

ATHABASCA UNIVERSITY

EXAMINING THE EXPERIENCES OF SECONDARY SCHOOL TEACHERS
WITH RURAL VIDEOCONFERENCE COURSES

BY

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF EDUCATION IN DISTANCE EDUCATION

THE CENTRE FOR DISTANCE EDUCATION

ATHABASCA, ALBERTA

MAY 26, 2016

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Approval of Thesis

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**“EXAMINING THE EXPERIENCES OF SECONDARY SCHOOL TEACHERS WITH RURAL
VIDEOCONFERENCE COURSES”**

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Master of Education in Distance Education (Med)

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Dedication

I would like to dedicate this work to my family – those who are with me to celebrate the completion of this thesis, as well as those we lost along the way. I am forever grateful for your love – it has given me a place to belong.

Acknowledgements

I would like to thank my supervisor, Dr. Debra Hoven, for her patience and support through this entire process. I appreciated her understanding when disaster struck and I was unable to work. She waited patiently until I was ready to resume. Dr. Hoven's suggestions and comments helped to provide me direction and focus. Her exceptional proof reading has made this product immensely more refined than my original draft.

I would also like to thank Wynter Oakes for her willingness to listen to my ideas and concerns throughout this project. She spent hours reading and commenting on my early drafts.

I am grateful to the six teachers from my school district who participated in this project. They gave their personal time to complete the questionnaire and participate in the interview. I believe that the school district has already started to benefit from their input.

Lastly, I could not have completed this project without the support of my husband, Brent. He took over many of the daily life tasks in order to free up more of my time to work. He is, and always will be, my true partner.

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Abstract

This case study explored the experiences of secondary school teachers teaching a videoconference course simultaneously in four rural schools in one school district. The exploration encompassed positive experiences, challenges, and the personal attributes of the teachers that contributed to their success. Six teachers with experience teaching videoconference courses in rural schools completed an individual questionnaire and participated in a follow-up interview. The results of this study comprise a description of the experience of being a rural videoconference teacher in a particular school district, as well as a list of teacher attributes that participants identified as contributing to their success as videoconference teachers.

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Definition of Terms

Term	Definition
Distance education	Education delivered by an institution whereby the teacher and students are separated by geography, and perhaps time, but are connected by technology (Bernard, Abrami, Wade, Borokhovski, & Lou, 2004; Simonson, Schlosser, Orellana, 2011).
Equivalency	Simonson, Schlosser, and Hanson (1999) define equivalency as the process of designing “learning events that provide experiences with equal value for learners” (p. 71). They further state “the experiences of the local learner and the distant learner should have equivalent value even though these experiences might be very different” (p. 71).
Room-based videoconference (VC) system	Within the school district in this study, the room-based VC system used codec hardware to connect the network of four rural schools. The teacher was in one of the rural schools, transmitting to the other schools. This system used Cisco bridging and monitoring with Sony endpoints (T. Ray, personal communication, June 4, 2016) and included a microphone, one television, two cameras in three of the schools and only one camera in the fourth school. In addition to this, the VC rooms had SmartBoard™ interactive whiteboards, which were connected using Bridgit™ software.
Remote school	A school with students receiving instruction via VC from a teacher located in another school.
Videoconference (VC) course	In the school district in this study, a VC course is defined as a synchronous course offered to students in the same location as the teacher, as well as to students from one to three additional locations via video. The teacher had contact with the students from the remote schools through email, a school district Moodle™ site, and at least two face-to-face meetings.

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CHAPTER I

INTRODUCTION

British Columbia is comprised of many diverse school districts and the number of students and geographic size of these districts varies greatly throughout the province. School districts within high population areas have few, if any, rural schools, while the school districts with larger geographic areas often have several small rural schools. School districts with large travel distances to small rural schools often struggle to offer all students programs of equal quality. As a result, in the years preceding this study, some school districts had started to explore alternatives to the face-to-face classroom. One of these alternatives was a room-based videoconference system (VC).

History of the VC Program in the study

As a result of declining enrolment in its rural schools, the school district that was the site of this thesis research study was one of the first in British Columbia to use VC courses as a means of offering greater course choice to prepare senior students in rural schools for university programs. Without the kind of teaching and learning provision offered by VC, many rural students would be unable to study the prerequisite courses for their chosen or desired post-secondary programs of study.

Planning for the secondary school VC program began in late 2001 or early 2002, the initial implementation was in 2003, and in October 2004 the school district won the Ministers Award for School Board Innovation in Technology (Ministry of Education) (J. Cuzzola, personal communication, February 9, 2016).

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The delivery of VC, from 2003 through 2008, in the school district in the study involved a single urban school delivering VC courses to the four rural schools. Room-based videoconference systems in the school district synchronously linked the rural schools through SmartBoards™, video, and audio. In 2009, this format changed so that the rural schools delivered their own VC courses. Eight teachers in the rural schools were assigned to teach the eight rural VC courses. Each VC teacher was responsible for students in his/her home school as well as students registered for his/her course in the all of the remote schools.

The four rural schools were connected by a room-based videoconference system. There was flexibility in the connection, allowing all four schools to be connected simultaneously, or there could be two connections, each between two schools. While there had been discussion of expanding the number of course offerings in the future, at the time of this study, the schools shared eight courses each school year. Alternatively, if a VC course was shared between only two schools, the remaining two schools could create a separate connection to offer a different course. Both of these situations had occurred in the past. The number of schools participating in each VC course was determined by student registration in each school. Some VC courses had students in all four schools while others had students in only three or two schools. All of the rural VC courses were at the grade 11 or 12 level, but grade 10 students had participated in these courses on occasion.

It is important to note that not all VC connections used in classrooms are as described above. Many school districts, such as ones in Texas (Texas Education Telecommunications Network), Portland (Portland Schools), and even the school

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district in this study use VC to allow classes to take virtual field trips and to connect with scientists, authors, museum curators, and other experts. Some classes used VC to connect to other classrooms in order to learn about and with students in another province or country. The use of VC was usually a one-time event or a short series of sessions. However, the VC described in this study was different because it involved a whole course delivered through daily VC sessions for a full semester. There was some indication that the Texas and Portland websites may also offer full courses, but specific information about them was not found on their websites.

Moreover, VC technology is in sharp contrast to other methods of DE course delivery, such as correspondence by mail, teleconferencing (telephone – audio without video), online courses (asynchronous), and audiographics (audio with a connected whiteboard but no video) (Varnhagen & Fuchs, 2004).

THE RESEARCH STUDY

The research study presented in this thesis aimed to investigate and describe the experience of rural VC teachers in a school district in British Columbia using an intrinsic case study within a qualitative research methodology. The study aimed to provide a description of experiences that could provide some basis for aiding school administrators and teachers in the selection of future VC teachers, improving the experience of future rural VC teachers here and elsewhere, and to provide suggestions for better ways of tailoring professional development (PD) provision. The study, with the interviews conducted in June 2013, involved

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six secondary school teachers who had taught at least one VC course in the previous four-year period.

This following section describes the context of the study by outlining the problem and its background information within the school district. It will also present a summary of the research questions, significance of the study, and outline the organization of the thesis. Further chapters will present a discussion of the literature relating to this study, provide more detail on the research methodology, present the seven themes found within the results, and discuss how these results could be beneficial to the school district in the study. The researcher was an employee of the school district involved in the rural VC program so a description of her role as both the employee and researcher is summarized.

Context of the Study

In early spring students selected their courses for the following school year. Rural school administrators selected VC courses based on the number of students who selected each course from a list of possible VC course. The first option for each school was to offer the course face-to-face if there were enough interested students. If a course was not offered locally but there were enough students to create a class when considering students at the other rural schools, and there was a teacher available to teach the course, then it was offered through VC. Students were physically placed in VC courses by their home school and the VC teacher's home school ensured that they were properly registered on the school district's student management system. The VC teacher's home school kept a

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record of all students' marks and grades, with reports sent to the students' home schools for official report cards and placement in student files.

Eight teachers selected from the rural schools were each assigned one VC course. Some rural schools did not have any teachers assigned a VC course and other schools had two or three teachers assigned a VC course. However, since the completion of the study the rural schools have elected to share the teaching duties equally and each rural school provides a teacher for two VC courses each year. The VC teacher from one rural school (who may or may not have had students at his/her home school) met via videoconference with students in one, two, or three other rural schools (called remote schools in this description). The students in the remote schools did not have an adult in the room with them. A single VC teacher supervised the students in all schools.

All rural VC courses were created by a rural VC teacher and posted on the school district VC Moodle™ site. Returning teachers were encouraged to expand or change their course(s) as needed. Many experienced rural VC teachers had requested that a copy of the VC Moodle™ course be put on their school Moodle™ site so they could use it in their face-to-face classroom as well. New VC teachers were given access to the Moodle™ course from the previous rural VC teacher and encouraged to alter it to suit their teaching needs. One of the study participants who taught a rural VC course early in the program did not use Moodle™ but commented that would have been a goal if he/she had continued teaching rural VC.

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Most rural VC teachers used Moodle™ to house information for their students to access easily. In the beginning of the program the Moodle™ courses were locked and students were hand-loaded into the site by the rural VC coordinator to allow them access to their VC course(s). However, at the teachers' request, there had been a shift to leaving the courses open to the public so that there was no need to hand-load the students into the site. Most teachers had not explored the use of the calendar, assignment/test submission, or discussion features of Moodle™, despite being encouraged to do so by the rural VC support person.

While most rural VC teachers were using Moodle™ to disseminate information, a few of them still used fax or scan and email to send information to the remote schools. This information was sent to a school secretary, counselor or teacher assigned to oversee the rural VC courses. That adult then made copies and delivered them to the VC students. Tests for all courses were handled in this manner. Each VC suite included a printer for student use but VC teachers did not usually send materials directly to the students. The printer was used to print material posted on the Moodle™ site. Most completed student work was delivered to the school office and the secretary scanned it to be able to email it to the VC teacher's home school. If the work was a project that could not be scanned, it was sent by school mail to the VC teacher's home school but this option could take up to two weeks to arrive and then up to another two weeks to return to the student.

In order to facilitate the VC course offerings, the semester timetables and school calendars for the four rural schools were aligned. Synchronous VC contact

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with the students in remote schools occurred when each class met for approximately 75 minutes daily, and face-to-face contact occurred daily with the students in each teacher's home school and with the students in the remote schools when, twice throughout the semester, each VC teacher traveled to each remote school. When the VC teacher travelled to the remote schools, he/she had access to the same equipment, so lessons were similar to those presented in his/her home school. VC teachers used these visits to develop their relationships with the students in the remote schools rather than present a unique lesson. The VC teachers selected the dates for their travel and made arrangements for their own substitute teacher through the school district employee management system.

The distance between schools was such that travel to and from the remote schools required a day in most cases, and a half-day in one case, and therefore, VC teachers were provided with substitute teacher coverage for all of their non-VC classes when they traveled. On travel days, the VC teacher taught only their VC course. The rural VC support person tracked the number of substitute teacher days used by the rural VC program. There was also asynchronous contact with VC students when VC teachers used email to contact students outside of class time. Also, more VC teachers were beginning to use online grading programs to allow students and parents easy access to marks.

At the time of the study, the VC suites available to the rural VC teachers participating in the study were all equipped with a large television or projector and screen, microphones and speakers, a SmartBoard™ with a computer loaded with Bridgit™ to synchronize the boards between the locations, a document projector, a

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printer, and at least six student computers. See Figure 1 for a photo of one VC suite in the school district and Figure 2 for a photo of the Bridgit™ connection on the teacher computer. In addition, all the VC suites, with one exception, had a video camera both at the front and the back of the room. The VC suite with only one video camera (positioned at the front) was in the process of being altered to contain two cameras for better video coverage. Overall, the combination of various technologies available for use enabled the VC teachers to incorporate a variety of teaching and assessment strategies into their courses. As recommended by Mitchell et al. (2010), electronic documents could become the foundation of notes for students, and visual graphics and Internet resources could supplement the teacher's instructional strategy.

The technician assigned to support VC had the system set to be as user-friendly as possible. The computers that ran the system were never turned off so that the technician could service them remotely. To save energy and bulb life, the student computers and SmartBoards™ were set to come on automatically at the beginning of the school day and to shut off at the end of the day. The VC teachers were taught how to use the remaining equipment and they then taught the students. The technician used the common timetable to schedule the video connection between the schools in each course (it could change each block, as not all rural schools participated in all of the VC courses). The VC teachers therefore simply had to ensure that the television was turned on. As well as the television, all of the VC teachers used the cameras and audio equipment, though not everyone use the DVD player or the data projector.

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Figure 1. VC suite in one school from the school district in the study. This photograph shows some of the equipment available: SmartBoard™, television, teacher and student computers.



Figure 2. Computer screen of the control computer in the VC suite in Figure 1. This photograph shows the Bridgit™ software used to connect the SmartBoards™ in the rural schools.

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In the literature, blended or hybrid courses are defined as a combination of face-to-face and online instruction (Ndon & Martin, 2006; Negash, Wilcox & Emerson, 2007; Parkes et al., 2011; Petrova, 2001). Even though the school district had named this program their 'rural VC system', it might be more accurate to call it a 'rural modified hybrid system'. Similar to the hybrid courses described in the literature, this system had a face-to-face component, albeit very small for students in remote locations, and there was use of an online system, even though typically very little course instruction was given on it. This rural system relied most heavily on VC for instruction and contact between the teacher and students.

During the daily class time, teachers used the video/audio technology to communicate directly with students and used Bridgit™ to connect the SmartBoards™ between the home and remote VC suites. Generally, the SmartBoards™ were used as a whiteboard to broadcast information to all the schools simultaneously. Some of the VC teachers used the television to broadcast DVD material to all sites simultaneously. Most, but not all, of the VC teachers also used the learning management system Moodle™ to help provide instructional materials to the students in their remote schools. Moodle™ provided VC teachers with a means of organizing their course materials as well as control over the delivery of some of the materials to the students. Alternatively, the other option of delivery of course materials to students was scanning and emailing them to the remote schools, after which someone at each site would have to deliver those materials to the students in the course. At the time of the interviews, social media was not often being used within the VC classroom but that has since changed with

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more VC teachers using their cell phone and/or social media to contact their students in remote schools.

At the time of the study the school district had the need for eight rural VC teachers each year. However, each rural school had recently been given a portable VC unit, in addition to the regular VC suite, so there was the possibility of the rural schools offering up to eight additional VC courses each year. All rural VC teachers were subject specialists. Most of them taught one VC course each year but some taught two (one each semester). However, the hiring patterns within the district showed that many teachers started their careers in a rural school and stayed for only a few years before transferring to a school within the city. This resulted in regular staff turnover within the rural schools and, as a result, within VC instruction.

The majority of the rural VC students in this school district were in grades 11 and 12. Rural students who planned on attending college or university often took one or more VC courses to adequately prepare themselves for post-secondary academic programs. The courses that had been taught through rural VC included: BC First Nations 12, Biology 12, Comparative Civilization 12, Chemistry 12, French 12, Geography 12, Law 12, Math 11, Math 12, and Physics 12. The students selecting these courses were often motivated to succeed because the course was part of a university requirement for admission.

It was vital that the rural VC program continued to be successful in this district and an important component to creating course and program success was the VC teacher (Bernard et al., 2004; Gillies, 2008; Offir & Lev, 2000). In order

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for the program to be successful, it was necessary that teachers be adequately trained in using the VC technology (Dogett, 2008; Hobbs, 2004; Offir & Lev, 2000) and in the intricacies of using video to: develop a relationship with students (Moore & Kearsley, 2005), promote student-teacher-material interactions (Lai & Pratt, 2009), deliver a lesson, and manage multiple classrooms simultaneously (Cuffman & MacRae, 1996; Dogett, 2008; Jakupcak & Fishbaugh, 1998; MacIntosh, 2001; Mitchell et al., 2010). Teachers must also use solid instructional practices (Cohen, 2003; Jakupcak & Fishbaugh, 1998) and receive training to understand the impact that the VC technology has on pedagogy and individual teaching style (Lai & Pratt, 2009). One participant in Anderson's (2008) study on VC applications in five early-adopter school divisions in Alberta noted that the quality of the VC program was contingent on the set of skills held by, and training given to, the VC teachers.

Lai and Pratt (2009) found that without professional development teachers did not adequately plan for the impact of the VC technology on their course delivery when modifying a face-to-face course for delivery through VC. Course pedagogy is not the same for VC as it is for a face-to-face course or an online DE course (Mitchell et al., 2010). Teachers must, for example, consider methods for providing an equivalent learning experience for students in all locations (Bernard et al., 2004; Simonson et al., 1999; Simonson et al., 2011). However, while some VC programs provide training on the VC technology, they do not offer in-depth pedagogical training (Anderson, 2008). Barter (2013) in his comparison of three projects involving VC noted that such training was not readily available:

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Pedagogically, since the District could find no similar teaching via video conferencing that could provide guidance, teachers were left to solve problems by themselves. With no other instruction than their own experience, they relied on the practices they knew, face-to-face traditional classroom teaching. This did not prove to be successful as students on camera in another school often felt left out as teachers tried to cope with the technology (i.e. intrusion of the camera in the class, poor visual and sound reception) and teach two groups of students (in-class and virtual). (p. 46)

As mentioned previously, there was the potential for the school district within this study to need as many as 16 rural VC teachers each year. However, there were very few teachers and administrators who had an understanding of the experience of being a VC teacher. Administrators relied on intuition to select teachers to teach VC courses and teachers had very little information with which to make a decision about whether to become a VC teacher or not. Therefore, knowledge of the benefits and challenges of teaching a VC course to prospective VC teachers and identifying the perceived qualities of an effective VC teacher would be useful to both administrators and prospective teachers.

