry concepts and incorporated the five modalities of
support: Introductions/check in, video lesson challenges, a virtual office visit, a virtual classroom session and Facebook. At the end of each online lesson participants completed an 11 question online mini-survey. The intent of the mini-survey was to identify which modalities in the online lessons contributed to the participants’ sense of community and their degree of social interaction. During each online lesson, the researcher read the introductions/check-ins and discussions used journaling to record her observations. The researcher took particular care not to include quotes that could identify specific individuals. Once participants had completed the five online lessons they were given an opportunity to complete the online post-survey. This took place in October, 2015. The responses were only used in this research if the participant answered yes to the first question of the survey which was: By checking YES to this question you are indicating that you consent for your survey information to be used as data for the study entitled “Transformational Leadership, Communication Modalities and E-Learner Satisfaction”.

Data from the surveys were analyzed, and the quantitative and qualitative data were triangulated with data from the researcher’s journaling. Data were coded and themes were used to understand the impact, that the support modalities, had on the e-learners’ sense of community and level of social interaction.

Validity

Validity was strengthened by the use of more than one instrument for data collection. The data from the mini-surveys, post-survey and the researcher’s journaling enabled the researcher to triangulate the results. The research was also strengthened because data was collected throughout the course using min-surveys after each lesson and the post-survey at the end and in addition to the Likert scale questions; rich and descriptive data was also collected from open ended questions in the online surveys and from journaling.
The researcher also strengthened the validity of the online survey questions by choosing and adapting questions from two external instruments. Rovai’s (2002) Classroom Community Scale and Roblyer and Wiencke’s (2003) Rubric for Assessing Interactive Qualities in Distance Courses are instruments that have the advantage of being tested previously in various studies. A challenge to the validity of the online survey was participant subjectivity when answering Likert scale questions.

Maintaining the continuity of environment strengthened the internal validity of this research. Each online session followed the same format and was used all five lessons. A limitation to the validity of this research was that the students primarily used a face-to-face learning environment and they may have had a preference for face-to-face lessons or they may have been uncomfortable with the online lessons. Students also meet in a classroom and have the opportunity to build community in a face-to-face environment and this may have affected their online survey answers regarding sense of community.

The sample and length of study had an effect on the validity of the research. The convenience sample size of 18 students was relatively small. The advantage of working with a small sample group was that it resulted in better use of the researcher’s time and increased opportunities to accurately reflect and journal. The range in participants’ age and experience strengthened the validity of this research because the mix of younger and older participants resulted in a broad variety of perspectives. The length of the study, which was approximately four weeks, could be viewed as limiting or advantageous. The researcher felt the short duration restricted outside influence on the results.

The personality and teaching style of the instructor was also considered. The researcher recognized that the internal validity of the study could be affected since the only class
participating was taught by the researcher. The researcher recognized that different instructors would utilize different transformational leadership skills and that the researcher’s teaching style would have an effect on the results. The nature of the study requires a very participatory instructor to enhance the students’ experience through transformational leadership traits.

Externally, it would be difficult to generalize these results outside of our Electrical Program; however the research has added valuable substance to our online lessons for this researcher and other instructors in the program. Data was also shared with the VIU Education Department and the D2LTeaching and Learning Centre to contribute to evidence informed practice.

**Analysis Techniques**

This mixed method research used the 11 question online mini-surveys, the 31 question online post-survey and the researcher’s journaling, as methods to collect data. Data was collected specifically from each lesson and after the intervention had ended. Quantitative data was gathered using Likert scale type questions in the mini- and post-surveys. Qualitative data was collected from responses to the open ended questions in the mini- and post-surveys and from the researcher’s journal notes. The quantitative and qualitative data were analyzed and the results were compared to provide insight into the effect that the specific modalities had on the participants’ sense of community and level of interaction. Data from all three collection methods were triangulated to validate the research results and contribute to the researcher’s informed practice.

Quantitative data was collected using the ten Likert scale questions from the mini-survey and the 20 Likert scale questions from the post-survey. The outcomes from the mini-surveys and the post-survey were divided into the following two subgroups: Sense of community and degree
of social interaction. Each subgroup measured the effect of the five modalities on the e-learner. The potential Likert scale responses used in online survey questions were: *strongly disagree, disagree, neutral, agree and strongly agree*. Quantitative data collected for each modality had a maximum possible score of five and a minimum score of one. Data was analyzed to assess the effectiveness of each modality. Scores, for each modality, were averaged and the mean was plotted in Excel graphs to summarize the impact of each modality on the sense of community and degree of social interaction. Higher scores indicated positive responses to the multimodality interventions. See Figures 4.1 through 4.4.

Results from the open ended mini-survey, post-survey questions and the researcher’s journal notes provided qualitative data that was coded to identify emerging themes. Using the frequency of responses, the researcher identified the themes that related to the impact of multimodality support on the participants’ sense of community and level of interaction. The researcher identified four favorable themes and four unfavorable themes related to the use of multimodal communication activities in online courses.
Chapter Four: Findings and Results

The purpose of this study was to acknowledge the needs and expectations of e-learners and to learn how transformational leadership characteristics could be used in the design of online courses to reduce the level of anxiety and frustration for e-learners. This action research used mixed method observations to explore the relationship between the use of the multimodal supports in online lessons and the sense of community, level of social interaction, and emotional satisfaction of e-learners. Transformational leadership principles were used by the instructor, in conjunction with five modalities, to stimulate a sense of community and social interaction. The modalities, that were being measured, were: check-ins/ introductions, video lesson challenges, virtual office visits, virtual classroom and Facebook. Introductions/check-ins, video lesson challenges and Facebook occurred in each of the five online lessons. The virtual office visit took place during the third and fourth online lessons and the virtual classroom was used during the fifth online lesson.

Participants of this study were students in the Electrical Foundation class taught by the researcher. The class was predominately male and had 18 students ranging from 17 to over 36 years of age. For this study, the researcher designed and used five online lessons, to cover the VIU curriculum for series, parallel and combination circuitry.

Mini-surveys, a post-survey and journaling were used to gather quantitative and qualitative data. Triangulation of data from multiple instruments and perspectives was used to strengthen the validity of the results. The goal of the research was to determine which support modalities could be used to increase e-learners’ sense of community, level of interaction, and emotional satisfaction.

The five mini-surveys asked the same 11 questions (after each online lesson) and consisted of 10 Likert scale questions and one open ended question. The 31 question post-survey
included 20 Likert scale questions, seven open ended questions and four demographic questions. Out of a total of 108 mini-surveys, 76 mini-surveys were completed (70.4%) and the post-survey return rates were very good with 16 surveys completed (88.8%) out of a total of the 18. Scores and themes gathered from the researcher’s class are presented as data in this chapter.

**Quantitative Data**

The following data was compiled from the researcher’s class of 18 students. See *Appendix E: Mini-and Post-Survey Quantitative Results*. This class was comprised of 16 male and two female students. The post-survey demographic results indicated that of the 16 students who agreed to allow their survey results to be used in this study, there were 14 students under the age of 23 years and two students above the age of 36 years. Question two of the demographic survey asked students if they had ever taken online courses in the past and whether any of the courses were blended format. Eleven of fifteen respondents for this question reported that they had previously participated in online courses, and of these four students indicated that they did not enjoy the online courses because they preferred to have access to a teacher when they wanted to ask questions. For example:

- **S3**: I took psychology 12 online and it was strictly an online course, the only issue that I had with that was physically there was no teacher in the class to show you how to solve any worksheets or to answer your questions, you had to figure out the answers and any questions that you had online on your own.

- **S6**: One and no it was a complete online piece, I liked that partially in class part for the help part.

- **S2**: I’ve taken one other online course, it was strictly online, which I found challenging. I would have rather have had a mix between or solely in the class.
Of the sixteen student responses, from the post-survey, regarding the preference to working in groups or working alone, results indicated that 69% of respondents preferred learning in groups while 31% preferred working on their own. Fifteen students responded when asked how they learned best. Of these, 53% indicated that they preferred learning by physically doing a task, 33.3% preferred visual learning and the other 13.5% were evenly split between preferring aural and verbal learning.

Likert style questions were used in the surveys to measure the effect that each modality had on the students’ sense of community and the level of interaction. Questions from both the mini-surveys and the post-survey were scored on a scale of one through five with strongly disagree equalling one and strongly agree scoring a five. In the mini-surveys, two Likert scale questions were used to measure each modality; one question asked about the modality and its relationship to the e-learner’s sense of community and the second question asked about the modality and its relationship to the e-learner’s level of interaction. In the post-survey, four Likert scale questions were asked about each modality; two questions asked about the modality and its relationship to the e-learner’s sense of community and two questions asked about the modality and its relationship to the e-learner’s level of interaction.

Averages were calculated for each question and the means are listed in Appendix E: Mini- and Post-Survey Quantitative Results. See Appendix E, Tables E 1.1 through E 1.5. The relationships between the modalities that were used in this research and the sense of community and level of interaction of the e-learners collected from the quantitative data from the mini-surveys and the post-survey are graphed in Figures 4.1 - 4.4.