There was no training required or offered to VC teachers in this school district and, therefore, VC teachers either discovered best practices through a trial-and-error process or they struggled. Understanding the VC teaching experience would help the school district to support future VC teachers through the challenges.

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Background to the Problem

The school- and district-level administrators were very supportive of the rural VC program because it was necessary to provide rural students with academic opportunities comparable to those of the students at the larger urban schools. Through the rural VC system, courses with less student demand could be offered in small rural schools and the expertise of subject specialist teachers could be shared amongst the schools. As noted by Montgomerie and King (2012), not all rural or remote schools have the expertise to offer certain subjects.

The school district and school levels of administration had demonstrated an open attitude towards ideas that would improve and promote the success of the VC program. The school district had committed a great deal of resources to VC instruction. They had established state-of-the-art VC suites within the schools, which will be described in more detail in Chapter 3, and hired a computer technician to ensure the smooth operation of the systems. However, it appeared that little consideration had been given to a formal VC teacher selection process. Historically, VC teaching assignments had mainly been made based on rural principals selecting possible candidates from their staff, discussing which school would host each VC course, and finally, offering the VC course to the teacher in the school selected to host the course. Principals used their own criteria for selecting possible candidates and attempted to select the teacher who was considered most suitable for making the adaptations necessary to be successful in the VC environment. Then, for the first time, in the 2011-2012 school year, a rural VC teacher transferred to one of the urban schools; subsequently, the teacher's VC

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course was advertised as part of the teaching responsibilities included in the position description posted within the school district. As the VC course was part of a posted teaching position in this situation, the principal had little input into the selection of the VC teacher because Human Resource staff filled the posted position based on the applicants' teachable subjects and seniority. The result was that teachers without a teaching position in the school district could accept a position and teach a VC course as part of the job, rather than because they had a particular interest in teaching a VC course or the skills to support the VC teaching assignment.

While reliable VC technology is vital to student satisfaction with a VC course (Gillies, 2008), the teacher's contribution to student learning is also significant (Anderson, 2008; Cohen, 2003; Lai & Pratt, 2009; Offir & Lev, 2000). Therefore, it was imperative that the most suitable teachers be selected for participation in the rural VC program. In order for this to occur, administrators needed to have a good understanding of the experience of being a VC teacher. Furthermore, it was also important that, if invited to participate, classroom-based teachers had a clear understanding of the experience of being a VC teacher in order to be able to give an informed response. While VC teachers were not always new teachers, they were new to teaching through VC; as such, they needed to learn new skills and pedagogies (Lai & Pratt, 2009) similar to beginning teachers. The VC teachers needed to be supported and encouraged in order for the schools and district to ensure effective teaching and learning via VC. In their discussion of the history and evolution of the uses of VC in education, Montgomerie and King

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(2012), for example, suggested that school administrators need to understand how a VC program operates and be educated on how they can support the VC teachers. In addition, Barter (2013) urged institutions responsible for teacher training to recognize the value of rural education.

Statement of the Problem

Although the VC program had been in operation in the school district since 2003, few administrators and teachers had personal experience with teaching a VC course. To make sound decisions regarding the VC program, such as the selection of future VC teachers, administrators needed to understand the experience of teaching a VC course and the attributes of an effective VC teacher. Furthermore, it was important that teachers who were considering becoming a VC teacher understood the experience before they accepted the position.

An effective teacher selection process could also contribute to the long-term retention of VC teachers, allowing novice VC teachers to become experienced VC teachers. In a study of the challenges and supports for novice teachers, Fantilli and McDougall (2009) stated that “strong evidence suggests that teacher effectiveness spikes sharply after the first few years in the profession” (p. 814); therefore, it was important that VC teachers remain in a particular assignment long enough to gain the experience needed to be effective.

To help in achieving these aims, this study aimed to describe the positive experiences and the challenges encountered by rural VC teachers, as well as the attributes that rural VC teachers perceived as necessary for successfully teaching a VC course.

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Research Questions

The purpose of this case study was to develop an in-depth description and analysis of the collective experience and qualities of the VC teachers in one school district. The desired outcome of this study was a rich and deep account of the experiences of VC teachers, including both the positive experiences and the challenges, as well as a list of perceived VC teacher qualities. The following research questions were used to guide the study:

- 1) What positive experiences were gained by participating teachers from teaching a VC course? How were these experiences useful and/or enjoyable?
- 2) What challenges were experienced by participating teachers when teaching a VC course? How were these challenges overcome or addressed?
- 3) What personal attributes, skills, and/or talents contribute to participating teachers' perceived success as a VC teacher?

Significance of the Study

In his case study of one rural school, Barbour (2015) noted that “the number of virtual schools that rely on synchronous instruction as a primary or significant method of delivery is quite small” (p. 54). As shown in the next chapter, there is a great deal of research on DE but only a small portion of it is specific to using VC to deliver the majority of instruction within a course. This study is a small step towards fulfilling the need for research on using VC to deliver courses for secondary school students. More specifically, this study provided information to the school district in the study that could help select suitable VC

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teachers and provide relevant professional development to new and returning VC teachers. The significance of the study is discussed in more detail in theme 7 in Chapter IV.

Organization of the Thesis

This chapter provided a description of the school district in the study and context for the research problem. It also included the research questions and the significance of the study. Further chapters will elaborate on these topics: Chapter II will present a discussion of the literature relating to this study; Chapter III will describe the research framework and methodology; Chapter IV will present the results within the framework of the seven themes found within the results; Chapter V will provide a discussion of how these results could be beneficial to the staff and students in the school district in the study; and Chapter VI will present the conclusions drawn and implications for future research.

The following chapter contains the literature review presented in four main areas of research: modes of education delivery, impact of DE technology, DE teaching experience, and novice teacher experience.

CHAPTER II

LITERATURE REVIEW

Distance education (DE) has progressed from paper-based courses delivered by mail, through the introduction of electronic media, such as audiotapes and videotapes, as supplements to those paper-based courses, and, finally, to courses delivered entirely through electronic media, such as the Internet and VC (Moore & Kearsley, 2005). Much of the research on DE has focused on the comparison of DE delivery with face-to-face classroom-based delivery methods (Hobbs, 2004; Koenig, 2010; Offir & Lev, 2000; Witta, 2000). However, as Simonson et al. (1999) suggested, it is also important that research investigate the similarities and differences between the different delivery methods within DE. As shown in the review of the literature below, the focus of empirical research is shifting from concentrating on the differences to highlighting the similarities.

Types of Delivery and Equivalency

There appears to be considerable research on asynchronous types of DE, such as online courses, which are pre-set and offer the student email or other online connection to the instructor. These courses may, or may not, offer interaction between the students as well. The research base for synchronous types of DE seems to be smaller, with only a small number of articles found about programs where the students and instructor meet regularly via VC, as is the case in the school district in the study. Both asynchronous and synchronous DE will be discussed as both may have common teaching and learning skills, which may also apply to the skills and attributes required to teach in the rural VC program in the

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study (Bernard et al., 2004). Best practices in one area of face-to-face or DE teaching is likely applicable to other areas of teaching (Simonson et al., 2011).

In his study on social presence, Newberry (2001) compared face-to-face contact with six media types (VC, synchronous audio, text-based chat, e-mail, asynchronous audio, and threaded discussion) used in DE. He rated them on several factors, such as quality of feedback and ability for the students to discern emotion. He found that, while there was not a large range in the rankings, VC was ranked above all other DE methods and just below face-to-face contact in his “hierarchy of media richness” (p. 4). The findings of Anderson and Rourke’s (2005) investigation of the types of learning activities used with VC supported this by noting that it “affords rich interaction between participants” (p. 11) and allows activities that teachers and students are used to (Anderson & Rourke, 2005).

Simonson et al. (1999) introduced the concept of equivalency, and stated that the “more equivalent the learning experiences of distant learners are to those of local learners, the more equivalent will be the outcomes of the educational experiences for all learners” (p. 70). They further noted that it is the responsibility of the teacher to ensure that equivalency occurred by having the students participate in learning experiences that were tailored to the DE environment and individual situation.

In a meta-analysis of the equivalency theory of Simonson et al., Bernard et al. (2004) compared synchronous and asynchronous DE delivery methods. They suggested that as synchronous DE more closely resembles classroom-based instruction, it could be considered a special case of face-to-face instruction. Thus,

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since VC was considered synchronous DE by definition, it had many attributes that make it similar to face-to-face instruction. In addition, Simonson et al. (2011) suggested that rather than focusing on which medium was best, the interest should be on “what attributes of the medium can contribute to a positive, equivalent learning experience” (p. 127) for all types of education.

Areas of Exploration

This literature review is organized into four main areas: modes of education delivery, impact of DE technology, DE teaching experience, and novice teacher experience. Only a few articles addressing VC as a delivery method for DE or investigating DE within K-12 classrooms were found, but where possible, the implications for VC and the K-12 classroom were included in each of these four areas.

Initially, literature related to the experience of teaching VC courses and the experience of novice teachers was explored. The specific topic of teaching VC classes was addressed in only a few articles and websites. For example, in Australia, Mitchell, Hunter, and Mockler (2010) offered insights into a VC program with their investigation of five high schools in rural New South Wales. Their study specifically addressed the use of interactive whiteboards, in addition to investigating pedagogic strategies and “the enablers and constraints to teaching and learning in the e^2 environment” (p. 465). VC was also mentioned in studies comparing the interactivity of different types of DE (Newberry, 2001), and in comparison with face-to-face courses (Bernard et al., 2004). The website for Rural Advanced Community of Learners (RACOL) outlined some of the process a

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school district in northern Alberta went through to establish a VC system for their rural schools. This website included a final evaluation report conducted by Varnhagen and Fuchs (2004), which showed that the RACOL project had experienced a positive beginning with many concerns satisfactorily addressed within the first year.

Modes of Education Delivery

In their meta-analysis of interaction studies in DE, Bernard et al. (2009) suggested that as DE matured as an educational practice, there had been less need to justify it through comparisons with more established alternatives such as face-to-face instruction. Instead, they recommended that the different types of DE delivery be compared in an effort to develop a set of teaching competencies for each type. They also warned that, as each type of DE delivery had its own set of strengths, educators should be cautious when applying findings from general DE research to specific aspects of VC instruction.

While the main modes of education delivery are face-to-face, synchronous DE, and asynchronous DE, there were many blends that also occur. Bernard et al. (2004) in their meta-analysis of studies of synchronous DE (such as VC courses) and asynchronous DE (such as many online courses) suggested that “over the past several decades, two distinctly different patterns of distance education (DE) have emerged, along with a variety of combinations of them” (p. 102). They further commented that synchronous DE was linked to classroom instruction in a way that asynchronous DE was not, and suggested that the two forms of DE “may encompass different, but related, sets of teaching and learning skills” (p. 103). This

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connection suggested that face-to-face education, synchronous DE, and asynchronous DE are three related strands within education despite having varying degrees and types of teacher-student, student-student, and student-content interaction. This idea was further supported by Simonson et al. (1999) who noted, “Recent emerging theories based on the capabilities of new interactive telecommunication-based audio and video systems suggest that distance education may not be a distinct field of education” (p. 74). More recently, they stated the following: “*It is not different education, it is distance education*; what we know about best practices in education is most often also directly applicable to distance education” (Simonson et al., 2011, p. 140).

Bernard et al. (2004) found that the retention rate for students in synchronous DE courses was much higher than for those in asynchronous DE courses. They suggested that synchronous DE and face-to-face classroom conditions may be equivalent in certain situations, but not when considering the analysis of a large number of studies. In his case study, Barbour (2015) noted that students were more productive during the synchronous time than the asynchronous time when there was no teacher present. However, Anderson (2008) concluded that “used by itself, VC provides a relatively impoverished form of distance education compared to distance programming that uses a blend of communication technologies” (p. 121).

More than any other DE technology, the use of VC allows teachers to replicate the face-to-face classroom environment (Peterson, 2004). However, with this similarity comes the danger of teachers attempting to simply replicate their

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face-to-face course in a VC course without considering “the impacts of technology upon interactions in video conferencing” (Peterson, 2004, p. 64). Even though technology had advanced to the point where DE had the potential to emulate the face-to-face classroom, VC and the face-to-face classroom-based instruction did not provide the same experience (Anderson, 2008). Teachers must recognize that there must be changes in instructional strategies with any technology changes that occurred in the classroom (Offir & Lev, 2000). With these necessary changes, DE could be considered an equivalent alternative to the face-to-face classroom. In order to facilitate DE as an equivalent alternative, teachers should be encouraged to explore the technology to aid in developing student-centered activities and increased interaction between students in different locations (Varnhagen & Fuchs, 2004).

The face-to-face classroom, synchronous DE courses, and asynchronous DE courses are important components within an educational system. Teachers need to implement a set of teaching competencies common to all modes of delivery, as well as those specific to the mode of delivery for each particular course. More research is needed to identify specific teaching competencies for the different modes of delivery within DE, including consideration of DE technology and its impact on teaching a DE course (Cavanaugh, Barbour & Clark, 2009).

Impact of DE Technology

Koenig (2010) identified VC suite setup and technology support as important issues in VC courses but Anderson and Rourke (2005) found that case studies did not usually focus on this aspect, except to mention that the technology

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was often unreliable and that dedicated technical assistance was required.

Montgomerie and King (2012) also emphasized that technical support was critical to the success of a VC program. They also suggested that while a multi-point control unit was necessary when connecting more than two sets of VC equipment, the “equipment must be easy to use and allow for interactivity and engagement for the learner” (p. 271).

The technology used for DE instruction changes at a rapid rate and VC is no exception. Mitchell et al. (2010) contended that it was necessary for VC teachers to adapt their pedagogy as technology changed. In every type of DE delivery, it was most beneficial to the students to use the technology to its fullest potential. Anderson (2008) and Montgomerie and King (2012) supported this by adding that it was necessary for VC teachers to have a VC coordinator to alert them as new resources become available.

Certain attributes of VC have been identified as supporting its pedagogic value. Newberry (2001) ranked VC just below face-to-face instruction in terms of media richness, which he defined as “the ability of a medium to carry information” (p. 3). VC was identified as the most appropriate technology for DE in the K-12 school environment due to the real-time contact that allowed it to closely mimic the face-to-face classroom (Hobbs, 2004). The ease of presenting a VC course, as compared to an asynchronous DE course, was also a factor. However, according to Gillies (2008), comfort with VC technology was essential for the success of a VC course.

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VC teachers should be knowledgeable about how the technology works, as well as how it could interface with their instructional techniques (Hobbs, 2004; Offir & Lev, 2000). VC teachers also needed the ability to adapt and learn new teaching techniques using the available technology (Doggett, 2008). Cohen (2003) also recommended that online DE teachers should be able to use all of the components of the learning management system in order to provide the students with a range of learning activities and experiences.

While recommendations for VC suite technology were not found in the literature, there were descriptions of the technology used in several of the schools documented in the literature. This technology included the following: a multi-point video camera with a microphone or telephone for audio; a computer for operating the VC system; a television or screen; interactive whiteboards and a document camera (Dawson, 2010; Lai & Pratt, 2009; MacIntosh, 2001, Mitchell et al., 2010).

Students regularly used a variety of different forms of technology for communication and entertainment, but they needed to be shown how to use it for the purpose of learning (Parkes, Zaka & Davis, 2011). In addition to teachers having knowledge of the equipment, students must know when and how to use the features of the technology (Cohen, 2003; Jakupak & Fishbaugh, 1998). Teachers needed to ensure that students were adequately instructed in the use of the technology and that they were given opportunities to practice the necessary skills. In addition, the technology needed to be considered when planning student-led activities so the activities could easily be implemented via VC (Jakupak & Fishbaugh, 1998).

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Teaching with technology takes practice, and there were many mannerisms and behaviours that teachers needed to consider when teaching on video (Cuffman & MacRae, 1996). For example, to maintain student attention, teachers needed to stay within the camera range and employ good voice projection (Doggett, 2008). In addition, the teacher's position needed to allow students to see the teacher and the interactive white board (Mitchell et al., 2010). Furthermore, even though facial expressions may be difficult to read depending upon the camera and television quality, teachers needed to attempt to retain a positive facial expression (Jakupak & Fishbaugh, 1998).

Mitchell et al. (2010) suggested regularly checking the receiving locations on screen for lapses in attention or questions from students. Furthermore, because video technology results in slight delays in transmission, teachers needed to pause frequently when speaking and provide a longer wait-time after speaking or asking for a response (Jakupak & Fishbaugh, 1998; MacIntosh, 2001). Audio quality has also been noted as being very important (Anderson & Rourke, 2005).

DE Teaching Experience

In their study of an online gifted program offered to students in rural Australia, Banister, Cornish, Bannister-Tyrell, and Gregory (2015) stated that DE teachers must be curriculum experts, excellent teachers, and able to use technology in education. Technology is a vital part of a VC course and VC teachers needed to be willing to learn new teaching strategies to incorporate the VC technology into their lessons. While VC teachers were able to transfer some pedagogy from face-to-face classroom delivery, they also needed to consider the effects that the

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technology available to VC instruction would have on that pedagogy. New pedagogies must be employed in order to offer VC students instruction that was equivalent to that received by the students in the classroom (Bernard et al., 2004; Simonson et al., 1999; Simonson et al., 2011).

Lai and Pratt (2009) found that without formal training for VC teaching prior to teaching a VC course, most teachers did not reflect on how the VC format would support, or not support, their teaching. Lai and Pratt (2009) reported that the teachers in their study seemed surprised when it was suggested that using VC would have an impact on their teaching pedagogy.

Course design for DE courses is different from that of face-to-face courses and needed to be carefully considered (Hobbs, 2004; Witta, 2000). Activities for asynchronous online DE courses needed to be carefully planned and structured in advance, resulting in less opportunity for spontaneity (Witta, 2000). Synchronous VC courses typically required less planning and allowed more freedom than asynchronous online DE courses; however, advance planning is still necessary for distributing materials (Hobbs, 2004).

When developing a DE course, it is important to have a clear idea of the learner outcomes and good teaching practices (Jakupcak & Fishbaugh, 1998). Good instructional design is important for implementing the course and for promoting student learning. Cohen (2003) recommended that teachers base the course structure on learning theory and include clear lesson objectives, assignments that encourage critical thinking, and performance-based assessment strategies.

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Cuffman and MacRae (1996) reported that teachers tend to plan a course based on the content, and often fail to consider the characteristics of the expected students or how those students learn. They emphasized that DE courses must focus on the student, not on the content. Teachers needed to understand the type of student that chose to become a DE student, and find methods to connect with that type of student. Cohen (2003) found that students of all ages who chose to study through DE were often highly persistent, motivated to succeed, required minimal support to complete difficult tasks, and utilized good organizational skills. However, students did not always have the choice of whether or not to take a course via VC (Hobbs, 2004). For example, in a small rural secondary school, a VC course was the only format offered in a particular subject. VC teachers needed to consider that students registered in a VC course because of circumstance rather than choice may be less motivated, less confident, and require more support.

The majority of the literature found in this topic search was based on courses for adult learners at post-secondary institutions. As a result, there was very little information available about the type of student found in a secondary school, VC, or other DE, course. However, the research on DE programs, and more specifically on VC programs in K-12 schools is growing. Barbour's (2015) case study focused on the student experience in a VC program. These students commented that they felt a greater sense of community locally because of the small class size in their home school but that they did not feel the same connection within the virtual classroom. Banister et.al. (2015) found that student-student interactions were highly valued and helped to develop a sense of community

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within the virtual classroom. Cuffman and MacRae (1996) contended that “effective course planning emphasizes how instructional methods correspond to students’ learning styles” (p. 231). However, there was very little research available to help teachers identify the learning styles of students in VC courses.

Hayden (1999), in her doctoral dissertation on the characteristics and strategies needed to support constructivist learning experiences in a VC setting, identified two main types of instruction within a VC setting: instructionist and constructivist. She defines instructionist instruction as a method of instruction where the teacher provides information as the students listen and then do seatwork and she defines constructivist instruction as the teacher being a facilitator who develops activities for the learners to interact with the course content. In constructivist instruction, students use experience to develop personal meaning and understanding of the concepts. Hayden (1999) also reported that, while constructivist teaching is more complex and social interaction is necessary to deepen student learning, this method of delivery was becoming more desirable in contemporary classrooms. Anderson (2008) supported this position with his comment that a successful VC course allowed students to interact rather than simply listen. Hayden also found that VC teachers tended to use the same method of delivery in the VC classroom that they had used in their face-to-face classrooms. In order to use constructivist instruction in a VC classroom, the VC teacher needed to already be well-versed in it within a face-to-face classroom or be given specific instruction and encouragement to implement this pedagogy.

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Similarly, Lai and Pratt (2009) found that without adequate professional development, most VC teachers initially resorted to a teacher-centered style of teaching. However, if the teachers received training in the capabilities and constraints of the VC technology, they were better able to understand how the use of the technology would affect pedagogy and teaching styles. Furthermore, when the VC suite was equipped with an interactive white board, alternative new pedagogies were involved. In his study of post-secondary students, Dawson (2010) suggested that interactive white boards allowed teachers to provide enhanced VC lectures and interactive lessons between sites. Mitchell et al. (2010) noted that successful VC teachers working with secondary school students used the interactive white board to “bring focus to key parts of the lesson” (p. 472).

In their RACOL report, Varnhagen and Fuchs (2004) recommended that VC teachers continue to meet to discuss new teaching strategies, review videos of their lessons, and explore how the technology could enhance their VC courses. They expressed concern that, without ongoing professional development, teachers would revert to traditional teaching methods. They also suggested that a coordinator be hired to help teachers research VC pedagogies and develop new strategies with technology, because time constraints made such work difficult for teachers.

While VC teachers could check contact time, assignment submission times, and forum contacts if they used a learning management system in conjunction with VC, they could not easily look over the shoulders of students in order to check on students’ work, have quiet conversations to check for understanding, and spot-

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check homework. Nevertheless, it was necessary to provide frequent measures of, and ongoing feedback on, student achievement (Ferdig, Cavanaugh, Dipietro, Black & Dawson, 2009; Oliver, Osbourne & Brady, 2009; Owens, Hardcastle & Richardson, 2009; Rendon, 2001). The VC teacher needed to carefully plan the course and provide a variety of both formative and summative assessment opportunities in order to provide feedback. Feedback to students could range from informal verbal or written comments, to formal written reports about the students' work habits, behaviours, and achievement.

As well as assessing the student, Smith and Ragan (2005) noted it was important to evaluate components of the VC course, such as the teaching materials, assessment instruments, learning activities, types of interactivity, or instructional strategies. Unlike an online DE course, which was designed and created in its entirety before the course started, a VC course could be considered relatively flexible because it could be created and adapted as the course proceeded. Due to this flexibility, course evaluation for a VC course needed to be ongoing so that minor changes could occur while the course was being offered.

In addition to teaching and instructional design skills, VC teachers needed to be able to plan the course with the VC technology in mind. They needed to understand how the use of technology would change the delivery of their course, and adapt their teaching style and skills accordingly. As Simonson et al. (1999) explained, "it is the responsibility of the distance educator to design learning events that provide experiences with equal value for learners" (p. 71). VC teachers could fulfill this responsibility by providing a collection of experiences suitable for

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the prospective students. However, as noted earlier, because access to pertinent, up-to-date literature was limited, VC teachers were not always given adequate training to be able to create a suitable course.

Teaching strategies also needed to be adapted. For example, Lai and Pratt (2009) found that some teachers had difficulty dealing with the students at their local site simultaneously with students in remote schools. They therefore suggested that when devising the teaching strategies, VC teachers needed to plan how to divide their attention between all locations.

To aid student learning, Owens et al. (2009) recommended presenting learning material in more than one way. For example, teachers could follow a visual presentation via the interactive whiteboard or television with course material presented on the online course management system for students who preferred to print hard copies. They also advised that teachers needed to ensure that the learning materials were consistently designed and formatted. Similarly, Jakupak and Fishbaugh (1998) suggested that VC teachers ensure that the font size and layout of visual aids were sufficient for viewing in the receiving locations. Furthermore, teachers needed to check the accuracy of the reception of visuals with the students in the remote schools.

As stated earlier, the teacher's contribution to student learning was seen as being significant (Cohen, 2003; Lai & Pratt, 2009; Offir & Lev, 2000). Teachers needed to show enthusiasm for the subject, develop rapport with students, respond to student needs, provide feedback, and display humour when appropriate (Cuffman & MacRae, 1996). They needed to strive to create a learner-centered

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environment and encourage a high degree of interactivity and participation (Cohen, 2003). Teacher characteristics were also important. As Moore and Kearsley (2005) suggested, the most effective DE teachers were empathetic, had the ability to get to know their students through the technology, and provided opportunities for students to become actively involved in their own learning through interaction with the content, the instructor, and other learners.

VC teachers need to develop a pedagogically sound course, encourage participant interactions, manage the implementation of the course, and use the necessary technology (Cohen, 2003). To this list of DE-related abilities, Moore and Kearsley (2005) added teaching, attending to student progress, providing learner support, and evaluating course effectiveness to the duties of the VC teacher. In order to fulfill this broad range of responsibilities, VC teachers needed to be organized and thorough (Banister et al., 2015; Moore and Kearsley, 2005). Teaching a highly interactive course, and providing timely and frequent feedback, increases the teacher workload (Cohen, 2003; Kuo, 2005). Thus, teachers needed to be highly motivated to teach via VC, and have supportive administration, reliable technology, and adequate preparation time. Deek, Deek, and Friedman (1999) further stated that the process of creating and implementing a new DE course was more work, but once the initial work was done, the load was lighter when teaching the same course a second time. Barter (2013) found that some teachers reported that teaching a single VC course was a lighter workload than teaching a multi-grade or multi-course classroom, as often happens in small rural schools.

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On a practical level, Moore and Kearsley (2005, pp.145-146) suggested the following four techniques for successful VC teaching: (1) humanize the contact by using students' names and asking for personal experiences and opinions; (2) develop a variety of methods to ensure a high level of interaction and dialogue such as questioning, problem-solving, and making presentations; (3) develop clear communication techniques including print materials, overviews, and summaries; and (4) collect information from the students to provide regular feedback on their progress.

In order to promote interaction, Cohen (2003) and Peterson (2004) suggested using students' names, and sharing personal and content-related information. MacIntosh (2001) reported that students felt more connection when the teacher called them by name and recognized their voices. Teachers also needed to invite specific students from different sites into the discussions in order to encourage participation from all sites (Jakupak & Fishbaugh, 1998). Ensuring that all students feel they are an integral part of the class is not always easy to attain. As Zhou, Varnhagen, Sears, Kasprzak, and Shervey (2007) noted, "a learning community was difficult to initiate and even more difficult to maintain in an online learning environment" (p.16). However, in a study comparing student experiences in different online graduate courses, Varnhagen, Wilson, Krupa, Kasprzak, and Hunting (2005) noted that it was important to match course content and instructional method (teacher presence), as well as develop relationships among students (social presence), in order to develop student understanding and critical thinking in higher education (cognitive presence).

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Interaction is essential to student success in a VC course. Students who feel connected to the other course participants were more likely to complete the course (Rovai, 2002). Moore and Kearsley (2005) outlined the importance of interaction between the student and the teacher, other students, and course content. Thus, in order to increase student success, the teacher should utilize instructional methods and activities that promote student interaction.

It can therefore be seen that it was important that VC teachers considered the impact of the technology when designing and implementing a VC course. It was equally important that teachers created a student-centered VC course in order to maximize student satisfaction.

Novice Teacher Experience

Even though generic teaching competencies could be applied to VC, there were also specialized skills related specifically to the technology and distance aspects of VC, which teachers also needed to develop (Mitchell et al., 2010). As such, the experience of being a novice VC teacher could be compared to being a novice teacher because new skills need to be learned. In their study of novice teachers, Fantilli and McDougall (2009) found two areas of concern: ample time to prepare before and during the first teaching assignment, and lack of quality mentorship.

Lack of time and the resulting stress were evident themes in a number of studies. Flores (2001) found that new teachers in Portugal described their first teaching assignment as “sudden, stressful, and tiring” (p. 139). In describing the lived experience of new online instructors, Conceicao (2006) found that increased

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work intensity was one of the main themes that emerged. She described work intensity as both the length and depth of engagement required to successfully implement an online course for the first time.

Mentorship was the main focus of a study by Smith and Ingersoll (2004), which compared new teachers with mentors and those without. They described mentoring as one method of new teacher induction and defined it as “the personal guidance provided, usually by seasoned veterans, to beginning teachers in schools” (p. 683). They reported that mentorship affected both teacher attitudes, such as “job satisfaction, efficacy and commitment” (p. 683), and teacher retention, both to the school as well as to the teaching profession. They pointed out that some teacher turnover was healthy as new ideas are brought to the school and profession, but too much turnover could destabilize the school community or profession. Smith and Ingersoll further commented that “high rates of teacher turnover can inhibit the development and maintenance of a learning community; in turn, lack of community in a school may have a negative impact on teacher retention, thus creating a vicious cycle” (p. 686-687).

Flores (2001) identified the lack of both formal induction activities for new teachers as well as informal support by experienced teachers as concerns for novice teacher development. She suggested that a collaborative approach to curriculum implementation would benefit new teachers. She also suggested that new teachers be provided with ample time to learn to reflect and build a professional identity because professional learning should be ongoing throughout their teaching career.

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In a study of teachers becoming online teachers, Bennett and Lockyer (2004) found that there were changes to teaching practice activities and roles, such as the following: process facilitator, advisor-counselor, assessor, researcher, content facilitator, designer, technologist, manager-administrator. They demonstrated that both on-campus and online teachers participated in all of these activities, but that the pattern of when the activities occurred was different. They concluded that the same teaching principles apply in both situations, but online teaching involved an additional layer of complexity.

Not only concerns and challenges were present in new teaching or new DE teaching. In her study of the lived experience of online instructors, Conceicao (2006) found a second major theme, which was the reward of a stimulating new learning experience for the teacher. Barter (2013) also found that VC teachers enjoyed the challenge of learning something new. Parkes et al. (2011) further outlined the professional growth of the teacher in the areas of pedagogy and technology as benefits of teaching a blended home economics course in a New Zealand secondary school. However, they also commented that the teacher needed to be willing to engage in professional development to achieve this benefit.

In her study of new teachers, Flores (2001) found that personal experience as a student influenced the thinking and practices of new teachers. Because use of the VC classroom is relatively new, it was likely that few VC teachers would have experience as a VC student. Documenting the experience of the VC teachers could therefore aid understanding of the role.

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Summary

Montgomerie and King (2012) reported that VC does not make a difference to instruction unless it is adequately supported in a number of areas: technical expertise is available, curriculum experts to assist teachers, leadership to enable integration of VC, professional development for teachers, and support funding. Several of the studies found three main uses for VC within a school district: direct delivery of course content (mostly in rural and remote settings), administrative tool for meetings and professional development, and for content enrichment within the face-to-face classroom (Anderson, 2008; Anderson & Rourke, 2005; Montgomerie & King, 2012).

Similar to face-to-face instruction, VC instruction is synchronous but it is important to remember that they are not identical experiences and teachers must adapt their pedagogy when creating a VC course. It is necessary for VC teachers to consider the impact that the technology will have on the delivery of the course material and alter instructional activities so that students in all locations have a similar experience. Teachers need support to identify and make the changes necessary to deliver a VC course successfully.

VC teachers must be able to develop a pedagogically sound course. Face-to-face classroom teachers transitioning to teaching a VC course tend to maintain their teaching style when teaching a VC course unless they receive specific instruction on implementing new pedagogies. Without professional development, teachers often will develop a teacher-centered VC classroom.

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Because the teacher impact on student learning is significant, it is important that VC teachers are able to develop positive relationships with students in their home school as well as in the remote locations. VC students who feel connected with the teacher and other students in the course are more likely to be successful.

Anderson and Rourke (2005) summarized the keys to a successful program as: adequate training and support for teachers, liberal access to VC technology, and the simplicity of operation. Montgomerie and King (2012) further supported this statement by indicating that VC teachers needed informal (engaging with their peers through VC, especially access to advanced VC users) and formal (such as 2Learn.ca or provided by the school district) opportunities in order to develop the necessary VC teaching skills.

In some ways, becoming a VC teacher can be viewed as being a novice teacher again. Creating a VC course is a tremendous amount of work and new VC teachers need time to prepare and the support of a mentor.

Prior personal and professional experience help shape the kind of VC teacher a face-to-face teacher will become. It is therefore useful for teachers and administrators to be aware of the teacher qualities that were perceived as necessary to developing a successful VC course. These qualities, together with the positive experiences and the challenges in VC teaching are the focus of the study documented here. The following chapter will describe and discuss the methodology and context of this study.

CHAPTER III

THEORETICAL FRAMEWORK AND RESEARCH METHODOLOGY

A case study research using qualitative methodology was selected for the study in order to investigate the following research questions:

- 1) What positive experiences were gained by participating teachers from teaching a VC course? How were these experiences useful and/or enjoyable?
- 2) What challenges were experienced by participating teachers when teaching a VC course? How were these challenges overcome or addressed?
- 3) What personal attributes, skills, and/or talents were perceived by participating teachers as contributing to success as a VC teacher?