Figure 4.1 displays results from the mini- and post-surveys. It graphs the relationship between each modality and the effect that the modality had on e-learners’ sense of community.
The virtual office modality scored the highest for sense of community in the mini-surveys with a mean of 3.8. The check-ins/introductions scored the highest results for sense of community in the post-survey with a mean of 3.7. The mini-surveys and the post-survey produced similar results, for each modality for measurements about e-learners’ sense of community, with the exception of the virtual classroom modality where there was a .937 spread.

*Figure 4.2* displays the results from the mini- and post-surveys. It graphs the relationship between each modality and the effect that it had on e-learners’ level of interaction. E-learners scored the virtual classroom modality as promoting the highest level of interaction in the mini-surveys with a mean of 3.5. The virtual office modality scored the highest level of interaction in the post-survey with a mean of 3.9. When each modality was measured against e-learners’ level of interaction, the responses from questions in the mini-surveys and the post-survey were very similar. The largest spread in responses, between the mini and post-survey results, was .677 for the virtual office modality.

*Figure 4.3 Sense of Community versus Level of Interaction*, displays the combined results of the mini- and post-surveys. It compares the effect that each modality had on e-learners’ sense of community against the effect that each modality had on e-learners’ level of interaction. In other words, *Figure 4.3* displays which modalities promoted e-learners’ sense of community and which modalities promoted e-learners’ level of interaction. The virtual office visit had the highest effect on the e-learners for both sense of community and level of interaction with an overall mean of 3.6. Check-ins/introductions were second with 3.5, then the virtual classroom at 3.4, video lesson challenges at 3.4 and Facebook at 3.3. The video lesson challenge and the virtual classroom had higher means for level of interaction, while Facebook scored higher for sense of community.
Figure 4.4 Video Lesson Challenge Trend, displays a trend that is presented in Appendix E. See Table E 1.1 Mini- and Post-Survey Quantitative Results, Table E 1.2. Video Lesson Challenge and Sense of Community versus Level of Interaction. The researcher identified a trend that indicates that the sense of community and level of interaction for e-learners increased with the number of opportunities that they were given to participate in the video lesson challenge group activity. Table E 1.5 Facebook versus Sense of Community and Level of Interaction also suggests that a similar but weaker trend is evident for Facebook participation.
Figure 4.1. Sense of Community versus Modalities
Figure 4.2. Level of Interaction versus Modalities
Figure 4.3 Sense of Community versus Level of Interaction
Figure 4.4. Video Lesson Challenge Trend
Qualitative Data

The researcher coded the results from the open ended question in the mini-surveys, the post-survey and her journaling to identify emerging themes. Using the frequency of responses, the researcher identified the themes that related to the impact of multimodality support on the participants’ sense of community and level of interaction. The researcher identified four favorable themes and four unfavorable themes related to the use of multimodal communication activities in online courses. Favorable themes that emerged, with regards to the participants’ sense of community, were *enjoyment and connections*. Favorable themes that emerged, with regards to the participants’ level of interaction, were *communication and collaboration*. The four unfavorable themes that emerged were: *discomfort, time, technology and disconnection*. One additional theme that emerged related to the video lessons was: *convenience*. Appendix F: *Mini-Survey Open Ended Question Summary* and G: *Post-Survey Open Ended Question Summary*.

Results from the open ended questions (mini-survey question (#11) and post-survey questions (#21 through #27)), and the researcher’s journal notes, are reported in the following paragraphs. Question number 11, in the mini-survey, was answered after each lesson and questions 21 to 27 in the post-survey, were answered once when the students had completed all five lessons. The researcher collected 5 to 10 journal posts, per lesson, from her observations in class, during the virtual office interviews and from the online discussion posts.

In Question 11, of the mini-survey, the e-learners were asked to describe which components, of the online lessons, contributed to their sense of community and to their level of interaction. E-learner responses identified the pro and con themes which were coded as favorable and unfavorable. The tables in *Appendix F* summarize the pros and cons reported in the mini-surveys for Question 11. See *Table F1.1 Pros for each Modality-Mini-Survey-Question 11* and *Table F1.2 Cons for each Modality-Mini-Survey-Question 1*. 
The researcher compiled the responses to Question 11 in the five mini-surveys, and noted that she had received 60 responses out of a total of 90. 63% of the responses mentioned specific modalities that contributed to the students’ sense of community while only 36.6% mentioned modalities that contributed towards the students’ level of interaction. 26.6% of student responses indicated that their participation in the introductions/check-ins contributed favourably to their sense of community. Video lesson challenges stimulated both sense of community and level of interaction, for the participants, equally scoring 10% apiece. No comments were returned from Question 11, of the mini-survey, regarding the virtual office visit. The use of a virtual classroom stimulated a greater level of interaction scoring 16.6% versus stimulation of their sense of community which scored only 1%. Facebook was mentioned in a favorable way, in 13.3% of the comments, as contributing to the students’ sense of community.

After completion of all five of the online lessons, e-learners were given the post-survey. The researcher designed the seven open ended questions, in the post-survey, to provide e-learners with an opportunity to identify the favorable and unfavorable effects that the communication modalities had, on their sense of community and level of interaction and satisfaction. Question 21, asked the e-learners to describe the effect that the opportunities to interact with their peers and instructor had on their level of satisfaction. Questions 22 through 26 asked the e-learners to share the pros and cons that they had regarding each modality and Question 27 asked the e-learners to suggest ways to improve satisfaction for online learners. The tables in Appendix G summarize the pros and cons reported in the seven open ended questions from the post-survey. See Table G1.1 Post-Survey Pros Summary and Table G1.2 Post-Survey Cons Summary.
Observations and journaling notes were also examined to identify effect of the use of modalities on the participants’ sense of community and their level of interaction. The pros and cons identified in the journal entries are summarized in Appendix H. See Table H1.1 Journaling Pro Summary and H1.2 Journaling Con Summary.

All of the responses from the mini-surveys, post-surveys and journaling were coded for the favorable and unfavorable themes. The researcher identified the common unfavorable and favorable themes that emerged for the five modalities: introductions/check-ins, the video lesson challenges, the virtual office visit, the virtual classroom and Facebook. The researcher identified four favorable themes and four unfavorable themes related to the use of multimodal communication activities in online courses. Enjoyment, connections, communication and collaboration were all identified as favorable themes. Discomfort, time, technology and disconnection were the four unfavorable themes that emerged. One additional theme that emerged related to the video lessons was convenience.

Specifically the favorable themes that emerged, regarding the participants’ sense of community, were enjoyment and connections and the favorable themes that emerged, with regards to the participants’ level of interaction, were communication and collaboration. In Appendices F, G and H, the researcher summarized the favorable and unfavorable themes for each modality and has provided the following quotes to support the summary.

**Introductions/check-ins.** The participants were asked to introduce themselves in the first online lesson and check-in at the beginning of the other four online lessons. Students reported that they enjoyed participating in the introductions/check-ins and that the activity increased their comfort level with the class. A couple of the students indicated that completing the introduction/check-in online was easier in person than in the classroom. The researcher’s journal
notes reported that in-class interaction increased significantly after a few of the online lessons were completed. These quotes provide evidence for the enjoyment theme.

S4: Check-ins help me get over a lot of shyness, it's out of my comfort zone but helps me get to know people.

S7: Allowed everyone to be more personable and comfortable.

S6: Regular check-ins are great fun.

S8: It really gets us warmed up and started for the lessons.

S9: Check-ins are good online, never good in front of the class.

S10: I liked posting photos and seeing the other photos.

A common response was connections. E-learners reported that the introduction/check-in activity gave them a chance to build community by connecting with their peers and providing opportunities to get to know others. For example:

S1: Sharing videos about our hobbies was such an interesting way to communicate but provided a solid sense of community with my classmates.

S3: Gives me a chance to learn more about people.

S5: Good understanding of who people are.

S14: Pretty interesting and helps me to get to know people better.

S11: Check-ins helped boost the comfort level.

Another common response was the ease of communication. E-learners reported that the introductions/check-ins were a good way to communicate. For example:

S10: It's a super easy way to communicate when you are not in the classroom.

S8: Allowed me to voice my opinion and to listen to others.
The e-learners also indicated that the introductions/check-ins opened up opportunities to collaborate. For example:

S11: I was more satisfied because I had more chances to collaborate.

S2: Gave us a chance to talk about networks and maybe even grow our own network through theirs.

S5: Allowed quite a bit of collaboration with my peers collaborating on the lesson.

S8: I could speak without worrying.

Discomfort, disconnection and time were unfavorable themes identified for introductions/check-ins. Some students commented that they were uncomfortable sharing personal information with the rest of the class. The researcher observed and recorded in her journal, that although most students completed the regular check-ins, there were a number of students who did not complete the check-in when it involved posting a video of them speaking about their hobbies. This was offset slightly in that one student commented that he liked the video check-in after he had completed the task. For example:

S12: Check-ins are invasive, I do not want to share my life with the class.

S13: Hardest part is the photos and video.

S1: I didn’t like posting a video of myself online.

S2: I liked the video check-in after the fact.

Other responses from e-learners indicated that the online check-ins didn’t connect the students as much as the classroom check-ins did.