Research Design

The research design for this study was an intrinsic case study approach within a qualitative study methodology. Creswell (2007) identified three types of case studies: intrinsic, which concentrates on a single case because it is unusual or unique; instrumental, which focuses on an issue; and collective, which can be either of the former two but includes multiple cases. Stake (1995) suggested that an intrinsic case study is suitable for a situation where the researcher wants, or needs, to learn about a particular case, rather than to learn about an abstract construct or to build theory. In this case the researcher, as a VC teacher and support person, had a personal desire to learn more about the qualities of VC teachers as well as the benefits and challenges of being a VC teacher in this school district. The probability of high staff turnover combined with the lack of

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organized professional development could result in a decline in the quality of the rural VC program within this school district.

The purpose of a case study is to gain deeper understanding by generating an in-depth description of a case, a group of cases, or a bounded system (Creswell, 2007). This case study utilized Yin's (1989) single-case (embedded) design. The single case is defined as the collective experience, including both affect and actions, and the personal and professional qualities of the VC teachers in this school district. The embedded units are pieces of the stories of the individual VC teachers in the school district. The results of the study used the experiences of the individual teachers to develop a description of the collective experience of the teachers.

An intrinsic case study resembles a narrative study (Creswell, 2007) and, often, the case is selected for its uniqueness (Creswell, 2007; Stake, 1995). However, the results of a study selected for its uniqueness do not transfer to other populations (Stake, 1995). The intended result of this study was an increased understanding of VC teachers in this one school district. As such, it is understood that the results would not necessarily reflect other teaching situations in this, or other, school districts.

Philosophical Assumptions of Qualitative Research

This qualitative study takes the ontological assumption that the world is comprised of multiple realities, which are embraced and reported (Creswell, 2007). Each teacher experiences a unique reality in his/her own classroom. Being a teacher in one classroom, virtual or face-to-face, does not enable one to know the

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experience of another teacher in a different classroom. However, by interviewing many teachers in one type of classroom situation, such as the VC classroom, it is possible to gather some common experiences that may represent some commonalities within that particular situation.

Furthermore, the general structure of this study was social constructivist-interpretivist. It relied on the participants' views of the situation in order to inductively develop a pattern of meaning (Creswell, 2007; Creswell, 2009). The desired outcome of this study was a rich and deep account of the experience of the VC teacher, including both the positive experiences and the challenges, and a list of perceived VC teacher qualities. This description is best illustrated by the words and phrases used by the VC teachers themselves. Teachers' self-perceptions were used to create the list of perceived teacher qualities.

Purpose of the Study

The purpose of this case study was to develop an in-depth description and analysis of the case defined as the collective experience, including both the affect and actions of the positive experiences and challenges, as well as the professional and personal qualities of the VC teachers in one school district. The areas of consideration were as follows: (1) the positive experiences resulting from teaching a VC course; (2) the challenges encountered when teaching a VC course; and (3) the personal and professional qualities VC teachers attribute to their success.

Structure of the Study

Data were collected using a questionnaire provided to participants as an email attachment (see Appendix B) and through semi-structured individual

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interviews (see Appendix C) conducted on the phone or online using a real time voice connection. As the researcher was also a rural VC teacher, care was taken to avoid the possibility of researcher personal experience interfering with the discussion, analysis, and interpretation of the data collected.

The interview protocol was followed as closely as possible in order to keep the researcher and participants on topic. When questioning a participant further about a topic, the researcher attempted to summarize the participant's comments succinctly, without adding to them. During the analysis and interpretation processes, the researcher carefully omitted any personal thoughts and opinions that were not directly stated by the participants.

Once approval was received from the Athabasca University Research Ethics Board and permission to conduct the study was granted by the Superintendent of Schools, a list of potential participants was created. Using the rural school timetables for 2009-2012, the researcher identified 13 teachers assigned to teach a VC course in a rural school. One of those teachers had left the school district to teach elsewhere and was removed from the invitation list. The researcher was also removed from the list. The principals of the 11 remaining teachers were informed of the study and the teachers were invited by email to participate in the study.

When engaging in a phenomenological study, researchers often employ bracketing in an attempt to set aside their own experiences and view the data with a neutral perspective (Creswell, 2007). The researcher for this study used her experience as a rural VC teacher to select key points from the literature review to

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develop questions for the pre-interview questionnaire and interview. Additionally, she used her practical knowledge of teaching a VC course to group the codes and identify themes within the data. However, during the interviews she did not offer her own opinions or make comments on her own experience.

The invitees were asked to indicate their willingness to participate in the study by returning a signed consent form (see Appendix D). If no response from individual teachers had been received after one week, the initial email was resent with ‘just checking again’ in the subject line. If there was no response within one week of sending the second email, a ‘no’ response was assumed.

Six teachers indicated their interest by returning the consent form through email. While the researcher knew all of the participants through the rural VC system, none of them taught in the same school as she did. See Table 1 below for a profile of the participants.

Table 1. Participant Profile

Participant	1	2	3	4	5	6
Gender	Male	Male	Female	Female	Male	Female
Number of degrees	2	2	3	2	“Continu- -ing”	2
Years teaching	3	8	23	2	No response	5
DE student experience	None	None	Online compon- ent in Masters program	Paper correspo ndence	None	None
Number of VC courses taught	2	1	1	1	1	1
Number of VC semesters taught	3	2	1	1	3	1
Entered VC by	Invited by Principal	Invited by Principal	Invited by Principal	Applied for position	Invited by Principal	Applied for position

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Once the two-week response period was completed and it was determined that there would be only six participants, the pre-interview questionnaire (see Appendix B) was administered as a Word™ document via email. Each questionnaire was custom-created with an individualized participant code so that the document did not contain the participant's name. Five of the participants created their responses on the computer, while the sixth response was completed by hand and scanned into the computer. The participants all chose to return the questionnaires by email: two were attached as a Word™ document, and four were sent as PDF files.

Once all of the pre-interview questionnaires were returned, the interview protocol was sent out, again individually, with a list of possible interview times. Participants were offered the option of using Skype™ or telephone for the interview and informed that it would be recorded for analysis. For the four participants who chose to be interviewed by phone, a telephone with a speaker option was used in order to record the conversation on a computer using Apple™ GarageBand. The two interviews completed through Skype™ were also recorded on a computer. In order to guard against the possibility of failure of the recording equipment, the researcher also took notes on paper.

As far as is known by the researcher, only the participant and the researcher were present at each interview. The researcher opened with an introduction that included confirming that the participant had signed a consent form, reminding the participant that he/she may stop the interview at any time, and providing a brief explanation of the study. The researcher endeavoured to set a

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positive tone within a relaxed atmosphere, keep the discussion focused on the interview questions, ask probing questions, and ensure that the participant had an opportunity to contribute his/her own information at the end. At the end of the interview, the researcher thanked the participant and offered the opportunity to see the written results when they were completed and available to the public. The length of the six interviews varied in length: 10, 14, 19, 21, 23, and 38 minutes. This resulted in a total of 125 minutes of interview time.

Instrumentation

The six participants in this study each completed a questionnaire (see Appendix B) before participating in an individual interview. Some of the questions for the pre-interview questionnaire were designed to provide background information on the participants while others were created to solicit the participants' opinions on information gathered by the researcher during the literature review. As an experienced rural VC teacher, the researcher used points from the literature she thought key to developing a description of the experience of a rural VC teacher in this school district to develop the questions. Similarly, the interview questions were developed to gather the best information to develop a general description of the experience of a rural VC teacher.

Both the questionnaire and interview protocol (see Appendix C) were created prior to the start of the study but the responses to the questionnaire were collated into a single working document prior to the commencement of the interviews to ensure that the interview protocol adequately covered the topics raised by the participants in their questionnaire responses. No changes were made

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to the interview protocol used with each of the participants. The questionnaire included general questions about the topics as listed in List 1 below.

List 1. Questionnaire topics

- Participant education
 - Teaching experience (both generally and as a VC teacher)
 - Experience with distance education (both as a student and teacher)
 - How and why they became a VC teacher
 - Technology use in their personal life and the VC classroom
 - Their view of the personal attributes, skills, and talents important to being a successful VC teacher
 - Their view of the teaching skills necessary to being a successful VC teacher
 - What they liked about teaching a VC course
 - The frustrations of being a VC teacher
 - How well the learning outcomes of their course(s) adapt to the VC environment
 - The support they received from the school district, administrators and other staff as well as the support they would have liked to have had
 - Information that they found useful in planning their VC course as well as what would have been useful
-

List 2. Interview topics

- The participants' positive experiences in teaching a VC course and how those experiences differ from their traditional classroom teaching experiences
 - Their most satisfying experiences within their VC classroom
 - Their most difficult or challenging experiences teaching a VC course and how these were overcome
 - How successful they felt as a VC teacher and which aspects of the experience they felt helped them to be successful
 - What they would like to change to be more successful
 - The ways that they were supported as a VC teacher and the support they need to be a better VC teacher
 - Would they teach another VC course if given the opportunity
-

The interview focused on asking for information relating to the aforementioned topic areas in addition to asking the participants to relate both

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positive and challenging experiences they had encountered when teaching a VC course. The topics covered during the interview are given in List 2 above .

Data Analysis Procedures

In an intrinsic case study the most important goal is to understand the case (Stake, 1995). This goal is achieved by directly interpreting the situations described by the participants and by aggregating categorical data, with the most time spent on the former (Stake, 1995). In this study, once the interviews were concluded, the recordings were transcribed using HyperTRANSCRIBETM. This process resulted in a total of 48 pages of transcription.

After the transcription was completed, the process of analyzing the qualitative data using HyperRESEARCHTM began with a search for patterns and correspondence, defined by Stake as “consistency within certain conditions” (p. 78). The unit of analysis for the transcripts was a paragraph, which, for the purpose of this study, was defined as: uninterrupted speech by the participant. For the purpose of this study, a participant’s paragraph began when the interviewer stopped talking and ended when the interviewer made another comment.

An initial coding of all six interviews yielded a preliminary set of codes. However, further research on coding resulted in the researcher’s dissatisfaction with the quality of the initial interview transcripts. Speech patterns that included such things as pauses, laughs, and “uhm”s had not been entered into the transcripts. Therefore, the initial coding was removed and the transcripts in HyperTRANSCRIPTTM were reviewed. Once the missing speech patterns were added, the coding process for each interview transcript was conducted again using

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HyperRESEARCH™. This process yielded a more comprehensive second list of codes and theme groupings.

This set of codes was then reviewed for items that were similar, but were coded with slightly different names. These duplicated codes were then collapsed under one code name. During this process, more items that needed to be coded were found. Once this process was completed, the list of code names was reviewed and grouped into themes according to similarity. The transcripts were then reviewed again with the intent of looking at the groups of themed codes as a whole to ensure consistency. During this final review process, additional codes were eliminated by combining them with others until the list of codes and themes seemed representative of the information in the interviews without being too cumbersome in quantity.

After the aforementioned coding process was complete, the researcher enlisted the service of a co-coder. This person was a teacher from another school district who volunteered to act in this capacity for the study. As co-coder, she read the coded interview transcript and discussed codes and themes with the researcher. The co-coder did not know any of the participants and there was nothing in the transcripts that would identify individual teachers or schools. The co-coder was not a VC teacher, however, she did have experience both as a DE student and a DE teacher. An advantage of the co-coder's broader experience was that the VC teaching experiences articulated by participants were more objectively located within the broader DE spectrum.

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The researcher and co-coder met to discuss the steps that had been taken during the coding process and to review the codes and themes identified by the researcher. The coded interview transcripts, without participant identification, were given to the co-coder for review. Upon finishing an initial transcript review, the co-coder suggested further combining some codes, adding some new codes, and adding coding in some additional areas. With these comments in mind, the interview transcripts were revisited by researcher, addressing the items identified by the co-coder and then, once again, looking for duplicated codes and ensuring consistency within the theme groupings. When this revision was completed, the revised code list and interview transcripts were given to the co-coder for a second review. When the co-coder finished with her second review, the researcher reviewed the coding for a third time. This process resulted in the set of codes and themes presented in Chapter 4: Results.

Strategies for Validating Findings

Creswell (2009) outlined many ways a researcher can validate research results and suggested that several techniques be employed to ensure validity. The result of this study is a rich, thick description of the collective experiences of six rural VC teachers within one school district. It is not expected that this description will apply to other VC systems within or outside of this school district. However, even given the individuality of this case, it was still important to ensure that the information presented here accurately portrayed the situation and the information gathered. Outlined below are four of Creswell's suggested strategies that were used to strengthen the description of this study.

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Firstly, the researcher in this study was an employee and rural VC teacher within the school district. At the time that the interviews were conducted, she was the “rural VC coordinator”. This role was created, with no special compensation or time given, to support rural VC teachers. Duties for this district role included the following: liaising with the VC equipment technologist about the calendar rotation of classes; providing administration with the amount of teacher release time needed for travel to remote schools; maintaining a resource list for the VC courses; maintaining a contact list for the rural schools; administering the district VC Moodle™ site; and providing support to VC teachers. Every effort has been made, in the analysis and discussion provided here, to exclude the personal experiences and opinions of the researcher.

Secondly, all results, even those that were negative or contrary to the prior expectations of the researcher, were reported. The intent of this study was to develop a clear and accurate picture of the collective experiences of the VC teachers in this particular school district. A literature review was used to identify broad categories of interest, but the details of the interviews provided the final topics of concern and details of the description.

Thirdly, the experiences of the VC teachers included in the study have been written with rich detail. The description is the result of both questionnaires and interviews with six participants of varying teaching experiences, both in and out of the VC system. The demographics and biographies of the participants varied greatly. This has provided as much information and detail about the VC teachers’ experience as is needed for the reader to picture the situation accurately.

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Finally, in keeping with Cresswell's (2007) recommendation, a co-coder was used to increase reliability. The volunteer for this position was a teacher from another school district who had no experience with VC, but some experience with DE. The co-coder did not know and was not able to identify any of the participants or their school from the transcripts. The researcher completed several rounds of coding and checking before outlining both the process and results for the co-coder. The transcripts and results were then turned over to the co-coder to review in-depth and provide feedback.

Narrative Structure of the Study

This single-case study is being reported as a single narrative of the collective experience teaching a VC course in this school district. This collective experience is supported by examples from individual VC teaching experiences as long as anonymity could be assured. The structure of the narrative has been grouped into the themes that emerged from the analysis of data from the questionnaire and interviews.

Role of the Researcher

Stake (1995) outlines many roles that the researcher can take in case study research but teacher and advocate are the ones that apply to this study. The aim of this study was to describe the experience of teaching a rural VC course. Providing information to others could result in a better understanding of the VC classroom by district and school administrators, face-to-face and VC teacher colleagues, students, and parents.

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As teaching a VC course is not an experience that many administrators and teachers have had, they do not know what skills or attributes VC teachers need to be successful or how to support them. By using the findings of this study to educate administrators and other teachers, the researcher will be able to advocate for VC teachers in this school district regarding the challenges that emerged from the questionnaires and the interviews.

The researcher, also a rural VC teacher and support person within the school district, is working on this project as part of a Master's program. Prior to the study, the researcher had known each of the participants through working in VC, but did not know them personally and had never worked closely with them. Every effort was made by the researcher to not include personal experiences and opinions in the results. The interview protocol was followed and, when questioning a participant further about a topic, the researcher attempted to summarize the participants' comments without adding to them. During the analysis and interpretation processes, the researcher carefully omitted any personal thoughts and opinions that were not directly stated by the participants. In order to reduce researcher bias it was necessary to ensure that no personal experiences were related to the participants during the interviews or included in the common experience during the writing stage. While the personal experience of the researcher made objectivity more difficult, at the same time, it also helped facilitate the framing of interview questions, assigning of data codes, and development of a list of common themes.

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Use of a Co-coder

As recommended by Cresswell (2007), a co-coder was used to increase reliability. The co-coder was a teacher from outside of the school district who had access to the raw data and the researcher's initial coding. She met with the researcher several times to make suggestions for coding changes and fine tune the final list of codes.

Study Delimitations and Limitations

Delimitations.

This study focused on one particular school district in British Columbia. The participants were self-selected from a group of 11 rural teachers assigned a VC course within the time period 2009-2012. The participants' experience with teaching a VC course ranged from teaching the same VC course three times to teaching only one VC course. This breadth of experience offers insight into a range of VC teacher experiences at several different stages of professional development as a VC teacher.

The school district in this study had three VC systems that had the capacity to interconnect but operated as one rural and two urban systems. The urban systems were different from the rural system in a number of areas and were not within the scope of this study and, therefore, no further detail was provided on them.

Limitations.

A limitation of this study is the number of participants. Only six rural VC teachers agreed to participate. The small number of participants and the selection

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of case study as a methodology will not allow the findings of this research to transfer to other populations. However, the study may provide the teachers and administrators of this particular school district with some valuable information about the experience of rural VC teachers. Furthermore, since there is relatively little research on teaching VC courses at the secondary school level, this study may create interest in conducting research about secondary school VC systems or about teaching courses through VC to secondary school students.

Ethical Considerations

Permission to conduct the research was granted by the Athabasca University Research Ethics Board (see Appendix A) after submission of the appropriate forms and procedures. The school district did not require ethics approval, but permission was requested from, and granted by, the Superintendent of Schools (see Appendix E). As a courtesy, the principals of the schools where the potential participants were currently teaching were informed (see Appendix F) before the VC teachers were invited to participate (see Appendix G). The participants were asked to give informed consent before the study commenced (see Appendix D).

The study participants were assured that the researcher would maintain confidentiality. The participants were assured of their anonymity throughout the process of gathering the data in the questionnaire and interview and during the coding process. Each participant was given a code number, which appears in all research documents available to the co-coder. There was only one document, available only to the researcher, which has both their name and code number.

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Participants' names, schools, and course names were not included in the transcripts or study report, to ensure the participants' anonymity.

All paper and computer files will be stored in a locked cabinet or in password-protected files for five years after the completion of the research. At that time, the paper files will be shredded and the computer files will be deleted.

Research participants were assured that they could withdraw from the study at any time; however, none chose this option. The teachers in this school district who have chosen to teach a rural VC course have indicated that they are willing to try new experiences just by being involved in the VC system. Therefore, it was not surprising that they were willing to also participate in creating a description of the experience of the rural VC teacher within the school district and identify possible teacher attributes that contribute to a teaching a successful VC course. The results of the study are presented in the following chapter.

CHAPTER IV

RESULTS

As noted in the previous chapter, the participants completed both a Pre-Interview questionnaire and an individual interview. The questionnaire concentrated on participants' education and teaching experiences as well as their opinions on the skills and attributes that they considered important to be a successful VC teacher. The interview focused on stories from the participants' experiences as VC teachers. These stories were revealed through discussion of the positive experiences of teaching a VC course, the challenges of teaching a VC course, and the perceived skills and attributes needed to be a successful VC teacher.

PRE-INTERVIEW QUESTIONNAIRE

The pre-interview questionnaire provided background information on the rural VC teachers as well as their opinions on some VC topics. Three males and three females participated in this study. The participants cited many personal and professional attributes that they considered important to their success as VC teachers. The following sections present the highlights from the pre-interview questionnaire.

Education

Five of the six participants indicated that they had a Bachelor degree in their subject area as well as an Education degree. One of the five also had a Master of Education degree. The sixth participant indicated that his/her education was "continuing".

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Teaching experience

Participants represented a combination of experienced and novice VC teachers. Their teaching experience ranged from two to 20 years in the classroom and several had also worked as a teacher-on-call for up to three years before receiving full-time employment. They were trained or experienced in teaching a wide range of courses. However, the VC courses that they had taught included only the two disciplines of sciences and social studies.

At the time of the study, two participants were no longer teaching a VC course as they had left their rural schools to teach in urban schools in the same school district. These participants mentioned that they felt their information in regards to technology might be “dated” because of the length of time that they had been away from the VC classroom and the speed with which technology changes. After the study interviews were completed, another participant moved to an urban school.

The six participants listed a variety of teachable subject areas. Some they were trained to teach and others they had learned to teach by teaching the course, thereby making it a teachable subject for that participant within this school district. All participants were teaching a VC course in their subject specialty so they had formal training in the subject area.

Experience with distance education

None of the six participants had experience teaching or being a student in a VC course prior becoming a rural VC teacher. Four participants had no experience

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with DE as a student but one had taken a Masters program with an online component and another had taken a paper-based DE course.

There was a small range of experience as a rural VC teacher. Three participants had taught a rural VC course once, one participant had taught one VC course twice and another had taught a VC course three times. The sixth participant had taught two VC courses: one course once and another course twice. See Table 2 for this information in another format.

Table 2. VC Teaching Experience

	020423	080313	730904	791224	811211	820427
Course one	twice	twice	once	once	3 times	once
Course two	once					

How and why they became a VC teacher

Participants cited only two reasons for getting into teaching a VC course: four participants were approached by their principal with the idea of teaching a VC course before it was included in the school timetable, and the remaining two participants had successfully applied for a position that included a VC course as part of the teaching assignment. Participants gave many positive reasons for why they agreed to teach a VC course including the opportunity to learn new technology, to expand their professional toolbox, to teach a course they enjoyed, and for a new experience. In addition, one participant agreed because of recognition that there was the need for VC to be successful in the rural schools and was asked by the district/principal to be the first rural VC support person as well as teach a VC course. Two participants noted they agreed to teach the VC course

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out of what they felt was obligation. They were seeking full-time, continuing employment within the school district and cited this as a reason for applying for a position within a rural school, which included a VC course.

Technology use

Prior to becoming a VC teacher, participants estimated that their personal use of technology per day was 1-3 hours for computer use, 1-2 hours for Internet use, and 1-2 hours for smart phones. Within the VC course all participants estimated that they used Bridgit™ and the front camera every day. The SmartBoard™ was used daily by five of the participants and 1-2 times a week by the sixth participant. Use of the more specialized equipment occurred less frequently. See Table 3 below for more information.

Table 3. Technology Use in the VC Course (in hours/week)

	020423	080313	730904	791224	811211	820427
SmartBoard™	Daily	Daily	Daily	Daily	Daily	1-2
Bridgit™	Daily	Daily	Daily	Daily	Daily	Daily
Front camera	3-4	Daily	Daily	Daily	Daily	Daily
Back camera	Daily	Daily	1-2	Don't have one	Never	N/A
Dvd player	1-2	Never	1-2	1-2	1-2	1-2
Moodle™	Daily	Daily	Never	Never	Daily	Daily
Internet for teaching	1-2	Daily	1-2	Daily	1-2	3-4
Student computers	1-2	Never	3-4	Daily	1-2	3-4

VC teacher personal attributes

In the questionnaire, participants were asked to rank the five personal attributes, skills and talents they felt were most important to VC teaching. From the list of 24 attributes, 12 were selected as being in the top five by at least one

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participant (see Table 4). It should be noted that one participant selected five attributes with an “x” and did not rank them. The information for this participant was used in the “top 5 column” but not in the “selecting it as 1 or 2” column.

Table 4. Top Five Personal Attributes Ranked by Participants

Attribute	Number of participants selecting it as in the top 5	Number of participants selecting it as 1 or 2
Has a positive attitude	2	1
Enthusiastic about the subject matter	4	1
Adaptable	2	1
Organized	5	1
Good communication skills	4	0
Innovative thinker	2	2
Comfortable with computer use	1	0
Comfortable with various forms of technology	4	2
Passionate about teaching	1	1
Willing to learn new skills	2	0
Engages students	2	1
Gets to know the students individually	1	0

The following attributes were not selected as the top five by any of the participants, but they were mentioned, or alluded to, during at least one interview: good sense of humour; timely and on time; willing to collaborate; creative; experience in theatre or performing arts; good decision-maker; and honesty. The following attributes were not mentioned by any participants: social person; ability to read emotions and empathize with people; reliable; ability to use social media such as Facebook™; and respect for others.

VC teacher teaching skills

In the questionnaire, participants were given a list of nine teaching skills, compiled from the readings for the literature review, that could contribute to successful teaching and asked to rank the five they felt were most important to VC

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teaching. At least one participant selected each of the nine options as within the top 5 for importance as shown in Table 5. Note that one participant selected five skills with an “x” and did not rank them. Again, the information for this participant was used in the “top 5 column” but not in the “selecting it as 1 or 2” column.

Table 5. Top Five Teaching Skills Ranked by Participants

Teaching skill	Number of participants selecting it as in the top 5	Number of participants selecting it as 1 or 2
Giving timely feedback to students	4	1
Using both formative and summative assessments	3	2
Having knowledge of the prescribed learning outcomes	3	2
Ability to use the SmartBoard™	1	0
Ability to use Moodle™	5	0
Balancing the focus given to each school	4	3
Making individual contact with all students	5	2
Willing to try new ideas for instruction	4	1
Other (skill not identified)	1	1

The positives of teaching a VC course

When asked what participants liked about teaching a VC course, there was range of responses including: the connection with the students, seeing students become more independent, using the technology and software, connecting with educators from other schools, and being able to offer courses to students who do not have the opportunity in their home school. See Table 6 below for teacher responses.

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Table 6. The Positives of Teaching a VC Course.

020423	<ul style="list-style-type: none"> - I like seeing students interact with other students from different locations. Give them a chance to get to know/make friends with people they may have never had the opportunity to meet. - I also love Moodle™. While it requires a lot of work getting your course set up, it is definitely worth it in the end. Provides structure and helps with pacing of the course. But also very easy to modify/change components if you choose.
080313	The biggest benefit to VC courses in my opinion is the difficulty for students to get one-on-one help with the teacher. In a senior Physics course it is important that students start to work through difficult problems without help. A VC course forces them to do this.
730904	<ul style="list-style-type: none"> - Connecting with passionate educators in other small schools - Working with students in their senior year, offering them a course option other than WEB CT (if it isn't in the regular timetable) - Expanded my 'horizons'
791224	<ul style="list-style-type: none"> - Students are, for the most part, quite enthusiastic about the course material - Can focus on course material rather than behavior management - Experimenting with technology and teaching
811211	Love the technology
820427	I like that courses can be offered because if VC did not exist, many students in rural areas or where interest in a particular school doesn't warrant the numbers for a class, the course would not be able to be taken for credit. Even though online courses are offered VC is closer to classroom instruction and allows students to ask questions and be taught in real time making it more personal than online.

The frustrations of teaching a VC course

The participants also listed many frustrations surrounding teaching a VC course. These frustrations included: the technology not always working properly, the difficulty of developing a relationship with students in the remote schools, not always knowing who to contact in the student's home school if there was a problem, balancing having students in four schools, communication with students, difficulty doing group activities, and the added burden of traveling to the remote schools. See Table 7 for a list of the frustrations expressed by the participants.

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Table 7. The Frustrations of Teaching a VC Course.

020423	<ul style="list-style-type: none"> - Smartboard™ can ‘act up’ at times (actually quite frequently); censor not the greatest despite reconfiguring it. - Delay in mics also limits quality of group discussions as people ‘trip’ over one another in trying to talk. Also takes longer for students to get to know one another so that they feel comfortable enough to talk. - It is harder to engage those students at off-site locations compared to those directly in front of you. - Lastly, knowing who to contact at other schools/being able to get in contact with them can be a challenge at times with certain schools. While some schools have a go-to VC contact, such as a teacher librarian, other schools don’t have staffing to provide adequate supervision on a regular basis for these tests/quizzes.
080313	<ul style="list-style-type: none"> - Technology issues; nine out of ten classes everything works great but a couple of times a year the connection is down and your class doesn’t work.
730904	<ul style="list-style-type: none"> - Challenges working with 4 different schools, interruptions to classes, lack of admin support in some jurisdictions - Technology not always working perfectly
791224	<ul style="list-style-type: none"> - Lack of contact with students - It can be difficult to read if a student understands the material as I teach. Consequently, I spend more time marking because I give more, smaller assignments to check for understanding. - Students lack of communication with me, especially if they are in another location. I find they are less likely to ask for help. Typically the student waits until his or her problem is much bigger than it needed to be before asking for help. - Again, this means that I ask to see a rough draft of an assignment multiple times, meaning, I am doing much more marking that I would otherwise.
811211	<ul style="list-style-type: none"> - Don’t like the limited personal time with students - Testing
820427	<ul style="list-style-type: none"> - The format of VC currently is not my favourite because it makes my particular teaching style very difficult to execute. I am very personal and enjoy conversations with students, it is very difficult to do this over VC as many times when students are working they need to leave the room or be far from the mic to use a computer etc. - I also enjoy many group activities and discussions, which can also be difficult due to VC technology because currently there is a slight lag in the internet time. - It is also very stressful for me to travel to all the schools several times a semester as I have to prepare for a TOC for my other classes. I understand this is necessary to gain a personal relationship with my students, but if I had the choice between teaching my course not VC I would. - I also find technology gives students excuses to not get their work in on time, and I am not able to keep them in etc if they do not hand in their work. - You have avenues and contacts at the other schools but it is still more difficult than if you see them everyday in person. - I think that better screening is needed when finding candidates for VC courses and they shouldn’t let just anyone take these courses.

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Adapting learning outcomes to the VC environment

All of the participants indicated that the learning outcomes for their VC course could easily be adapted to the VC environment. One participant pointed out that lab work was difficult but not impossible in a VC course.

Support

Participants mentioned that they received support from a number of sources: other VC teachers, their school administrators, the technology support person, the VC teacher support person, and the library assistants. They appreciated the support that they received for: starting and using the technology, booking the time to travel their remote schools, and the training on how to set up a Moodle™ course. The participants requested more training in using the technology and software, and support from school administration in the remote schools.

Before the VC course started participants found it helpful to be given instruction on: how to use the technology in their course, how to use Moodle™ in their course, who to contact with technical problems, and who to contact at each school with problems about a student. They would have liked to have even more training.

INTERVIEW

Coding Process

The final coding of the data from the questionnaires and interviews resulted in 417 items coded into 32 codes. These codes were sorted and grouped by similarity of topic into seven themes. The codes and themes are listed in Table 8 below. The theme and code names are meant to be somewhat descriptive,

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however the information gathered during the questionnaire and interview will be described in further detail below. Also included in Table 8 is the number of individual items listed under each code name and the number of interview transcripts where that code was used. This additional information indicates how often the participants commented on a topic and was interpreted as the relative importance of a particular point. There were only two codes, technology – necessity and teacher – awareness, that were mentioned by fewer than three participants.

Once the themes were established, the information from the questionnaire summary was reviewed and the items within it were sorted into the same seven themes. As such, the seven themes were a result of information gathered from both the questionnaires and the interviews and were used as the organizers for the discussion of results that follows.

As shown in Table 8, all of the themes contain several codes; however, the discussion of each theme varies according to the amount of information provided through the questionnaires and interviews. For themes 1 to 4 the amount of information gathered, together with the individuality of the topics, warranted a division of the discussion into several sections. However, less information and the relationship between the topics allowed themes 5 to 7 to be discussed in one section each.

As stated in the previous chapters, the outcome of the study was a rich and thick description of the collective experience of the VC teachers in one school

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Table 8. Interview Codes

Theme	Code names	Number of coded items	Number of interviews referencing the code
Teacher related	<ul style="list-style-type: none"> • VC teacher – learn new skills • VC teacher attributes • VC teacher feeling of success • VC teacher skills 	12 19 27 19	6 6 6 6
Technology	<ul style="list-style-type: none"> • Technology – evolution of • Technology – necessity • Technology – overwhelming • VC – influenced face-to-face courses 	19 3 6 9	5 2 3 4
Comparison to other types of instruction	<ul style="list-style-type: none"> • Teacher – self-awareness • Comparison – differences from face-to-face • Comparison – similar to face-to-face • Comparison to other modes of delivery • Problems – function of distance 	3 25 9 6 6	2 6 3 3 3
Information specific to VC	<ul style="list-style-type: none"> • VC – challenge to teach • VC – district support • VC – limitations • VC – pro d (professional development) • VC – pedagogy • VC – reason to/not to teach it • VC – support from other school staff 	5 37 11 20 13 11 13	4 6 4 4 4 5 4
Classroom management issues in VC	<ul style="list-style-type: none"> • Class composition • Classroom management – assessment • Classroom management – discipline • Classroom management – managing up to 4 schools • Classroom management – student engagement 	7 21 16 8 16	5 4 4 5 5
Developing relationships	<ul style="list-style-type: none"> • Relationships – developing across distance • Relationships – face-to-face meeting • Relationships – multi-site collaboration • VC – technology bridging distance 	31 5 6 10	6 3 3 3
Importance of VC courses to the school district	<ul style="list-style-type: none"> • Student – comments to teachers • VC – important to rural students • VC – raise profile as important courses 	7 11 6	3 3 3

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district. The description was developed using both the set of self-identified VC teacher skills and attributes, as well as the participants' experiences of teaching a VC course as derived from the questionnaires and interviews. In the remainder of this chapter, the results of this study are discussed according to the themes and codes listed in Table 8 above.

Theme 1 – Teacher Related

Learning new skills as a VC teacher. All six of the participants commented about being forced to learn new methods in teaching, either related to technology, teaching strategies, or both. In all cases, they indicated that the technology was new and, as one participant stated, “a little outside of my comfort zone.” However, while the technology was a challenge for all of the participants at first, one person noted “it’s not something that is constantly a challenge or a problem.” The VC teachers soon became accustomed to the technology within the VC classrooms. Furthermore, several participants claimed that they ultimately felt a sense of personal growth through mastering new technology.

A few of the participants cited the need to learn new technology as a positive experience and commented that this learning eventually affected the way they taught in their face-to-face classrooms. One participant summed it up with the following:

Since actually being familiarized with the Moodle™ as a result of VC and how easy it is to set up courses on a program like that, I have now started to do that for my other classes that aren't

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videoconferenced, just so that there is kind of like a home base for all of my classes.

Once the use of the technology was embraced, some of the teachers began to explore using it in ways that enhanced the VC classroom, rather than simply as a communication tool. For example, a participant commented:

In VC there's a certain amount of technology that's available to you that isn't necessarily in your regular classroom ... So I tried to take the attitude of instead of being frustrated by it, to come up with ways to use it that were more beneficial to the course ... and, hopefully, that would bring some more student engagement I've got a pretty good handle on choosing things that are actually going to be useful for me and the students, as opposed to just bells and whistles.