S3: Interacting online felt less meaningful.
From the video check-in, the researcher noted that some students were very busy juggling family and personal commitments with school and this concurred with one student who did not like doing the check-ins because they took time away from homework.

S4: Frustrated when it takes time away from homework.

**Video lesson challenges.** The video lesson challenges were a group activity that occurred in each online lesson. The challenge involved assessing a you-tube video or completing internet research and then connecting with your group to answer a number of questions about the challenge. The groups were randomly chosen by the computer to increase the opportunity for students to work with someone new. The intent of the video lesson challenge was to encourage students to interact and get to know each other. The researcher also noted, in her journal, that in her face-to-face classes, group collaboration increased throughout and after the intervention. For the video lesson challenges, a favorable theme that emerged was collaboration and students reported that this activity increased their sense of community. For example:

S8: Even though we didn't know the answer, we worked together and tried.

S7: Doing the challenge with my group gives me a sense of community.

The researcher had also designed and produced separate instructional videos using a web camera; bamboo tablet and screen capture software. The researcher’s journal notes indicate that some of the student responses indicated that these instructional videos were very convenient. For example:

S3: A huge pro was being able to pause and rewind the videos to catch what I missed.

S5: Easy to make good use of my time.

S6: The videos were easily accessible anytime.
The most common unfavorable themes that emerged were time and disconnection. E-learners were given some time during regular class hours to complete the video lesson challenge; however the challenge required additional research by each student and this caused students to post at different times in the evening. The researcher recorded in her journal that some students posted after 11:00 pm which did not allow the rest of the group to respond before it was due in the morning. The researcher also noted that one student did not begin the lesson until after 1:00 am in the morning and that this student did not make it to class that day. Most students were frustrated because it was difficult to get responses from the other team members in a timely manner. For example:

S4: I am frustrated with delayed responses to questions within Facebook and D2L.
S11: Groups are driving me nuts, waiting around for peers to post.
S2: It takes too long when you are waiting for other students to get online to give you an answer.
S11: Feels like I am in a vacated chat room with spacey posts.
S8: Often need more than a day to respond

E-learners also reported that challenges occurred when trying to get together with their team. Most groups were set up with two or three students in the group and the researcher noted that this generated a limited number of posts. One student suggested an increase in the number of people per group may improve the interaction of the group. The researcher’s journal notes reported that some individuals gave up and did not try to connect with the group and chose to post the final answer without the group consultation. This disconnection caused problems for the e-learners. For example:

S9: It was hard to connect because of everyone’s schedules.
S4: Awkward to connect.
S3: Texting would be more convenient than D2L.
S14: Great, but hard to constantly communicate
S5: Not really interactive maybe go with bigger groups.
S6: Feel like I am in a vacated chat room with spacey posts.
S7: It is difficult to interact online because people can just sit there and not say anything.

Students also reported a preference to watch the videos in the classroom so that there would be an opportunity to ask their instructor questions. Notes from the researcher’s journal relay that some students preferred to bring the video lesson challenge questions to class to seek help with the answers. These quotes indicate that the students felt disconnected from their instructor.

S4: Prefer to watch the videos in class and where it is easier to discuss things.
S5: I would prefer learning in the classroom and then use the videos for review or clarification.
S6: I couldn't ask a question immediately.
S7: Steep learning curve.

Virtual office. Blackboard Collaborate was used to set up the virtual office. Students were sent email invites the week before their meeting and given specific times to meet online for a 15 minute chat. The virtual office provided an opportunity for the instructor to meet online with each student for a one-on-one chat. The researcher used this time to let the student know how they were doing and to find out if the student needed help with anything. The researcher reported, in her journal, that students appeared relaxed when they called in from their home
computer. Some were in their recreation room eating a snack and others were in their bedroom; the researcher also observed that during one meeting a parent was also listening. The most common favorable themes that emerged for the virtual office were: connections and communication.

The researcher also used this opportunity to connect with each student in order to encourage and praise the student’s achievements in the course. Student comments indicated that they really appreciated this meeting.

S2: I liked the one-on-one.

S5: My instructor was available anytime and this made me feel privileged.

S3: The instructor is paying full attention to you.

The researcher’s journal notes indicate that this meeting provided a good opportunity to assist the individual students and to address their concerns. The responses indicate that the e-learners really appreciated the opportunity to communicate individually with their instructor. For example:

S1: It is good to have an idea of where you stand in the class and what to work on.

S4: This was a great way to get feedback from my instructor.

The most common unfavorable theme that emerged for the virtual office was discomfort. One student really didn’t like using any social media and a couple of other students indicated that they would have preferred to meet in person.

S10: I don't like Skype, Google Hangouts or Face Time.

S11: I would rather have met in person.
S 12: I feel face-to-face is better for this.

Some technical issues and preferences surfaced in the comments. The biggest challenge with using Blackboard Collaborate was the delay that occurred for some students because of a poor internet connection. This caused confusion during the conversation and frustration. The researcher recorded in her journal, that the students were initially confused by the time delay, but most of the students adjusted quickly and seemed more at ease. The researcher also noted that one student used Facetime for the virtual office meeting and that the same student was not able to participate in the virtual classroom activity later in the week because his internet connection was not fast enough. The following quotes support the unfavorable theme that there were problems with the use of the technology.

S 7: Easier to use Facetime.

S8: The connections were slow.

**Virtual classroom.** The virtual classroom was a synchronous opportunity for students to see and hear each other while completing the fifth video lesson challenge group activity. Blackboard Collaborate was used to facilitate this activity.

The favorable themes that emerged for the virtual classroom were: enjoyment, communication and collaboration. Student responses indicated that they enjoyed participating in an online classroom and connecting with their classmates. The researcher recorded in her journal that before the class began multiple students were drawing fun pictures on the virtual whiteboard and there was a lot of joking and laughing. The following quotes support the enjoyment theme.

S5: The online room felt like an actual classroom complete with shenanigans and order.
S6: The classroom was fun and good to help your team out.

S7: Blackboard was a great way for us to interact in an almost face-to-face environment.

S8: It allowed us to interact beyond just doing work.

Students also really enjoyed the opportunity to collaborate in an online environment.

Students were put into teams of six and moved to private breakout rooms. The researcher visited each of the rooms multiple times during the one hour activity. Notes from the researcher’s journal indicate that the students were working well in their groups and that the atmosphere was one of comradery. The collaboration theme is supported by the following quotes.

S9: It's a good way to communicate.

S10: It was a good way for everyone to interact together.

S5: It feels like you are on a level playing field.

S11: It's good that your ideas are thrown onto the page for everyone to see rather than being talked over or misheard.

S12: Talking to peers can sometimes be more effective than a teacher for learning.

S13: Online collaborate with a group of six was great and was easy to talk and share ideas.

S1: We worked as a group and everyone had a say.

S14: We interacted a lot because we could talk and see each other.

The most common unfavorable theme that emerged for the virtual classroom was disconnection. Some students indicated that not everyone had participated during the video lesson challenge and this effectively left some groups working as a smaller group. One student indicated that he wanted to participate to a greater extent than he did. Journal entries indicate that
the researcher had difficulty discerning whether everyone in the group was participating. The unfavorable theme of disconnection is supported by the following quotes.

S4:  It's more difficult to interact online because people can just sit there and not say anything.

S2:  I prefer face to face where there is more interaction.

S3:  I didn't interact as much as I would have liked, even though there were opportunities, this is likely due to my introversive nature.

Another theme that emerged for the virtual classroom, was that there were some challenges related to using online technology for the video lesson challenge group activity that frustrated the students. The researcher observed and recorded in her journal, that at the beginning of the lesson, some students waited to see if others were going to speak online and this caused some delay in the conversation. On other occasions, the researcher noted that students sometimes talked at the same time which caused confusion. These quotes provide examples of the problems that the e-learners had with technology during the virtual classroom session.

S13:  Little quirks with people trying to connect, hearing from everyone and learning to use the program.

S14:  It was hard to get a word in when multiple people were trying to voice their opinions.

S1:  Hard to interact because people would wait 2-3 seconds to talk.

Technology problems also prevented a couple of students from participating in the video lesson challenge because their internet connection was poor and kept dropping out. A few other students experienced a delay in the audio because of their connections. Journal notes report that one student’s connection was repeatedly dropped and that they returned multiple times.
S2: Some students can't afford computers and/or high speed internet.

**Facebook.** Favorable themes that emerged for Facebook were: connections, communication and collaboration. Student responses to the open ended questions about the use of Facebook indicated that Facebook was a really easy way to connect and that it contributed to their sense of community. One of the researcher’s journal entries reported that it took awhile before the majority of the class had asked to join the class Facebook group and that a couple of students never joined. The researcher enjoyed the opportunity to gain insight into the lives of her students and was able to understand some of their challenges more easily. The following quotes are examples of the ways in which e-learners were able to connect through the Facebook modality.

S2: Talking in Facebook contributed to my sense of community because I got to learn more about my peers.

S7: Allowed me to share memorable times in my life with my peers. Makes you feel more connected.

E-learner responses also indicated that Facebook was a useful way to improve communication between e-learners. For example:

S3: Easy to interact and a faster way to get feedback.

S4: Easiest way to communicate online.

S5: Easy way to share ideas or get questions answered.

One of the advantages that students noted about the use of Facebook was that the push notifications provided instant access. This relieved some of the frustration, related to delays in receiving responses that had occurred in other the other modalities. In her journal, the researcher noted that even though the push notifications came through to her phone, she still needed to
complete and extra step to sign into Facebook before she could see it. These quotes support the favorable theme: connection.

S7: Facebook gives push notifications and you can access it from your phone.
S8: It's better than communicating in D2L.
S9: Better push notifications, pushes to the phone not just email.

The unfavorable themes that emerged about the use of Facebook were: discomfort, time, technology and disconnection. Some students noted that they still found that the lack of an immediate response made communication more difficult. A journal entry reports that one student posted with what appeared to be a great idea and did not get any responses to his Facebook query. The unfavorable theme: disconnection, is clarified by these quotes.

S9: Difficulty with waiting for responses from others.
S10: I was only able to interact with a handful because most did not respond.
S11: Still difficult to get a hold of people sometimes, group text messaging would be faster.
Chapter 5: Summary, Discussion, Limitations and Recommendations

Summary

This study was initiated because the researcher questioned why she enjoyed face-to-face learning in a classroom and felt isolated, bored and frustrated in online courses. Fredricks, Blumenfeld and Paris (2004) argue that a key factor in engagement during learning is the emotional state of the student. The purpose of this study was to acknowledge the needs and expectations of e-learners and to learn how transformational leadership characteristics could be used in the design of online courses to reduce the level of anxiety and frustration for e-learners.

The requirement for socially interactive support is well documented and long standing. For example, Vygotsky’s (1978; 1986) research substantiates the concept that students will be more engaged and benefit from instructors that facilitate social interaction in online courses. The goal of this study was to identify socially interactive multimodal supports which would create a sense of community and a high degree of social interaction for e-learners, with an aim to increasing emotional satisfaction for electrical apprentices learning trades mathematics. The focus of this research was to explore the relationship between the modalities used in the online electrical foundation courses and the students’ sense of community and their level of interaction.

The research project took place during October and November of 2015, at Vancouver Island University (VIU), in British Columbia, Canada. An instructional intervention targeting the use of socially interactive multimodal support was designed. Five online lessons were developed for the research; and five modalities were used in the online lessons to provide opportunities for peer-to-peer and instructor-to-e-learner interaction. The five modalities were: introductions/check-ins, video lesson challenges, virtual office, virtual classroom and Facebook.
From a convenience sample of 18 students, 16 students participated. The majority of the participants were under the age of 23 and two were over 36 years of age.

The researcher hypothesized that, because of the effect of transformational leadership characteristics, the impact of incorporating interactive social support into the design of online courses would lead to a high level of satisfaction among e-learners. Data from online mini-surveys, a post-survey and the researcher’s journaling were used to gather qualitative and quantitative data. The results from the mini-surveys, the post-survey and the researcher’s journaling were coded and analyzed to examine the ways in which specific modalities contributed to students’ sense of community and level of interaction.

Quantitative and qualitative questions and the researcher’s journaling data were triangulated to strengthen the researcher’s conclusions. The quantitative data indicated that all five of the modalities increased the sense of community and level of interaction for e-learners; however the results indicated that each modality worked in different ways. For example the virtual office modality scored the highest for sense of community, while the virtual classroom scored the highest results for level of interaction, and the introductions/check-ins scored high for both sense of community and level of interaction. Responses from the open ended questions and the researcher’s journal notes indicate that the qualitative data supports quantitative results and that the modalities did promote e-learners’ sense of community and level of interaction.

Evidence from this action research suggest that effective use of interactive multimodal support increases e-learners’ sense of community and level of interaction. The researcher aligned the results of this action research with existing research, to further support the researcher’s hypothesis. Existing empirical research posits that an increase in the participants’ sense of community and level of interaction also increases the participants’ emotional satisfaction. For
example, findings by Kahai et al. (2013) indicate that CSCL facilitators can improve the quality of cognitive e-learning and increase the level of enjoyment when transformational leadership behaviours are implemented into e-courses. The interactive multimodal supports used in this action research were chosen because they provided opportunities to embed transformational leadership behaviours into the online courses. Quantitative and qualitative data gathered in this research indicated that the e-learners enjoyed the addition of socially interactive multimodal support in their online lessons. The researcher posited that providing multimodal supports increased the level of emotional satisfaction for some e-learners.

Fredricks, Blumenfled and Paris (2004) argue that when students have a positive feeling about their instructor and peers, their level of engagement increases and they feel better about school and learning and Cole and Kritzer (2009) advocate that having trustworthy and participatory instructors who have a strong, motivating social presence and who communicate effectively are key elements that e-learners identify as important to their success and satisfaction. Quantitative results from Question # 3 of the mini-survey (In this online lesson, the virtual office visit invitation made me feel like my instructor cared about me.) and the responses from the open ended question # 24 of the post-survey (Please share any pros and cons you have regarding the virtual office visit.) indicated that the e-learners really valued the feedback and individual support that they received from their instructor during the virtual office visit. The researcher concluded, from these results, that the e-learners may have been more emotionally satisfied because of the virtual office meeting that they had with their instructor.

**Discussion**

For this study, the researcher followed Salmon’s (2002) online teaching model because of the transformational leadership principles embedded into it. Salmon’s model embodies both the
transactional and the emotional elements necessary to build an effective online course. The researcher followed Salmon’s model (outlined below) and designed the interactive support modalities so that transformational teaching characteristics were incorporated.

Step 1: help the students get settled in the course by facilitating interaction, encouragement, warmth and technical assistance.

Step 2: facilitate opportunities for the students to connect socially within a social and cultural learning environment.

Step 3: facilitate and support student access and understanding of course materials and an interactive process to assist with knowledge construction.

Step 4: accommodate and provide encouragement in the achievement of each student’s personal goals.

Following Salmon’s online teaching model, the researcher used a combination of face-to-face discussion and online learning to get the students settled in the course and to introduce the D2L learning platform. The researcher also produced and posted a personalized introduction video to welcome and encourage the e-learners. After the students completed the first online lesson, the researcher observed and qualitative data confirmed that some students still had difficulty finding their way around the platform. Because of this, the researcher used additional face-to-face sessions to assist the participants with their understanding of the D2L platform.

In the second step, the researcher specifically designed the introductions/check-ins, video lesson challenges, the virtual classroom group exercise and the use of Facebook to promote interactive social connectedness between the students. Quantitative and qualitative results indicated that these modalities did contribute to the participants’ sense of community and level of interaction. For example: the introductions/check-ins scored a mean of 3.5 and promoted both
sense of community and level of interaction equally. Check-ins placed second overall, for sense of community and level of interaction, out of the five modalities that were tested. This seems to be because the participants enjoyed the opportunity to get to know others and to collaborate outside of the classroom. There were quite a few students who did not feel comfortable sharing personal information and were not comfortable posting a check-in using a video format.

The video lesson challenge quantitative scores indicated that the participants felt that this activity promoted peer-to-peer interaction to a greater extent than it contributed to their sense of community. Trending scores for both sense of community and level of interaction showed an increase in popularity with each opportunity that the participants had to participate in a video lesson challenge. In spite of this, the activity was frustrating to many students because they did not enjoy waiting for their team members to post to the online discussion. They indicated that conflicting schedules were the biggest challenge and that the use of bigger groups, implementing deadlines and the use of texting may have improved the facilitation of their group challenge.

The virtual classroom also scored highly over all in both sense of community and level of interaction. Quantitative data indicated that this activity promoted interaction and was enjoyable. However, qualitative responses and researcher observations confirmed that some students had difficulty with the online technology and that this detracted from their virtual classroom experience. About half of the students did not have internet connections that were fast enough and this caused delays in communication and a few participants experienced dropped connections. The Blackboard Collaborate platform also had video limitations that locked out the other participants and the instructor when it was exceeded. Facebook scored higher in sense of community than level of interaction. The researcher learned a lot about her students through this
process and was able to adjust her teaching style to meet the needs of each student more effectively.

Although Facebook did not score as high overall as the other modalities, it was showing increasing popularity as the students progressed through the lessons. This trend was also evident from the responses for the video lesson challenge. The researcher suspects that the impact from these two modalities would increase the e-learners’ sense of community and level of interaction, if they were used consistently.

The third element of Salmon’s model is facilitation and support for the student to access and understand course materials and provide an interactive process to assist with knowledge construction. To achieve this, the researcher designed and produced videos using a web camera, a bamboo tablet and Anastasia live screen capture. The videos were done with the instructor as the presenter who was demonstrating the correct process to solve math problems. E-learners were encouraged to use D2L, Facebook, email, texting and phone calls to ask questions. The researcher hoped that this would provide students with a more personal connection to the instructor. Qualitative data indicated that students really enjoyed the videos and appreciated the opportunity to watch them as often as needed. The most common response, about the videos, was that students could pause and rewind them. For example:

S 8: A huge pro was being able to pause and rewind the videos to catch what I had missed.