Feeling of success as a VC teacher. All of the participants reported feeling some degree of success as a VC teacher, as shown by the quotes below:

- 1) "I think I've been quite successful."
- 2) "I felt good. I thought the classes were quite successful."
- 3) "It was quite nerve-wracking."
- 4) "I feel fairly successful."
- 5) "I feel, in the classroom, my success depends mostly on the relationship I have with the children. But through VC I think it's a lot more academic so as long as my kids do well on their assignments and the exam then, cause I think it's more tied to student achievement. So I would say I'm middle of the pack."

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6) “I was not the most successful but I wasn’t failing.”

Not all the participants initially felt that the VC project within the school district would be successful, but several participants stated that they were pleasantly surprised. Generally the participants noted the success that they felt personally as well as the success they observed in the rural program as a whole. One participant did not feel as personally successful as he/she had hoped, but was optimistic that teaching future courses would bring more feelings of success because of recent training in VC and use of the SmartBoard™.

Many feelings of success from the participants appeared to stem from the relationships developed throughout the VC course. Several participants mentioned the positive relationships they had developed with their students and cited students from remote schools returning to visit after graduation as one of the highlights of teaching a VC course. Other participants discussed the relationship that developed between students from different locations as indicators of their success in the VC course. Participants outlined multi-site group presentations that their students had completed and commented on the success of these projects. They felt successful in creating a community of learners who were able to achieve their personal best, despite being in different geographic locations. A participant described this success in the following comment:

I think the first positive experience would be the fact that you could create a community of learners even though all the learners were not in one physical setting. And that was a huge highlight and something

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I had striven for and so, when I really felt that it had been achieved, I took a lot of pride in that.

Some participants felt that they had achieved success in their VC course because their students were academically successful. A few of the teachers also commented that they had received feedback that their students had enjoyed the course.

Future goals for their VC career/course. Two participants were no longer teaching VC courses as they had relocated away from the rural schools, but all the participants who were currently teaching a VC course had specific goals for that course. One participant wanted to increase student collaboration between sites as well as to increase the engagement of students at the remote locations. This teacher mentioned the strategy of creating opportunities for students at all locations to get to know each other earlier in the course in order to increase student comfort level around working with students at other sites. A couple of participants mentioned using the Moodle™ LMS and the SmartBoard™ more fully, such as connecting with guest speakers and using virtual tours. Another participant mentioned exploring ways to use the technology in more innovative ways as well as adapting teaching strategies and style to make the VC course more like a face-to-face course including developing relationships with the remote site students and ensuring students were engaged in learning tasks.

While several participants outlined goals for their VC course, only one commented on the future of their teaching career, saying “Honestly, I hope that in the far future I will not be teaching VC as, currently, it is not my favourite. But I

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am also very new to it and inexperienced. I just feel it will never be the same as a regular classroom and is not my first preference.”

Theme 2 – Technology use

Within the rural VC system, a district technologist controlled the video connection between the schools, so all of the VC suites were automatically connected at the beginning of the period and disconnected at the end of the period. VC classes occurred daily. Each teacher was required to create a Bridgit™ connection through the Internet in order to be able to use the SmartBoard™ each class.

Evolution of the technology. As stated earlier, two of the participants were no longer teaching a VC course; however, they both offered a great deal of pertinent information about many of the themes within this study. They both recognized that their comments about technology were dated because of the time that had elapsed since they were in the VC classroom and the speed with which technology evolves. Both participants commented on the unreliability of the technology and losing class time when the connection between the classrooms was not working adequately; however, while the participants who were currently teaching VC courses did comment on the technology sometimes not functioning properly, they also expressed great relief and gratitude for the speed with which their concerns were dealt due to the efforts of the dedicated technology specialist provided by the school district.

At least one participant commented that the first time through a VC course, the technology was used simply as a connection or communication tool. Most

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participants recognized that the school district had invested a great deal of money in the technology in the VC classroom and that most teachers did not have access to this technology in a regular classroom. Some of the more recent VC teachers commented that they spent a great deal of time researching ways to use the technology available to them as teaching tools rather than as “bells and whistles.” A few participants commented that they explored ways of using technology for effective ways to enhance learning (e.g., multi-site projects) and to provide timely feedback (e.g., using a GoogleDrive™ application to comment on student work as it is developed). Another participant commented that recent training had provided many new ideas for teaching future VC courses.

Necessity of the technology. While not many participants commented on the necessity of technology to VC, one participant stated that “without technology, VC wouldn’t happen.” Several of the participants saw the need to make use of the technology beyond its obvious use as a connection and communication tool between the schools. Several participants were also working to use the technology to enhance the teaching and learning within their VC course.

Sometimes the technology is overwhelming. Not all participants expressed frustration with the technology but many stated that the technology was overwhelming at the start of their first VC course. A participant stated about learning the technology, “It’s a big challenge off the start, but once you have it down, it’s not something that is constantly a challenge or a problem.” Participants experienced a steep learning curve in the beginning of their VC experience, as described by one participant in the excerpt below.

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I remember my first year of VC I had a couple sheets of paper that were always in the front of my binder with the kind of laundry list of instructions as far as how to set up Bridgit™ and make sure that the cameras were set up and it had the phone number at the district office if there was any problems and all that, and coming back the second year even, I remember furiously hurrying around trying to flip through my binders and books because I thought I had misplaced that information and even, stepping away, having taught it the first semester the one year, not teaching it the second semester and having the summer off ... I realized that I had to re-teach myself some of the things cause I had forgotten and it had been a while since I had used them. I'm happy to say that in year 3, it wasn't like that.

More than one participant commented on deliberately working to change his/her attitude and rather than having feelings of frustration with the technology to be more positive and search for ways to use technology to benefit the VC course. One participant summed it up saying, "Sometimes it was frustrating, so I tried to take the attitude of instead of being frustrated by it [the technology], to come up with ways to use it that were more beneficial to the course."

Influence of VC course on face-to-face courses. Several participants mentioned feeling so successful using the technology in their VC course that they expanded implementation of that same technology into their face-to-face courses. For example, most participants had not developed a website before being asked to

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create one for their VC course; however, they found it so successful that they began using a website to organize their face-to-face courses as well.

After teaching one VC course, a participant participated in a SmartBoard™ training course and noted that it offered ideas for both VC and face-to-face courses. Another participant commented that much of the technology used in the VC course was also helpful in face-to-face courses, and was now considering the idea of using the SmartBoard™ in a face-to-face course for special events as an optional activity.

Theme 3 – Comparison to other types of teaching

All of the participants discussed the differences between teaching a VC course and a face-to-face course at some point in the interviews. Several participants also made other comparisons to teaching a VC course. Table 9 below outlines the comments made by the participants and the number of participants who made each comment. Each of the items is discussed more fully below.

Teacher self-awareness. One participant commented that it took time to become used to seeing oneself on the television screen. This participant noted it is different from looking in a mirror as the teacher becomes aware of his/her physical appearance and the mannerisms that the students see. Another teacher mentioned a need for self-awareness because a good VC teacher needs to be attentive to the use of the camera during the instruction and student work time. It was suggested that it would be useful to have a conversation with the students at the beginning of a course to get their preference for seeing the teacher or the other students during instruction.

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Table 9. Theme 3 Topics

Item	Comment by participant	Number of participants
Teacher self-awareness	Teachers are unaccustomed to seeing themselves on the television.	1
	Teachers need to identify student preference for front or back camera for lesson and work times.	1
How VC is different from face-to-face	There is more technology and it is more advanced in the VC suites.	5
	Necessary to select pedagogy to bridge the distance with students in remote schools.	4
	Laboratory courses were more difficult.	1
	The distance between teacher and students encouraged more independent problem solving in students.	1
	Developing relationships with students is more difficult over distance.	6
	Teachers had to be more tolerant and more creative when gathering assignments from students in remote schools.	3
	Test security was a concern.	2
	Teachers are unable to directly monitor the activities that the students are doing.	5
	Teachers needed to be more organized.	4
	Students needed to be more mature as learners.	3
How VC is similar to face-to-face	Good teachers in face-to-face use the same skills for VC.	1
	VC teachers need to be strong classroom managers.	2
	VC teachers need to be able to adapt quickly when a lesson is not being successful.	3
	VC courses prepare students as well as face-to-face courses.	2
	Teachers felt that both VC and face-to-face courses are better alternatives than online courses.	3

How VC is different from face-to-face teaching. The participants commented on many ways that a VC course is different from a face-to-face

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classroom. All of the participants recognized that the technology in the VC classrooms was often far more extensive than what was available in the regular face-to-face classroom. The variety of technology made it easier to incorporate the use of technology within their lessons. They also recognized that it was necessary to use the technology in new ways in order to bridge the distance between the teacher and the students at other sites.

Several participants commented that they needed to alter their pedagogy to accommodate the limitations created by the distance between schools within the VC environment. One participant, new to both VC and the particular course being taught, had been assigned to a mentor teacher with experience teaching the course in a face-to-face classroom but not as a VC course. The participant noted that not all of the suggestions for the face-to-face classroom from the mentor teacher would work in the VC course. Another participant mentioned that it was difficult to teach a laboratory course in the VC environment and give the students a similar experience to that in a face-to-face course. Yet another participant commented that a positive aspect of altering pedagogy for VC was that students were able to become more independent learners with more peer mentorship occurring in the remote schools, where the teacher was not physically present.

Several participants mentioned that developing relationships through VC was more difficult than in a face-to-face course. The image on the television and the sound were not very clear and it was difficult to read facial expressions or hear voice nuances. Teachers also commented that it was difficult to build a relationship when they had no prior knowledge of students from other schools

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before they came to the course. Similarly, the students from other schools had no prior knowledge of the VC teacher. The rural schools in this district are small and often the teacher and students at a particular school have developed a relationship before the VC course through previous face-to-face courses, extra-curricular activities, and the like. This prior familiarity was missing for VC students at remote schools where the teacher was not situated. Developing a relationship among students from different locations through VC was even more difficult than between the teacher and students because there was no opportunity for them to interact outside of the course. Several teachers commented that they purposefully designed opportunities for students from different schools to interact in VC course activities and found it quite successful in building peer relationships.

Participants also commented that gathering physical assignments for a VC course was more difficult than in the face-to-face classroom. The postal mail system between schools often took two weeks for delivery one way so teachers had to plan deadlines carefully. As a result, many teachers had moved to assigning work that could be submitted electronically. Participants reported that some students used technology mishaps as an excuse to hand in late work.

Participants also reported difficulty ensuring that students understood the directions for assignments in VC courses, and that students in remote locations seemed reluctant to ask for clarification. As a result, some participants created checkpoints with mandatory submission of early drafts to ensure that students were fulfilling the requirements of the assignment well before submission of the final draft.

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A few participants also expressed concern over the security of tests for VC courses. Most tests were sent via email to the remote school for the students to pick up at the office, write in the VC classroom, and then return to the office. The VC teacher had little control over what happened to the tests in the remote schools and how the tests were administered. Several participants mentioned that they were moving to projects for assessment rather than using tests for student assessment.

The physical distance between the schools also created other issues. One participant commented that using technology to connect the schools allowed some students to “tune out” and VC teachers needed to be constantly checking in with the students in all locations throughout the class. The participants also felt that dealing with discipline in a multi-site course was more cumbersome. Teachers often needed to report incidents to the student’s home school and let someone at that location deal with the problem and administer a consequence rather than being able to adequately deal with the incident within the VC classroom. Teachers who were accustomed to using physical proximity (e.g. one participant expressed the desire to be able to circulate during a test and offer little hints if a student was struggling) to change a student’s behaviour were unable to use this technique in the VC course. Several participants reported the need to be particularly organized when teaching a VC course, and commented that there was less flexibility in VC course delivery because materials needed to be in place at all locations before a course activity could be implemented. Several participants commented that delivering a VC course was more work than a face-to-face course because of the

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need to plan ahead and alter activities to suit the VC environment. One participant commented that VC students needed to be aware of the differences between a VC course and a face-to-face course and to alter their expectations and behaviour accordingly. Because there is not a teacher physically in the remote classroom, students in a VC course often need to be self-motivated and disciplined. They need to take responsibility for their own learning and at least one participant felt that not all students are suited for this.

Several participants felt that VC courses were not as good as face-to-face courses. Participants listed difficulties developing a relationship with students in the remote schools because of the distance and the limitations of the technology (television screen quality and the delay in the sound), as well as the limitations of the technology on pedagogy. One participant felt that, while it was best for rural students to take face-to-face courses and, when this was not possible, a VC course was a better alternative than an online or a correspondence course. However, one participant remarked several times during the interview that the school district was “doing it right” in the implementation of the rural VC program. Overall, when VC teachers focused on attempting to provide a similar experience for all students, the participants felt that VC courses and face-to-face courses were equally as able to prepare students for a post-secondary education.

How VC is similar to face-to-face teaching. One participant felt that the basic skills needed to be a face-to-face teacher and a VC teacher were the same, but that the difference pertained to the use of technology, as indicated in the following statement: “Things that make a strong teacher are going to make a

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strong VC teacher. There's different tools that you have to use." Another participant commented that VC teachers must exude an inner strength and demonstrate course knowledge in order to quickly gain the trust of the VC students, just as they need to do with students in a face-to-face course. Similar to face-to-face teachers, VC teachers must be able to recognize lessons or assignments that are difficult for students and make adaptations to promote better understanding.

Theme 4 – VC pedagogy

Table 10. Theme 4 Topics

Topic	Comment	Number of participants
Challenge of teaching through VC	Whole group activities were more difficult	3
	Easier to present information in person	1
	Difficulty reading facial expressions and body language	4
	Difficult to have a private conversation	1
	Difficult to give extra help to students	5
	Support needed from the students' home schools	2
	Interruptions from remote schools cause disruptions	2
Professional development needed for VC	Technology	5
	Pedagogy	4
Considerations for VC pedagogy	Camera use and teacher positioning	4
	Multi-site presentations by students	1
	Good preparation needed	4
	Mandatory check-ins for large assignments	1
Support for teaching VC	Training on the technology	2
	Assistance of the rural VC support person	3
	Time provided to travel to remote schools	2
	Discussions with other VC teachers in the school	1
	School librarians and other support people	1
Support for planning the VC course	Individual instruction on the technology	3

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Participants said that they liked interacting with, and getting to know, students from other schools. Several participants indicated that they liked the opportunity to learn new technology. A couple of participants stated that it was important for the school district to support and ensure the availability of VC courses because these courses provide an important service to students in rural schools. Table 10 above outlines the comments made by the participants and the number of participants who expressed each comment. More discussion of the topics follows the table.

The challenge of teaching through VC. Several participants reported that whole group activities and student discussions were more difficult in a VC course than in a face-to-face course. The delay in microphone communications was disconcerting for students. Also, students were reluctant to engage in discussions when they did not know each other very well and, as noted earlier, it was more difficult for students to get to know each other in a VC course setting.

One participant pointed out that some information was more easily presented in person than via VC, especially if the teacher was using a manipulative in a demonstration. Video transmission also made reading facial expressions and body language more difficult and required them to conduct more frequent verbal checks for understanding. Participants found it difficult to check for understanding during the lessons. Students also had difficulty reading the teacher's non-verbal cues as well. The remote school visits were considered very important for helping the teachers and students more accurately interpret each other's communications.

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Some participants reported having limited personal or private communications with their students in a VC course. Individual conversations with students in a remote school either had to be conducted during class time in front of the other students in the VC class, or a few minutes after the class was dismissed and before the video connection was cut off. Some participants commented that they were unable to offer the extra help at lunch time in a VC course, as they usually did in a face-to-face course. So far, they had been unable to find an alternative means of supporting students who needed extra help in the VC course. One teacher commented that with VC it was impossible to peer over students' shoulders during a test to ensure that they were on the right track or to point out an error and suggest that the student rethink the answer. Participants commented that in a VC course, students' difficulties often became extreme before help was sought from the teacher. VC teachers made an effort to support the students, but did not always know the most appropriate person to contact at the home school for arranging additional student support.

Working with as many as four different schools in a VC course created a unique set of problems. While the timetable and school calendars were aligned for the rural schools, special events at particular schools often created interruptions to VC classes. The involvement of several schools in the VC course multiplied the number of interruptions and often left few students available to participate in regular VC course activity. Participants felt that administrators at the rural schools did not always prioritize the VC course and or provide adequate support.

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As part of a VC course, teachers were required to make two visits to each remote school and teach a class from that location in order to build relationships. Participants reported that some VC teachers found this requirement stressful, as the distance between schools was often quite large, sometimes requiring a full day to travel between the schools. As a result, VC teachers needed to be absent from their other classes for up to six days each semester in order to meet the requirement to travel to the remote schools.

Professional development specific to VC. The participants identified a need for professional development in two main areas: technology and pedagogy. Several participants commented that it was important to use the VC technology to enhance pedagogy rather than simply as a communication tool. For example, they wanted to learn to use the SmartBoard™ as more than a white board, and desired instruction on how to use technology to enhance pedagogy, such as offering virtual field trips or bringing presenters from outside the school district to all locations simultaneously. Teachers also wanted to learn how to use technology applications such as Googledocs™ to help students create, collaborate, and share their work. Participants recognized the importance of developing a course website using Moodle™ for communicating with their students, but wanted instruction on how to build the website before starting their first VC course.