Step four in Salmon’s model is to accommodate and provide encouragement, in the achievement, of each student’s personal goals. To facilitate this, the researcher set up one-on-one, virtual office meetings between the instructor and the students. Data indicated that the students really appreciated the opportunity to connect with their instructor and this modality
scored highest overall, for both sense of community and level of interaction, with an overall mean of 3.6. However qualitative responses showed that a number of students would have preferred to meet face-to-face and a few students had difficulty with internet connections because the poor connections which interfered with the quality of the meeting and detracted from the participants’ experience. One participant, who had a poor internet connection, chose to connect with the researcher through Facetime.

For implementation of this model, the researcher chose modalities that would provide both synchronous and asynchronous opportunities for interaction. Jacobs (2013) asserts that because of the constant change in technology, creativity must be used by the instructor so that the e-learners have a variety of ways to use the computer to foster interaction with their peers and their instructor. Results of the qualitative responses from this study indicate that care must be taken when designing the online courses. In this research, students preferred synchronous activities because of the immediate feedback and they were frustrated by the delayed responses that occurred in the asynchronous formats.

To further the improvement of online learning and to increase the satisfaction of e-learners, the research question was: What impact will the use of multimodal supports in the design of online courses have on the sense of community, level of social interaction, and emotional satisfaction of e-learners in trades mathematics? This study investigated the relationship between specific multimodal supports and the students’ sense of community and level of interaction that students experienced in online courses.

The results of this study show that the virtual office visit returned the highest mean scores in both sense of community and level of interaction. The virtual office modality utilized in this study was chosen because the researcher anticipated that it would promote the connection
between the e-learner and their instructor which could lead to a more positive experience for the students. The researcher notes that the virtual office modality was designed to target the specific needs of e-learners. Key elements identified as important to a student’s success and satisfaction are having trustworthy and participatory instructors who have a strong, motivating social presence and who communicate effectively (Cole & Kritzer, 2009). The researcher also argues that the virtual office visit provides a terrific opportunity for the instructor to enact the principles of transformational leadership. The transformational leader instills pride, gains trust, assists in the visualization of goals and visions, promotes creative problem solving and provides coaching, mentoring, feedback and addresses individuals’ concerns (Pounder, 2006). Research indicates that designing online courses using the transformational leadership principle may be effective in addressing the needs of e-learners. Results from this action research indicate that e-learners really enjoyed the opportunity to meet one-on-one with their instructor and they valued the feedback and personalized attention. Used in this way, the virtual office visit provides a strong modality for the instructor to connect with their students and provide transformational support that is valued by the students. The researcher will definitely continue to utilize virtual office visits in her practice.

The results of this research indicate that the introduction/check-ins were valued second only to the virtual office modality. High quantitative scores for both sense of community and level of interaction indicate the usefulness of this modality. The most popular responses to the surveys were that the introduction/check-ins gave the e-learners a chance to get to know people and that it allowed for quite a bit of interaction and collaboration. The researcher designed this modality with an aim to increase the interactive support in e-learning because the researcher agrees with the argument posited by Kahai et al.(2013), in that success and satisfaction of the e-
learner is dependent on access to interactive social supports and that the type of social support e-learners receive during their course is very important. Lee et al. (2011) explained that their survey results revealed that online students want their experience to include support through social connections to their peers and to their instructor and that e-learners want to have opportunities to learn from their peers through peer teaching, tutoring and facilitation. The researcher is pleased with the positive results of this research regarding the value of using the introduction/check-in modality. The results of this research indicated that the introduction/check-in modality was a strong modality valued by the e-learners and the researcher intends to continue to use this modality to improve her practice.

Limitations

While results of this study did provide evidence that the use of the five modalities lead to a greater sense of community and level of interaction for the participants, there were some limitations that must be addressed. The purpose of this research was to explore the relationship between the use of interactive support modalities and the participants’ sense of community, level of interaction and emotional satisfaction. The results indicated that there was an increase in the sense of community and the level of interaction with these participants; however the research survey questions did not provide a method to directly correlate a connection between the increase in the sense of community, level of interaction and the emotional satisfaction of the participants. The researcher recommends changing the survey questions in order to provide opportunities for e-learners to comment on the effect that the various modalities had on their emotional satisfaction.

The duration of this study could be presented as a possible limitation. The five mini lessons were completed within a four week period. Data indicated that some students had never
completed an online course. One student responded that completing the online lessons were a steep learning curve. This may have contributed to the discomfort of some students. Quantitative data for the video lesson challenges and Facebook indicated that the participants’ sense of community and level of interaction improved with time. Because of the short time frame, participants only had one opportunity to meet in the virtual office visit and the virtual classroom during this trial. The researcher wondered how additional opportunities to experience these modalities may have altered the survey results.

Another possible limitation was the relatively small sample size used for this study. Data for this research was gathered from 16 participants enrolled in the researcher’s blended electrical foundation class. The class was mixed, however the majority of the students were male and under the age of 23. Also because the researcher was the instructor, for this class, the participants’ experiences and responses would have been different than for another instructor. Another limitation is that the small sample size may not reflect the greater population of all electrical foundation classes and the researcher recognizes that it would be difficult to generalize these results to other schools. Qualitative survey responses indicated that some the modalities would have been more effective if the course had been strictly online instead of a blended course.

This mixed method research, using triangulation of the mini-survey, post-survey and the researcher’s journaling, was effective; however there were limitations to the instruments. The researcher noted that some students were confused between the video lesson challenge and teaching videos that the researcher had produced. Although the researcher designed her survey instruments for this study by adapting it from previously published and validated instruments, the questions did not provide a method to correlate the sense of community and level of interaction
with the emotional satisfaction of the participant. This blended class also interacted face-to-face, in a traditional classroom and this may have contributed to the sense of community and level of interaction that occurred between the e-learners which may have skewed the survey results.

**Recommendations**

**Implications for practice.** The researcher has gained a number of insights through this action research study. She recognizes the value that the five modalities have added to her online lessons. However, because of the survey responses and her personal observations, she intends to make some changes to the design of the online course and her practice. Although the introduction/check-in activity was well received by most students, the researcher feels that introverted and shy students will need additional support to complete this exercise. Most students were comfortable with general posts; however they were uncomfortable posting video of themselves. In the future, the researcher will alter the introductions/check-ins to provide alternatives for e-learners who feel uncomfortable with posting a video of themselves. The video lesson challenges were frustrating for many students because of the delay in the responses from their group members. This group exercise would need to be redesigned to facilitate better communication between the group members. This activity could be improved by adding a timeline requiring responses to be entered by a specific time and it would also have been more interactive if each student was responsible for contributing to the discussion. The virtual office visit was well received, however some students did have connectivity challenges and in the future the researcher would alter the virtual office platform to include programs such as Facetime, Messenger or Skype. The virtual classroom, using the Blackboard Collaborate was successful, except that some students had challenges with technology. The researcher would go
through a more rigorous testing process to ensure that the e-learners had good internet service. Facebook was only somewhat successful, in that not all of the class joined the Facebook page.

The researcher was pleased with the overall success related to the use of the five modalities: introductions/check-ins, video lesson challenges, virtual office visit, virtual classroom and Facebook. The researcher gained a greater understanding of the needs of her students through the introductions/check-in activity and from the one-on-one virtual office visits. The video lesson challenges created a marked difference in the face-to-face interactions of her traditional classroom. The use of the virtual classroom resulted in new dynamics between e-learners and Facebook provides ongoing networking even after the class ends. Going forward, the researcher will continue to use these five modalities and would also like to add additional methods of asynchronous and synchronous interactive activities such as: Googledocs, Twitter, Instagram, Facetime and Skype. She feels that, used effectively, all methods of interactive social support can be extremely important.

**Further research.** The researcher used previous research data to link the increase in sense of community and level of interaction to the emotional satisfaction of the participants. The researcher cautions that this is not conclusive and that further research is needed. This research indicated that each modality promoted the participants’ sense of community and level of interaction, however for each modality there were students who indicated that there was a problem. For example: a few of the students indicated that they preferred to work alone and that for them participating in the introductions/check-ins was uncomfortable, a number of students were frustrated when waiting for responses during the video lesson challenge and that this affected their satisfaction, a couple of students indicated that the virtual office visit was hindered by slow internet connections, one student commented that although the virtual classroom was fun
and interactive, they did not feel that it was really productive, a few students did not use Facebook or other social media. Further research might explore the relationship between the five modalities used in this research and the level of students’ emotional satisfaction. The researcher suggests that a pre/post-test may have been helpful to determine the emotional satisfaction before and after the intervention.