One participant, who took a five-day course on use of the SmartBoard™ after the first year of teaching a VC course, wished that the training had been received before starting the first VC course. A couple of participants felt that VC training should be mandatory before teaching a VC course. Several participants

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commented that they were required to discover instructional strategies for VC on their own, and expressed a desire for more professional development specific to VC in rural schools. Interestingly, they preferred that professional development be done in person rather than through VC. Participants remarked that even conversations with other VC teachers would be helpful to gain new ideas. They felt that there were lots of great things that could be done with students through VC, but that they did not have the knowledge, skill, or time necessary to plan and implement these ideas.

VC pedagogy. One participant commented that confident use of technology and good pedagogy were important for developing trust with students. When asked specifically about pedagogy, the participants identified two areas specific to VC: camera use and multi-site presentations by students. They mentioned the importance of teacher positioning and proper use of the camera(s) to create a comfortable learning environment for VC students. Participants indicated that students liked to both hear and see the teacher. One participant who used multi-site student presentations in his/her VC course was especially pleased with the results when students from different schools were required to work together. To create a successful learning community, this participant felt that it was important for the VC teacher to set up situations that required students to interact with the whole class and not just with the students at their home school.

Participants mentioned other pedagogy-related areas that were applicable to both VC and non-VC courses. They noted that good preparation was necessary, and that it was important to have a backup plan in case of technology failure, even

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for a short period of time. Participants also mentioned offering students the option of doing a presentation instead of a final exam, and instituting mandatory check-ins for big assignments.

Most of the participants felt that the prescribed learning outcomes for their VC courses could be adequately met through a VC delivery. One participant commented that teaching oral speaking skills and presentation skills was difficult, but not impossible, through VC.

Support for teaching VC. Participants listed several areas of support provided by the school district, including the following: professional development on Bridgit™, SmartBoard™ and Moodle™; the assistance of the rural VC support person; the support of the technology person; and the allocation of time to travel to the remote schools. However, the professional development for VC teachers provided by the school district was considered inconsistent as it ranged from an optional one-day workshop for some VC teachers to a quick informal introduction for others. The rural VC support person was available to help with the logistics of travelling to the remote schools or arranging student field trips, as well as answering questions throughout the semester. The school district not only provided release time for teachers to travel to teach the lesson from each remote school twice in the semester, but also insisted that these face-to-face lessons occurred between VC teachers and the students in remote schools.

One participant acknowledged the help received from other VC teachers within their school. More experienced VC teachers often spent time with beginning VC teachers, discussing ideas that had worked in their courses and

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making suggestions for improvements. Another participant was grateful for the support of the school librarians to select and suggest resources for the VC course. One participant commented that non-VC teachers did not always understand the need for consistency within the timetable to better accommodate the VC courses. This participant commented, “Some people want to flip timetables, change blocks, shorten blocks, and not realizing the impact it had and maybe it was only on four students in your school, but it impacted a whole class of VC and I found that very frustrating.” Another concern was that the non-VC teaching staff in rural schools did not always recognize the importance of the rural VC program because only a few students in their school were enrolled in these courses. They did not realize that a few students in four schools resulted in a full class that was often more work to manage than a traditional face-to-face classroom course.

One participant suggested that having administrators regularly check in on the VC students in their schools would help the VC teachers manage the course. Participants noted that emails were not always answered and it sometimes took a great deal of effort to get a response from a student, parent, and/or the home school. One participant, who taught in a school with a very small VC suite, suggested that a room change would make teaching the course much easier, stating “We’re going to change the whole library around just to suit VC....the point was so I could see the kids on the computers.”

Planning the VC course. Participants commented that the individual instruction they received on the use of Moodle™ and the technology in the VC room was a helpful preparation for their first VC course. However, they would

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have liked even more information about Moodle™, the SmartBoard™, and the other technology available to them as they proceeded throughout their first VC course.

One participant found it very useful to meet with the previous teacher of the VC course to discuss assignments that worked in the VC setting. The participants found it reassuring to know that there was a rural VC support worker and a list of contacts at each school. However, many of the participants felt that they had taught themselves, often through trial and error, the skills necessary to teach a successful VC course.

Theme 5 – Classroom management issues in VC

Table 11 below outlines the comments made by the participants with regard to management issues in VC and the number of participants who made each comment. Classroom management becomes more complicated when the students are not in the same room as the teacher, as is the case in VC courses. One participant commented that VC teachers must be strong and confident in order to handle the distance within the VC classroom. These requirements are true for teachers in a face-to-face classroom as well, but are magnified in a VC course.

Table 11. Theme 5 Topics

Comment topic	Number of participants
Strength and confidence are needed to teach over distance	4
Dealing with discipline is different than in face-to-face	5
Giving student support is more difficult	5
Organizing up to four schools	3
Difficulty maintaining student engagement	3

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Most of the participants commented that dealing with discipline was different, by necessity, in a VC course. It was often delayed because most teachers were reluctant to discipline a student in front of the class so it was necessary to contact the home school later. Some concerns that participants raised included the following: students leaving class without permission, students not attending class, not being able to visually monitor what the students were working on, and students frequently muting the microphone to talk about topics not related to the course. Some participants expressed frustration at not being able to keep students in at lunch time when homework was not completed and their inability to use physical proximity to correct inappropriate behaviours during a lesson.

Participants felt that the most difficult part of dealing with up to four schools was the special events or sports team activities that occurred in a single school, which pulled some of the students away from class. In these instances, the VC teacher needed to decide whether to continue with the lesson because only part of the class was away or to give an optional assignment because only part of the class remained.

Several participants commented that they made a conscious effort to pull students from remote locations into the lesson activities so that everyone felt they were an important and contributing part of the class. However, the VC teachers had less control when students were sent to work elsewhere, sometimes to an adjoining room with computers, so the teacher had to trust that students were working on the assignment given.

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One participant expressed the belief that it was necessary to have charisma in order to connect with the students and keep them engaged. Maintaining student engagement was recognized as necessary to avoid many management issues. Another participant remarked on the unusual capacity for students to “check out” within the VC course. Students in remote schools were able to appear to be working when they were not, and the only way the teacher could check was to ask the students what they were doing. In addition, the graduation ceremonies in schools were listed as a concern, especially to second semester VC courses because rural schools celebrate graduation on different weekends. It was possible that a VC course could be affected by as many as four graduation ceremonies within the span of a month causing students to be distracted and/or absent.

One participant expressed the desire for rural schools to screen students before placing them into a VC course to ensure they were able to seek help when needed and to successfully work independently, as these attributes are required in VC courses. This recommendation was supported by the observation of another participant who remarked that when the remote locations had strong students, the students were more responsive to the teacher during class. They were also more likely to ask clarifying questions and request help.

In most cases, participants tried to conduct assessments in the VC course as they had done in their face-to-face classes. Although they felt less confident about using tests and quizzes as there was no direct supervision in the remote VC classrooms, many participants continued to use these assessment tools. Teachers also felt that they had to be more lenient with assignment deadlines, often

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accepting late work. Due to the difficulty of getting assignments and the need to accept late work, VC teachers often struggled to provide timely feedback to students. Moreover, as they lacked the ability to keep students in at lunch time to catch up on late work, VC teachers also found it difficult to encourage students to complete the assigned work. However, participants noted that the use of the course website was a good tool for helping students become more independent and maintain the course schedule.

Theme 6 – Developing relationships

Table 12 below outlines the comments made by the participants with regard to relationship development and the number of participants who made each comment.

All of the participants commented on the importance of developing a relationship with students for successful teaching. They also commented on how much more difficult it was to develop a relationship with the students in the remote

Table 12. Theme 6 Topics

Comment	Number of participants
Building relationships, teacher to student and student to student, is important	6
More difficult to develop a relationship with students in a VC classroom	6
Visits to remote schools are important	3
Important to use technology and applications to bridge the distance	4
The relationships with the students was a positive of the VC teaching experience	2

schools. Participants felt the face-to-face visits to the remote schools were vital to developing the teacher-student relationship. However, because the visits were comparatively infrequent, participants felt that using technology wisely was also

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necessary to bridge the distance between schools. Using programs such as Googledocs™ and allowing students to submit work in different formats helped students gain confidence and trust in the teacher. One participant observed the following: “The use of things like Googledocs™ where you can actually have students at different locations working together in group assignments where, again using that technology, it gives students a chance to bridge that gap.” Another participant commented, “I hope that the trust that I developed with the kids was ... because I learned to use the technology, new teaching strategies that I was, hopefully, using those effectively and that’s what gave them the trust in me.”

Multi-site collaboration of students was identified as the most satisfying experience for one participant, but another participant commented that it was an area needing improvement. Most participants saw this type of student-student relationship building as important to the success of the VC course, however, not all students liked multi-site collaboration. In some cases, multi-site work needed to be promoted as another type of problem solving to be learned by students. One participant noted, "Students would sometimes complain to me about having to work, say multi-site, and my response back to them was this is a new type of problem solving set of skills that you’re probably going to need in your life, just because of how much we use technology for communicating now.”

All of the participants cited getting to know students from other schools as a positive experience in teaching a VC course. They were also pleased to note that many of the students developed relationships with students in other schools. Many teachers encouraged interaction between sites in order to promote trust within the

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community of learners. For several teachers, these student-teacher relationships continued after the course was concluded with former students returning to visit.

Theme 7 – Importance of VC courses to the school district

Three of the participants expressed the belief that VC courses were very important to rural students. One participant mentioned that VC was an opportunity for rural schools to offer courses to senior students that would not otherwise be available in small schools. In some cases, the VC program helped to prevent the loss of rural students to urban schools. One teacher commented that, although VC was seen as a disadvantage by some members of the school community, it was actually an advantage because of what the program brought to the school. One of these advantages was sharing teacher expertise between rural schools as evidenced by one participant who stated the following: “It was so extraordinary for [the students] to work with teachers at other schools who had expertise that we didn’t have at our school They were able to get those courses at their rural school and did not have to take them by correspondence or WebCT™.”

One participant mentioned that the role of the rural VC support person was created in order to raise the profile of the VC courses for both the rural schools and their students. Initially, during development of the VC program, one of the support person’s responsibilities was to ensure that school staff and administrators recognized the importance of the VC courses. Even so, one participant mentioned that some teachers found the idea of teaching a VC course quite negative. Furthermore, at times, even the VC teachers did not always place much priority on their VC course. One participant mentioned that other VC teachers did not see the

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importance of doing professional development activities for their VC course when they only taught one VC course per year.

Participants felt that the students enjoyed their VC courses. A couple of participants mentioned that students returned on breaks from university to visit and comment positively about their VC course experience. One participant had requested feedback at the end of the course and received positive feedback from the students at the home and the remote schools. The only student complaint mentioned by participants was that students were reluctant to work on projects with students from other sites.

Summary

The data gathered from both the pre-interview questionnaires and the interviews was blended and organized into seven themes. Teachers commented on the personal attributes and teacher skills that contributed to their success in their VC course, the use of technology in the VC course and the influence it had on their face-to-face classes, how the experience of teaching in a VC classroom compared to other types of teaching, specific considerations for teaching through VC, classroom management issues in a VC course, relationships, and the importance of VC courses for the rural schools in this school district. These themes provided the basis of the description of the experience of being a VC teacher in this school district, which is discussed in more detail in the next chapter.

CHAPTER V

DISCUSSION

As presented in the previous chapter, the study yielded two main outcomes in relation to the research questions, namely a set of self-identified VC teacher attributes, and an in-depth description of the VC teaching experience in a rural secondary school district. The list of attributes includes both personal and professional skills. The description includes both the positive experiences and the challenges encountered when teaching a VC course, and represents the compilation of experiences of all of the participants.

This chapter will use the three research questions to frame the discussion of the data, using a section for each: the positive experiences of teaching a VC course, the challenges of teaching a VC course, and the attributes that contribute to successful VC teaching.

Positive experiences of teaching a VC course.

Learning to use the technology effectively in the classroom seemed to be a point of pride for most of the participants. Using new technology was one area that VC teachers brought from their VC courses into their face-to-face classrooms. This finding fits well with the recommendation of Owens et al. (2009) to present learning material in more than one way. Participants mentioned that using Moodle™ allowed less organized students to easily access course materials multiple times, if necessary, and allowed students access from home if they were absent from class. This idea was quickly applied in the face-to-face classroom

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once it was used in the VC course. Improvement in their face-to-face courses was often cited as one of the successes associated with being a VC teacher.

As mentioned in Chapter IV, the teaching experience of the participants in the classroom ranged from two to 20 years. None of the participants had any experience learning through VC and only one had any kind of a distance learning experience. As well, none of the participants had experience teaching through VC or formal training in teaching distance education courses prior to their first VC course with the district. At the time of the study, the experience of the participants as a VC teacher ranged from teaching one course once to teaching one course three times. Only one participant had taught more than one subject through VC.

Long standing teachers seemed to view their VC experience more positively than new teachers. At the time of the study, the rural VC program had just completed its eighth year of implementation. The participants who had been teaching VC courses from the beginning of the VC program were also experienced in their teaching area. Similarly, the participants with the most recent experience teaching a VC course were not only new to VC, but also relatively new to the teaching profession. In addition, some of these newer teachers had not taught the course in a face-to-face situation prior to being required to teach it via VC. These newer teachers were the participants who expressed the most dissatisfaction with teaching a VC course. As one new teacher commented, “You really have to be forthright in your commitment to be a teacher and really believe in yourself that you can to do this.” Teachers with prior experience teaching a course face-to-face felt more confident taking that course into the VC program; for example, one

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participant noted that a teacher was twice as apprehensive teaching via VC if it was also the first time teaching the course in any format.

All of the participants felt successful in their VC course, some more than others. Most often, the feelings of success appeared to stem from the relationships the teachers developed with students from other schools. One participant commented, “My success depends mostly on the relationship I have with the children,” and another expressed similar sentiments saying there was satisfaction in, “having the kids contact me after the course was finished. They felt enough of a connection to this person who was, in some cases ... 200 kilometers away.”

The participants felt these relationships contributed both to student learning as well as teacher satisfaction. Feeling a sense of pride was also mentioned, for example, when students developed relationships with students from other schools, thus contributing to the community of learners that the teacher was striving for. Furthermore, participants felt that, in most cases, the students were academically successful. One participant considered the VC course a success because “they passed, all of them, and that they learned, that they were willing to learn.”

Some participants felt that strong face-to-face teachers had the skills to be strong VC teachers because the basic skills were the same. Other participants commented that it was important that VC teachers were stronger and more secure in their abilities than face-to-face teachers. Most participants valued the opportunity to learn the skills needed to teach a VC course and many felt that the rural VC program was valuable to providing more opportunity to the rural students than they would otherwise have. Furthermore, the VC program enables the rural

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schools to share the expertise within their buildings. Staffing within the rural schools has dropped to such low numbers that not all schools can have teachers trained in all of the subject areas. Through VC, the expertise at one rural school can benefit all of the others, as noted by one participant “It was so extraordinary for (the students) to work with teachers at other schools who had expertise that we didn’t have at our school.” Another participant expressed the belief that it was best for rural students to experience face-to-face courses whenever possible but that taking a VC course was better than taking an online course to get the credit needed. “I have always believed that face-to-face teaching was the best, videoconferencing second, WebCT™ third, and then correspondence fourth, if you were in a rural school.”

One participant expressed the belief that a successful VC teacher uses the technology confidently and employs good pedagogy in order to develop trust with students. In a VC classroom, this means using teacher positioning and camera use to create a comfortable learning environment for VC students. As in any course, they felt that good preparation was important including an alternate activity plan in case technology is not working.

All of the participants commented that they were appreciative of the pre-training that they received, but it should be noted that this training was not consistent from person-to-person. Some participants felt that training should be mandatory before starting with a VC course and the teacher should be supported during the first VC course. The participants felt that even just the opportunity to meet with other VC teachers would be helpful. Interestingly, one of the

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participants asked that professional development be offered face-to-face even though the support was for teaching a VC course.

The participants were grateful for the support provided by the district, including: professional development on Bridgit™, SmartBoard™ and Moodle™; assistance of the rural VC support person; support of the technology person; support of the school librarians; and time to travel to the remote schools. Some also commented on the informal support they received from other VC teachers, but felt that meeting with the previous VC teacher for their course would have been helpful. In addition, they mentioned that it would have been helpful if the administration visited the classroom from time to time to help set the tone and credibility of the VC course.

The participants' concerns about professional development concentrated on two areas: a desire to be thoroughly trained in the use of the technology and the necessity of learning how to adapt face-to-face instructional pedagogy to fit the VC classroom. While participants felt completely supported with technology before starting to teach a VC course, they indicated a desire to learn more advanced ways to use technology as they progressed throughout their VC career. Conversely, the participants did not feel supported in the area of pedagogy and teaching via VC. They noted that they quickly recognized that their face-to-face lessons needed to be adapted for VC but felt as one participant commented: "I was discovering those instructional strategies on my own."

The most experienced VC teachers asserted that the rural VC program was very important for preparing students in the rural schools for post-secondary

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programs. The rural VC program allows the rural schools to share teacher expertise and provide a wider range of courses to senior students. It was mentioned that, even though the program is heavily supported at the district level with resources such as: a full-time technology support person, a part-time VC support person, teacher-on-call and mileage to enable travel between schools, and the technology within the VC classrooms, not all school administration and staff members recognize the importance of these courses or this program.