The researcher chose five modalities to test in this research. Using the D2L online learning platform the modalities tested were: introductions/check-ins, video lesson challenge, virtual office visits and the virtual classroom. Facebook was chosen as an existing social media. Further research may include other modalities and means to communicate. A few participants commented that texting would be easier and less frustrating because of the instant push to the phone. The use of Blackboard Collaborate is only one of many platforms available and due to its video limitations and audio delays was frustrating for some participants. Technology is rapidly changing and further research may be useful to determine alternative modalities that students find easier to use and less frustrating.
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Appendix A: Recruitment Script

October, 2015

**Study Title:** Transformational leadership, Communication Modalities and E-Learner Satisfaction

*Hi, my name is Deanna Littlejohn.*

*In addition to being an instructor in this program, I am working to complete a Master’s Degree in Educational Leadership at Vancouver Island University. As part of the master’s program, I am involved in applied educational research which is designed to inform and improve my professional practice. For this research, I have designed a project to improve how I deliver support for online lessons. The goal of this research is to determine which communication methods result in effective support and can be used in online courses to increase e-learners’ satisfaction.*

*As students in our electrical program this semester, you will be completing five, electrical online lessons using the Desire to Learn (D2L) platform. Every student will be asked to fill out a mini-survey after each online lesson and a post-survey after all five lessons are completed. I expect the mini-surveys to take eight minutes and the post-survey to take 40 minutes. You will complete the surveys online and software will anonymize the results. From these survey results, I will be examining connections between the types of communication supports that were used in your online lessons and how this affected your level of satisfaction. To improve my day to day teaching practice, this data will be used to help me to determine how to design our future online lessons. For my research, I am seeking volunteers so that these results can also be used as data for my study on Transformational Leadership, Communication Modalities and E-Learners Satisfaction. My research will be presented in a written thesis to Vancouver Island University and will be available to the public through the VIU library website. It is hoped that this study will contribute to other instructors and researchers as they build on communication strategies to improve the level of satisfaction that students experience in online courses.*

*You are being asked to volunteer to be a participant in the study. The good news for you is that if you volunteer you don’t have to do anything extra, except give me permission to use your survey responses as data in my study. To give me permission, please check ‘YES’ to the Consent Question of each online survey where it asks for your consent to use your survey responses in my research on Transformational Leadership, Communication Modalities and E-Learner*
Satisfaction. Note that electronic software is used so that these surveys are automatically anonymized and once you submit a response; your data cannot be withdrawn and will be analyzed among the other study results. Data will only be reported collectively, so each individual’s responses will be anonymous and your names will not be used in the study.

There are no known harms associated with participating in this study. Being a participant, or not, will not affect your grade or my perception of you and I will not know if you agreed to participate. Please note that these survey results are designed to be anonymous; however there is a chance that I may recognize the writing style of some individuals.

Thank you and please feel free ask questions now or meet with me anytime.
Appendix B: Student Consent

October, 2015

Study Title: Transformational leadership, Communication Modalities and E-Learner Satisfaction

Deanna Littlejohn, 
Master of Educational Leadership: Student 
Vancouver Island University 
Deanna.littlejohn@viu.ca 
250-740-6563

Rachel Moll, PhD, 
Faculty of Education: Advisor 
Vancouver Island University 
Rachel.moll@viu.ca 
250-753-3245 – ext. 2161

Hi

You are being invited to participate in this study because you are a student in the Vancouver Island University Electrical Foundation Program. In addition to being an instructor in this program, I am a student at Vancouver Island University working to complete a Master’s Degree in Educational Leadership. As part of the master’s program, I am involved in applied educational research which is designed to inform and improve my professional practice. The goal of this research is to determine which communication methods result in effective support and can be used in online courses to increase e-learners’ satisfaction.

As students in our electrical program this semester, you will be completing five, electrical online lessons using the Desire to Learn (D2L) platform. Every student will be asked to fill out a mini-survey after each online lesson and a post-survey after all five lessons are completed. I expect the mini-surveys to take eight minutes and the post-survey to take 40 minutes. You will complete the surveys online and software will anonymize the results. From these survey results, I will be examining connections between the types of communication supports that were used in your online lessons and how this affected your level of satisfaction. To improve my day to day teaching practice, this data will be used to help me to determine how to design our future online lessons. For my research, I am seeking volunteers so that these results can also be used as data for my study on Transformational Leadership, Communication Modalities and E-Learners Satisfaction. My research will be presented in a written thesis to Vancouver Island University and will be available to the public through the VIU library website. It is hoped that this study will contribute to other instructors and researchers as they build on communication strategies to improve the level of satisfaction that students experience in online courses.
You are being asked to volunteer to be a participant in the study. The good news for you is that if you volunteer, you don’t have to do anything extra, except give me permission to use your survey responses as data in my study. To give me permission, please check ‘YES’ to the Consent Question of each online survey where it asks for your consent to use your survey responses in my research on Transformational Leadership, Communication Modalities and E-Learner Satisfaction. Note that electronic software is used so that these surveys are automatically anonymized and once you submit a response; your data cannot be withdrawn and will be analyzed among the other study results. Data will only be reported collectively, so each individual’s responses will be anonymous and your names will not be used in the study.

There are no known harms associated with participating in this study. Being a participant, or not, will not affect your grade or my perception of you and I will not know if you agreed to participate. Please note that these survey results are designed to be anonymous; however there is a chance that I may recognize the writing style of some individuals. Data will be stored on a password protected computer and the survey data collected using the Desire to Learn (D2L) platform is stored on a server in Canada.

If you have any questions or desire further information with respect to this study, you may contact me, Deanna Littlejohn, Vancouver Island University, at 250-740-6563. Email: Deanna.littlejohn@viu.ca, or my Supervisor, Dr. Rachel Moll, Faculty of Education, Vancouver Island University at 250-753-3245 x 2161, Email: rachel.moll@viu.ca

If you have any concerns about your treatment as a participant in this research, please contact the VIU Research Ethics Officer at reb@viu.ca or by telephone at 250-753-3245 (ext. 2665).

Your participation in this research study is entirely voluntary and you may refuse to participate in the study for any reason. However, if you have submitted your survey with the ‘YES’ box checked, indicating consent that your data can be used in the research, your responses are automatically anonymized and cannot be removed from the study results.

Please keep this form for your records and thank you for considering participating in my research.

Deanna Littlejohn
Appendix C: Online Mini-Survey Instrument

Thank you so much for taking the time to complete this survey😊. Please read each statement and choose the answer that comes closest to how you feel about each of the communication tools used in this online lesson. There are no correct or incorrect responses.

Electronic software is used so that this survey is completely anonymous and once you submit a response; the data cannot be withdrawn and will be analyzed among the other study results.

Consent Question: By checking ‘YES’ to this question you are indicating that you consent for your survey information to be used as data for the study entitled “Transformational Leadership, Communication Modalities and E-Learner Satisfaction”.

(Yes) (No)

**Sense of Community**

1. Participating in the **introduction/check-in** during this online lesson increased my comfort level with the other students in this course.
   
   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

2. Completing the **video lesson** challenge in this online lesson helped me to build relationships online.
   
   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

3. In this online lesson, the **virtual office visit** invitation made me feel like my instructor cared about me.
   
   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

4. The **virtual classroom** we used in this online lesson made it easier to form meaningful relationships among students in an online environment.
   
   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)
5. **Facebook** was a space where I could comfortably communicate with other students during this online lesson.

   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

**Level of Interaction**

6. The online **introduction/check-in** during this online lesson gave me great opportunities to learn from my peers.

   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

7. The **video lesson** challenge in this online lesson successfully encouraged me to interact with my peers.

   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

8. The **virtual office** is a good opportunity to discuss things with my instructor.

   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

9. Interaction with other students in the **virtual classroom** in this online lesson provided me with opportunities to exchange ideas with other students.

   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

10. When I communicated on **Facebook** during this online lesson, I enjoyed the opportunity to interact with my peers.

    (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

11. Please describe which components of this online lesson contributed to your sense of community and the amount that you interacted in these lessons? Why do you feel this way?

    ___________________________________________________________
    ___________________________________________________________
    ___________________________________________________________
    ___________________________________________________________
    ___________________________________________________________
    ___________________________________________________________
Appendix D: Online Post-survey Instrument

Thank you so much for taking the time to complete this survey😊. Please read each statement carefully and choose the answer that comes closest to how you feel about each of the communication tools that were used in the online lessons in this course. There are no correct or incorrect responses.

Electronic software is used so that this is survey completely anonymous and once you submit a response; the data cannot be withdrawn and will be analyzed among the other study results.

Consent Question: By checking ‘YES’ to this question you are indicating that you consent for your survey information to be used as data for the study entitled “Transformational Leadership, Communication Modalities and E-Learner Satisfaction”.

(Yes) (No)

Sense of Community

1. Participation in the online introductions/check-ins promoted a sense of community.
   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

2. Online introductions/check-ins promoted sharing and caring among students.
   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

3. The video lesson challenges helped me relate to my instructor.
   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

4. The video lesson challenges encouraged me to ask my peers for help.
   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)

5. Because of the virtual office visits, I felt like I was being supported by my instructor.
   (Strongly Disagree) (Disagree) (Neutral) (Agree) (Strongly Agree) (Not Applicable)
6. I felt more comfortable talking with my instructor because of the **virtual office visits**.

   (Strongly Disagree)  (Disagree)  (Neutral)  (Agree)  (Strongly Agree)  (Not Applicable)

7. The **virtual classroom** was a fun place to interact with the other students.

   (Strongly Disagree)  (Disagree)  (Neutral)  (Agree)  (Strongly Agree)  (Not Applicable)

8. Because of the dialogue, the **virtual classroom** made me feel closer to my classmates.

   (Strongly Disagree)  (Disagree)  (Neutral)  (Agree)  (Strongly Agree)  (Not Applicable)

9. The synchronous discussions (when I used chat) in **Facebook** helped me feel connected to my instructor and peers.

   (Strongly Disagree)  (Disagree)  (Neutral)  (Agree)  (Strongly Agree)  (Not Applicable)

10. I felt safe using **Facebook** for discussions.

    (Strongly Disagree)  (Disagree)  (Neutral)  (Agree)  (Strongly Agree)  (Not Applicable)

**Level of Interaction**

11. The online **introductions/check-ins** increased my interaction with the other students.

    (Strongly Disagree)  (Disagree)  (Neutral)  (Agree)  (Strongly Agree)  (Not Applicable)

12. The online **introductions/check-ins** increased my interaction with my instructor.

    (Strongly Disagree)  (Disagree)  (Neutral)  (Agree)  (Strongly Agree)  (Not Applicable)

13. I received useful feedback from my peers in the **video lesson** challenges.

    (Strongly Disagree)  (Disagree)  (Neutral)  (Agree)  (Strongly Agree)  (Not Applicable)

14. The **video lesson** challenge gave me time to think and draft my online responses.

    (Strongly Disagree)  (Disagree)  (Neutral)  (Agree)  (Strongly Agree)  (Not Applicable)

15. The **virtual office visits** provided me with answers to my specific questions.

    (Strongly Disagree)  (Disagree)  (Neutral)  (Agree)  (Strongly Agree)  (Not Applicable)

16. I received additional feedback from my instructor during the **virtual office visits**.

    (Strongly Disagree)  (Disagree)  (Neutral)  (Agree)  (Strongly Agree)  (Not Applicable)
17. The **virtual classroom** provided opportunities for me to interact with other people.

   (Strongly Disagree)   (Disagree)   (Neutral)   (Agree)   (Strongly Agree)   (Not Applicable)

18. In the **virtual classroom**, I felt that the instructor listened to my perspective.

   (Strongly Disagree)   (Disagree)   (Neutral)   (Agree)   (Strongly Agree)   (Not Applicable)

19. The asynchronous discussions (where I posted my discussions at any time of the day) in **Facebook** were easier for me than traditional discussions.

   (Strongly Disagree)   (Disagree)   (Neutral)   (Agree)   (Strongly Agree)   (Not Applicable)

20. When I had a question it was easy to get help from my classmates in **Facebook**.

   (Strongly Disagree)   (Disagree)   (Neutral)   (Agree)   (Strongly Agree)   (Not Applicable)

21. In what ways did the opportunities to interact with your instructor and peers in these online lessons affect your level of satisfaction with the lessons?

   _____________________________________________________________
   _____________________________________________________________
   _____________________________________________________________
   _____________________________________________________________
   _____________________________________________________________

22. Please share any pros and cons you have regarding the **introductions/check-ins**.

   _____________________________________________________________
   _____________________________________________________________
   _____________________________________________________________
   _____________________________________________________________
   _____________________________________________________________

23. Please share any pros and cons you have regarding the **video lesson** learning experience.

   _____________________________________________________________
   _____________________________________________________________
   _____________________________________________________________
   _____________________________________________________________
   _____________________________________________________________

24. Please share any pros and cons you have regarding the **virtual office visits**.
25. Please share any pros and cons you have regarding the **virtual classroom**.

26. Please share any pros and cons you have regarding **Facebook**.

27. Can you suggest ways to improve satisfaction for online learners? I welcome any ideas that you would like to share.
Demographic Survey

1. What is your age?  22 and under ____  23-29 ____  30-36 ____  over 36 ____

2. How many online courses have you taken in your life? ______
   a. Were any of your courses completed partly in a classroom and partly online? _____

3. Do you prefer working in groups or alone? (Pick either a. or b.)
   _____ a. Social (learn working with groups or other people)
   _____ b. Solitary (learn through working alone)

4. How do you learn best? Order the following 1 to 4 (1 being your first choice).
   _____ Visual (learn through the use of pictures and images)
   _____ Aural (learn through the use of sound and music)
   _____ Verbal (learn through the use of words)
   _____ Physical (learn through body, hands, and sense of touch)

I would like to sincerely thank you for your participation.
Appendix E: Mini- and Post-survey Quantitative Results

Table E1.1

Check-in/Introductions versus Sense of Community and Level of Interaction

<table>
<thead>
<tr>
<th>Mini-survey</th>
<th>Sense of Community</th>
<th>Level of Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson 1, n=13</td>
<td>Question 1 3.5</td>
<td>Question 6 3.5</td>
</tr>
<tr>
<td>Lesson 2, n=13</td>
<td>3.46</td>
<td>3.75</td>
</tr>
<tr>
<td>Lesson 3, n=13</td>
<td>3.33</td>
<td>3.846</td>
</tr>
<tr>
<td>Lesson 4, n=9</td>
<td>3.33</td>
<td>3.11</td>
</tr>
<tr>
<td>Lesson 5, n=12</td>
<td>3.466</td>
<td>3.272</td>
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<table>
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<tr>
<th>Post-survey, n=16</th>
<th>Sense of Community</th>
<th>Level of Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 3 3.5</td>
<td>Question 4 3.875</td>
<td>Question 11 3.062</td>
</tr>
</tbody>
</table>

Table E1.2

Video Lesson Challenge versus Sense of Community and Level of Interaction

<table>
<thead>
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<th>Mini-survey</th>
<th>Sense of Community</th>
<th>Level of Interaction</th>
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<tbody>
<tr>
<td>Lesson 1, n=13</td>
<td>Question 2 2.75</td>
<td>Question 7 2.92</td>
</tr>
<tr>
<td>Lesson 2, n=13</td>
<td>2.9</td>
<td>3.2</td>
</tr>
<tr>
<td>Lesson 3, n=13</td>
<td>3.363</td>
<td>3.454</td>
</tr>
<tr>
<td>Lesson 4, n=9</td>
<td>3.375</td>
<td>3.555</td>
</tr>
<tr>
<td>Lesson 5, n=12</td>
<td>3.416</td>
<td>3.583</td>
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</table>

<table>
<thead>
<tr>
<th>Post-survey, n=16</th>
<th>Sense of Community</th>
<th>Level of Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 3 2.875</td>
<td>Question 4 3.562</td>
<td>Question 13 3.312</td>
</tr>
</tbody>
</table>
Table E1.3

*Virtual Office Visit versus Sense of Community and Level of Interaction*

<table>
<thead>
<tr>
<th>Sense of Community</th>
<th>Level of Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini-survey Question 3</td>
<td>Question 8</td>
</tr>
<tr>
<td>Lesson 1 (n=13) NA</td>
<td>NA</td>
</tr>
<tr>
<td>Lesson 2 (n=13) NA</td>
<td>NA</td>
</tr>
<tr>
<td>Lesson 3 (n=13) 3.66</td>
<td>3.27</td>
</tr>
<tr>
<td>Lesson 4 (n=9) 3.875</td>
<td>3.125</td>
</tr>
<tr>
<td>Lesson 5 (n=12) NA</td>
<td>NA</td>
</tr>
<tr>
<td>Post-survey (n=16) Question 5 Question 6 Question 15 Question 16 3.866 3.133 3.625 4.125</td>
<td></td>
</tr>
</tbody>
</table>

Table E1.4

*Virtual classroom versus Sense of Community and Level of Interaction*

<table>
<thead>
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<th>Sense of Community</th>
<th>Level of Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini-survey Question 4</td>
<td>Question 9</td>
</tr>
<tr>
<td>Lesson 1 (n=13) NA</td>
<td>NA</td>
</tr>
<tr>
<td>Lesson 2 (n=13) NA</td>
<td>NA</td>
</tr>
<tr>
<td>Lesson 3 (n=13) NA</td>
<td>NA</td>
</tr>
<tr>
<td>Lesson 4 (n=9) NA</td>
<td>NA</td>
</tr>
<tr>
<td>Lesson 5 (n=12) 2.75</td>
<td>3.5</td>
</tr>
<tr>
<td>Post-survey (n=16) Question 7 Question 8 Question 17 Question 18 3.687 3.562 3.687 3.928</td>
<td></td>
</tr>
</tbody>
</table>

Table E1.5

*Facebook versus Sense of Community and Level of Interaction*

<table>
<thead>
<tr>
<th>Sense of Community</th>
<th>Level of Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini-survey Question 5</td>
<td>Question 10</td>
</tr>
<tr>
<td>Lesson 1 (n=13) 3.33</td>
<td>2.875</td>
</tr>
<tr>
<td>Lesson 2 (n=13) 3.166</td>
<td>3.2</td>
</tr>
<tr>
<td>Lesson 3 (n=13) 3.7</td>
<td>3.625</td>
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<tr>
<td>Lesson 4 (n=9) 3.125</td>
<td>3</td>
</tr>
<tr>
<td>Lesson 5 (n=12) 4</td>
<td>3.333</td>
</tr>
<tr>
<td>Post-survey (n=16) Question 9 Question 10 Question 19 Question 20 3.166 4.153 2.428 3.692</td>
<td></td>
</tr>
</tbody>
</table>
### Table F1.1

**Pros for each Modality – Mini-Survey - Question 11**

<table>
<thead>
<tr>
<th>Cons</th>
<th>Themes</th>
<th>Sense of Community</th>
<th>Level of Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Enjoyment</td>
<td>Connections</td>
</tr>
<tr>
<td>Introductions \ Check-ins</td>
<td>Sharing videos about our hobbies was such an interesting way to communicate but provided a solid sense of community with my classmates. Putting a name and a face to avatars gives a human feel. Gave the program some relatability / familiarity.</td>
<td>Pretty interesting and helps to get to know people better. Opportunity to give a bit of background information about ourselves. Because I learned more about my peers.</td>
<td>Allowed me to voice my opinion and to listen to others</td>
</tr>
<tr>
<td>Video Lesson Challenge</td>
<td></td>
<td>Allowed me to feel part of a community. Doing the challenge with my group gives me a sense of community. The group challenge gave me a sense of community.</td>
<td>Got my group to communicate. Forced us to communicate on D2L. As the communicating gets easier, the work gets harder.</td>
</tr>
<tr>
<td>Virtual Office Visit</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Virtual Classroom</td>
<td>Blackboard was a great way for us to interact in an almost face to face environment. The online room felt like an actual classroom complete with shenanigans and order. It was fun because it involved chatting online which was enjoyable and helpful.</td>
<td>It allowed us to interact beyond just doing work. Makes you feel far more connected to your class and teacher.</td>
<td>The online chat was a good way to share ideas.</td>
</tr>
<tr>
<td>Facebook</td>
<td>Allowed me to share memorable times in my life with my peers.</td>
<td>Makes you feel more connected. Talking in Facebook contributed to my sense of community because I got to learn more about my peers.</td>
<td></td>
</tr>
</tbody>
</table>
Table F1. 2

*Cons for each Modality – Mini-survey - Question 11*

<table>
<thead>
<tr>
<th>Cons</th>
<th>Sense of Community</th>
<th>Level of Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductions \ Check-ins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video Lesson Challenge</td>
<td></td>
<td>Great, but hard to constantly communicate. Feel like I am in a vacated chat room with spacey posts.</td>
</tr>
<tr>
<td>Virtual Office Visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virtual Classroom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facebook</td>
<td></td>
<td>I find creating interaction very difficult. I was only able to interact with a handful because most did not respond.</td>
</tr>
</tbody>
</table>
### Appendix G: Post-survey Open Ended Question Summary

#### Table G1.1

**Post-survey Pros Summary**

<table>
<thead>
<tr>
<th>Pros</th>
<th>Sense of Community</th>
<th>Level of Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductions / Check-ins</td>
<td>It really gets us warmed up and started for the lessons. I liked posting photos and seeing the other photos. Check-ins was fun for the most part.</td>
<td><strong>Gives me a chance to learn more about people. Allowed everyone to be more personable and comfortable. Check-ins helped boost the comfort level. I was more comfortable doing check-ins online.</strong> It helps me to understand the other students. I could speak without worrying. I was more satisfied because I had more chances to collaborate.</td>
</tr>
<tr>
<td>Video Lesson Challenge</td>
<td><strong>A huge pro was being able to pause and rewind the videos to catch what I missed.</strong></td>
<td><strong>The videos were easily accessible anytime. Easy to make good use of my time.</strong> When everyone is online together it is helpful to bounce ideas around.</td>
</tr>
<tr>
<td>Virtual Office Visit</td>
<td><strong>It is good to have an idea of where you stand in the class and what to work on.</strong> My instructor was available anytime and this made me feel privileged</td>
<td><strong>This was a great way to get feedback from my instructor.</strong> <strong>I liked the one on one. The instructor is paying full attention to you.</strong></td>
</tr>
<tr>
<td>Virtual Classroom</td>
<td>I enjoyed online chats. <strong>The classroom was fun and good to help your team out. It was interesting. Useful when students are fully online and from different provinces. It’s good that the instructor can be online. Everyone can chime in.</strong></td>
<td>It's a good way to communicate. I enjoyed talking to everyone. It's good that your ideas are thrown onto the page for everyone to see rather than being talked over or misheard. It was a good place to incorporate everyone’s ideas. It feels like you are on a level playing field. It was a good way for everyone to interact together. Talking to peers can sometimes be more effective than a teacher for learning.</td>
</tr>
<tr>
<td>Facebook</td>
<td><strong>Easiest way to communicate online. Facebook gives push notifications and you can access it from your phone. It's a great way to connect with your friends from school.</strong></td>
<td>Easy way to share ideas or get questions answered. It's better than communicating in D2L.</td>
</tr>
</tbody>
</table>

* Denotes a frequently occurring response.
### Post-survey Cons Summary

<table>
<thead>
<tr>
<th>Cons</th>
<th>Discomfort</th>
<th>Time</th>
<th>Technology</th>
<th>Disconnection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductions \ Check-ins</td>
<td>I didn't like posting a video of myself online. Check-ins are invasive, I do not want to share my life with the class. It forces people to communicate.</td>
<td><strong>It was hard to connect because of everyone's schedules.</strong></td>
<td><strong>I couldn't ask a question immediately. It's more difficult to interact online because people can just sit there and not say anything. Often need more than a day to respond. Prefer to watch the videos in class and where it is easier to discuss things.</strong></td>
<td>Interacting online felt less meaningful.</td>
</tr>
<tr>
<td>Video Lesson Challenge</td>
<td><strong>I would prefer learning in the classroom and then use the videos for review or clarification.</strong></td>
<td><strong>It takes too long when you are waiting for other students to get online to give you an answer.</strong></td>
<td>Texting would be more convenient than D2L. The website was confusing sometimes.</td>
<td></td>
</tr>
<tr>
<td>Virtual Office Visit</td>
<td>I don't like Skype, Google Hangouts or Face Time. I would rather have met in person.</td>
<td><strong>The connections were slow. It was a little awkward at times. Personal equipment can be a hindrance (Wifi).</strong></td>
<td></td>
<td><strong>I feel face to face is better for this.</strong></td>
</tr>
<tr>
<td>Virtual Classroom</td>
<td>I didn't interact as much as I would have liked, even though there were opportunities, this is likely due to my introverted nature. Virtual classroom seemed redundant.</td>
<td>Hard to interact because people would wait 2-3 seconds to talk. It takes more time. It was hard to get a word in when multiple people were trying to voice their opinions.</td>
<td>Some students can't afford computers and/or high speed internet. Little quirks with people trying to connect, hearing from everyone and learning to use the program. Latency problems with connections.</td>
<td></td>
</tr>
<tr>
<td>MODALITIES AND E-LEARNER SATISFACTION</td>
<td></td>
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<tr>
<td>Facebook</td>
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<tr>
<td>I don't Facebook.</td>
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<tr>
<td>Still difficult to get a hold of people sometimes, group text messaging would be faster. Difficulty with waiting for responses from others.</td>
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</tr>
</tbody>
</table>

** Denotes a frequently occurring response.
## Appendix H: Journaling Summary

Table H1.1

**Journaling Pro Summaries**

<table>
<thead>
<tr>
<th>Pros</th>
<th>Sense of Community</th>
<th>Level of Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enjoyment</td>
<td>Connections</td>
</tr>
<tr>
<td><strong>Introductions / Check-ins</strong></td>
<td>I liked the video check-in after the fact. Fun to take a break from homework. Check-ins are good online, never good in front of the class. Regular check-ins are great fun. Freeze up in face to face check-ins. Cool and I enjoy them.</td>
<td>Check-ins help me get over a lot of shyness, it's out of my comfort zone but helps me get to know people. Good understanding of who people are. Not as person to person as face to face. Broke the ice, get to know people. Nice to hear from others.</td>
</tr>
<tr>
<td><strong>Video Lesson Challenge</strong></td>
<td></td>
<td>Learn more about peers with the group connection.</td>
</tr>
<tr>
<td><strong>Virtual Office Visit</strong></td>
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<tr>
<td><strong>Virtual Classroom</strong></td>
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<tr>
<td><strong>Facebook</strong></td>
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</tbody>
</table>
Table H1.2

*Journaling con summary*

<table>
<thead>
<tr>
<th>Cons</th>
<th>Discomfort</th>
<th>Time</th>
<th>Technology problems</th>
<th>Communication</th>
<th>Collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductions / Check-ins</td>
<td>Uncomfortable with the online video. Hardest part is the photos and video. Would like to be less introverted.</td>
<td>Frustrated when it takes time away from homework.</td>
<td></td>
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<tr>
<td>Video Lesson Challenge</td>
<td>Steep learning curve.</td>
<td>Groups are driving me nuts, **waiting around for peers to post. Need set deadlines. Awkward to connect. Just say everything solo, get it out there. One sided.</td>
<td>Navigation is frustrating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virtual Office Visit</td>
<td></td>
<td></td>
<td>First lesson was hard to communicate</td>
<td>Easier to use Facetime.</td>
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</tr>
<tr>
<td>Virtual Classroom</td>
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<tr>
<td>Facebook</td>
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</tbody>
</table>

** Denotes a frequently occurring response.