As for teaching skills, one participant summed it up with “Once you get the technology, there’s things that make a strong teacher that are going to make a strong VC teacher.” More specifically, the participants noted that the ability to use the technology to bridge the distance was important, as was the need to establish a relationship with the students in remote schools and develop activities that gave all students the same learning experience, despite their location.

Challenges of teaching a VC course.

Long standing teachers seemed to view their VC experience more positively than new teachers. At the time of the study, the rural VC program had just completed its eighth year of implementation. The participants who had been teaching VC courses from the beginning of the VC program were also experienced in their teaching area. Similarly, the participants with the most recent experience teaching a VC course were not only new to VC, but also relatively new to the teaching profession. In addition, some of these newer teachers had not taught the course in a face-to-face situation prior to being required to teach it via VC. These newer teachers were the participants who expressed the most dissatisfaction with

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teaching a VC course. As one new teacher commented, “You really have to be forthright in your commitment to be a teacher and really believe in yourself that you can do this.” Teachers with prior experience teaching a course face-to-face felt more confident taking that course into the VC program; for example, one participant noted that a teacher was twice as apprehensive teaching via VC if it was also the first time teaching the course in any format.

When asked about future goals for teaching VC courses, the two most inexperienced participants responded that they hoped not to teach a VC course again, mentioning how difficult it was to teach a VC course as compared to a face-to-face course. One stated, “I really, really like the face-to-face relational aspect of a traditional classroom and I’m quite social and a social learner ... I found it really difficult in videoconference to try to make that work for me.” While these participants felt that they had been somewhat successful teaching via VC, they felt more confident of achieving success in their face-to-face courses. Even so, these teachers still identified areas of their VC course they would work on improving if they did teach via VC again. The future goals, shown in Table 13 below, that were outlined by all the participants still teaching a VC course included the following: increase student collaboration between locations; increase the engagement of students at remote locations; explore the use of both Moodle™ and SmartBoard™ more fully; and adapt both teaching strategies and style to make the VC course more like a face-to-face course. Two participants were no longer working in the rural schools and as such were no longer teaching a VC course so did not have any suggestions for future improvement.

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Table 13. Goals Identified by Participants for Future VC Courses

Future Goals
Increase student collaboration between locations
Increase the engagement of students at remote locations
Explore the use of both Moodle™ and SmartBoard™ more fully
Adapt both teaching strategies and style to make the VC course more like a face-to-face course

The identification of goals indicated that participants were reflecting on the success of their VC course and its various parts. This is in keeping with the comment by Smith and Ragan (2005), that it is important for teachers to evaluate the components of their VC course and make improvements as needed.

Many participants commented on the steep learning curve associated with the technology used in the VC classroom. They also expressed gratitude for the quick support provided by the VC technologist when things did not go well or they were unsure of how to use a piece of technology. As one participant stated, “When you call him, your course is important and you are going to get his attention... I could call him while I’m teaching and he could help me, for the most part, right then.” The participants who no longer taught VC courses both commented on the unreliability of the Internet connection between schools; however, this issue appeared to have been resolved at the time of the study because the participants who were currently teaching a VC course reported few technology malfunctions.

The participants’ use of technology varied a great deal, both personally and professionally. Based on the participants’ comments, it appeared that it was more important that a VC teacher was willing to learn to use the technology than how much they had previously used it personally or in their face-to-face classroom. Dawson (2010) and Mitchell et al. (2010) suggested that successful VC teachers

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use the equipment to enhance their lessons. Participants' comments indicated their increasingly effective use of technology as there seemed to be a change in technology use by participants over time within their VC course. In the beginning, technology was primarily used as a connection tool to link the four classrooms together into one. But over time, as the teachers researched the use of the technology and pedagogy, they tried to use the technology to improve the delivery of the course material and provide feedback to students. One participant who had completed a week-long professional development workshop specific to the SmartBoard™ and was also thrilled to discover Googledocs™ commented as follows:

[The workshop] was very useful. And the Googledocs™ thing. Now, I thought to myself last year when I was teaching [my VC course] ... 'what if I want a kid in [one location] to work on a project with a kid in [another location]?' And now I can, but I couldn't before, well maybe I could have, but I didn't know about it.

Based on the participants' discussion of camera use for the best lesson delivery and indications that they had started exploring the use of technology to enhance pedagogy, it seemed that they were becoming more confident with the technology. As one participant noted,

Little things in my first year about which camera you have on you when you are teaching a lesson and hearing that there's a preference for that kind of stuff ... and now every semester that conversation is had at the start.

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This comment is supported by the need to optimize the use of the equipment in a VC course, which was mentioned as important by Cuffman and MacRae (1996), Doggett (2008), and Mitchell et al. (2010). Several participants expressed interest in further training in many areas of the technology.

Although there was more technology involved in a VC classroom than in a face-to-face classroom, that alone could not bridge the distance within the classroom. Participants realized that they had to alter their pedagogy in order to offer the same course to all locations. For example, one participant noted:

I learned a lot in the last four days at that conference that I went to. Man, that would have been nice to have last year ... the use of things like Googledocs™ where you can actually have students at different locations working together in group assignments where, again using that technology, it gives students a chance to bridge that gap.

One participant also observed that some lessons, such as laboratory work, could not be done as easily via VC, stating: “it ended up being amore theoretical course than what my regular classroom ones look like. The ability to do labs, experiments, projects was limited”. Some participants felt that the students in remote locations became more independent learners because the teacher was not at their location. Other participants felt that VC students needed to be carefully screened because it takes a mature student to be successful in a VC course. One participant stated, “I kind of always thought the screening processes as far as the students that are taking VC is something that schools should really look at.”

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Participants noted that it was more difficult to develop relationships in a VC course, but that those relationships were crucial to student success. The difficulties were in part a result of the poor quality picture and sound within the VC suite system, as well as the students and teachers having no knowledge or relationship before the course. One participant stated:

I was meeting kids for the first time, who I had never seen in the hallway and so that was a complete new experience, to not have a student come into my classroom and not know my name and me not know their name.

Teachers in small rural schools are often familiar with students before they teach them, due to the size of such schools. Developing a relationship between the VC teacher and students was acknowledged as being difficult, but participants felt that it was even more difficult for student-student relationships to develop. Participants felt the need to intentionally facilitate opportunities for these cross-school relationships to develop.

Participants commented that both the reluctance of students to speak in front of students they did not know and audio delay hindered class discussions. One participant commented: “delay in mics also limits quality of group discussions as people ‘trip’ over one another in trying to talk. Also takes longer for students to get to know one another so that they feel comfortable enough to talk.”

To help offset the delay of audio technology, Jakupak and Fishbaugh (1998) and MacIntosh (2001) suggested that VC teachers employ longer wait times after asking a question. Participants also noted that picture quality made reading facial expressions more difficult for both teachers and students. One

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participant noted, “You can’t see their facial expressions, really, so you don’t know if they’re getting you, so you have to just keep going and running with it.”

Participants noted body language nuances were difficult to read over VC.

Participants expressed frustration with not being able to have private time with students or provide one-on-one support for their course. Many of them mentioned, for example, that they used lunchtime for extra support for their face-to-face courses, but had not found a satisfactory alternative for their VC course. They found that students in their VC courses often let problems become very large, and seemingly insurmountable, before seeking help from the VC teacher.

On the theme of classroom management, the most commonly raised issues were the lack of private conversation time with students and the need to, at times, delay discipline. VC teachers sometimes had to delegate classroom discipline to someone within the student’s home school, leaving the VC teacher feeling as though he/she had lost credibility with the student. Similarly, participants were unable to check on student work during class time or to retain students at lunch if assigned work was incomplete.

VC teachers became very aware of their physical appearance and their body mannerisms when teaching. They noted quickly becoming aware of where to stand, which way to face and which camera to use to attempt to bridge the distance to the remote schools.

Participants felt that teaching a VC course was more work than a face-to-face course. As Deek et al. (1999) noted the process of creating and implementing a new DE course was more work. However, the workload lightened when the

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course was taught a second time. One participant credited relative youth to having the time and energy necessary to implement a VC course:

I am thinking someone older than myself, that has the added responsibility of family and children and all that kind of stuff, I don't know how enthusiastic they would be if asked to take a VC course because it does take time to get everything set up and learn the technology.

The extra work was compounded by the fact that the district required the VC teacher to travel to multiple schools throughout the semester. The travel took several hours, sometimes on roads that were covered with snow or ice. In addition, the VC teacher had to prepare lessons for another teacher to teach his/her non-VC classes while visiting other schools. While this travel was considered by participants to be important for the VC students, it was also a disruption for the face-to-face classes. One participant noted,

It is also very stressful for me to travel to all the schools several times a semester as I have to prepare for a TOC for my other classes. I understand this is necessary to gain a personal relationship with my students.

Despite the extra work that was created, visits to the remote schools were identified as very important to developing relationships with the students. All of the participants agreed that developing a good relationship with students was necessary in order for the course to be successful. The development of student-student relationships was also suggested as being important for students. However, they felt it was more difficult to develop both teacher-student and student-student relationships in a VC course than in a face-to-face course. One participant

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identified the following problem in the VC course: “I’d say just lack of getting to know the kids on a personal level.” Speaking about support from the school district, another participant acknowledged the following: “Giving some release time so I could go to the other schools and actually make face to face contact. That was really important to get that connections, to get to know what the kids actually look like.” The teacher visits to the remote schools were very important in establishing the teacher-student relationship and activities within the class were important to developing the student-student relationships. Another participant commented about changes to the course to encourage student participation, saying “What I need to work on is ... pulling from all four locations ... more activities within my classroom where the students can get to know each other better.” Providing timely feedback was also important to developing confidence and trust with the students. Participants also explored using technology as a way to try to bridge the distance between the students. Requiring multi-site collaboration for some assignments forced students to interact with students from other schools. While developing relationships was stressed as an important aspect of a VC classroom, the participants indicated they recognized they had few suggestions on how to achieve this and, for this reason, they suggested this as an area for further investigation.

Teaching students in another location created many logistical problems for the participants. They noted the need to become more creative with gathering assignments, and finding alternative methods of checking for student

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understanding, as well as to be more trusting in testing situations, and rely on a student's home school for some student discipline.

Several participants noted that there was some difficulty in adapting some successful teaching pedagogies used in the face-to-face classroom for use in the VC classroom. These participants found that they had to alter or replace some of the lessons and assignments that were previously used, as some information, such as the use of manipulatives in a laboratory demonstration, was more easily delivered in person.

Participants mentioned some changes made to their pedagogy for their VC course including instituting mandatory check-ins for large assignments to ensure students understood the expectations and offering students the option of completing a presentation instead of a final exam with the goal of avoiding ambiguous testing situations. Furthermore, the participants set up situations that enabled students to interact within the whole class and not just their home school, in order to create a successful learning community. All participants felt that, with pedagogical changes to delivery, the learning outcomes for their course could be adequately met through VC.

Several participants commented on the importance of the inner strength of a VC teacher. They saw the projection of strong leadership as an important attribute to keep the students engaged. Frequent disruptions interrupted the flow of the course and it was important that the VC teacher be able to pull the students together between the disruptions so that they could refocus and continue with their learning.

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Several participants mentioned that they attempted to assess VC students similarly to their face-to-face students but did not feel confident in the reliability of the testing that was conducted in a VC course. Rather, they were forced to trust the management of testing materials to students in a way that is not expected in a face-to-face classroom. Overall, teachers were more lenient with deadlines because it was more difficult to collect assignments and, as a consequence, they felt that feedback to the students was often delayed longer than they would have liked.

The participants recognized that there are interruptions in all courses because every school has special events that pull students out of class. However, as a VC course involves up to four schools, there is the potential for four times the interruptions. These teachers noted that, even more frustrating than losing a class to special events, is losing just a portion of students. They felt when a class is lost everyone misses content but when only part of the class is missing the teacher struggles to figure out what to do with the group of students still present. They are left wondering if they should continue with a regular activity and catch up missing students upon their return, or have students present complete an alternate activity. One participant made the comment “The challenge would be if there was an event at one school and it wasn’t at the other. And, so, you’re faced with one kid there.” In order to minimize these types of interruptions, the administration and non-VC teachers in the rural school need to recognize the importance of VC courses to the rural students when organizing school events.

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One participant suggested that VC students be screened before being placed in a VC course but did not suggest how. Another participant commented that the dynamics of the class changed, depending upon the academic strength of the students in the remote schools or how outgoing they were. Many participants mentioned their attempts to include all students in all schools equally in their lessons. Simonson et al. (1999) called this equivalency, stating that the closer the experience of the remote students was to the local students, the more equivalent the outcomes would be and equivalency is the responsibility of the teacher. New pedagogies are necessary to equalize the experience of all students (Bernard et al., 2004; Simonson et al., 1999; Simonson et al., 2011).

Several participants mentioned that there continued to be some negative feelings about VC that need to be overcome at the school level. Non-VC teachers, for example, see it as an inconvenience to be asked to teach a VC course. It is important to note that even VC teachers did not necessarily place VC-related professional development as a priority. One participant commented that VC was seen by some staff members as a disadvantage to both teachers and students because of the difficulty of teaching and learning over distance. However, VC was actually an advantage because of the teacher expertise, student skills and course choice it could bring to a rural school. One participant commented:

I'd see the work that was going on there and it was, in some ways, they were doing things, which I wouldn't see in my regular classroom. The collaborative learning and working together to solve problems and just that little bit of insight that these kids weren't at a disadvantage just because

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they were taking videoconference, I would say in some way they were actually, have an advantage on it.

On the questionnaire, participants identified a positive attitude, enthusiasm for their course, and the ability to organize as key attributes for successfully teaching a VC course. They also rated feeling comfortable with technology and being adaptable fairly high in importance. While they did not rate developing relationships with students highly on the questionnaire, it was mentioned as important in all six interviews.

Learning to use the technology was described as difficult at first but something that became easier as the course progressed. Many participants cited one of their future goals as further exploration of the uses of technology to bridge the distance in a VC classroom. Another future goal for several participants was learning to develop relationships within the constraints of the VC classroom. Participants postulated that improving the teacher-student relationship would help overcome the classroom management issues they encountered and allow them to more easily balance their time and attention between the four schools.

Teaching a VC course was not the preferred teaching assignment for some participants. However, while they felt that there was room for improvement, generally, all of the participants agreed that the VC program was an asset to the rural schools. One participant commented: "It's being done right and, like I said, it's offering students the opportunity to take courses that they may not otherwise get the opportunity to take" and another participant added: "Even though online

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courses are offered, VC is closer to classroom instruction and allows students to ask questions and be taught in real time, making it more personal than online.”

Attributes that Contribute to Successful VC Teaching

The important personal attributes identified by the participants are listed in Table 14 below. The most important personal attribute identified by the participants for being a successful VC teacher was that of being organized. This was cited as being important on the basis that materials were being delivered to up to four schools and there needed to be a way for absent students in remote schools to gather the information they had missed. This attribute was followed by: being comfortable with various forms of technology, having good communication skills, and being enthusiastic with the course subject matter. While technology was the foundation of a VC course, several participants indicated that it was important that VC teachers have good, clear communication skills to ensure that students have a

Table 14. Important Personal Attributes, as Identified by the Participants

Importance	Attributes
Most important	Being organized
Next most important	Being comfortable with various forms of technology
	Having good communication skills
	Being enthusiastic about the subject material
Fairly important	Being willing to learn new skills
	Having a positive attitude
	Being adaptable
	Being an innovative thinker
	Being able to engage students
Lowest importance	Being comfortable with computer use
	Being passionate about teaching
	Having the ability to get to know the students individually
	Developing relationships with students

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clear understanding of the lesson purpose and goals. As well, they felt that being an enthusiastic teacher made the course more interesting for students.

Less important attributes, still considered noteworthy by the participants, were being willing to learn new skills, having a positive attitude, being adaptable, being an innovative thinker, and being able to engage students. Having a positive attitude and being innovative was seen by participants as helping to engage the students and, concomitantly, student engagement increased academic achievement. Participants felt it was necessary for VC teachers to learn new skills and be willing to adapt lessons as they created their VC course.

Other attributes identified as necessary were being comfortable with computer use, being passionate about teaching, and having the ability to get to know the students individually. The computer use attribute is a component of the technology attribute mentioned earlier and is the basis of a VC course. Cuffman and MacRae (1996) reported that successful teachers show enthusiasm for their subject area and work to develop rapport with their students.

The final item noted by the participants was about developing relationships with students. Participants felt that creating a personal connection with the students helped students to be successful and that a strong relationship between the teacher and students was necessary to ensure adequate motivation and desire to learn. As Moore and Kearsley (2005) suggested, the most effective DE teachers were able to develop a relationship with their students through the DE technology.

The important teaching skills identified by the participants are listed in Table 15 below and are discussed in more detail following the chart.

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Table 15. Important Teaching Skills, as Identified by the Participants

Importance	Skills
Most important	Ability to use Moodle™
	Ability to make contact with students
Next most important	Giving timely feedback to students
	Balancing the focus between the schools
	Willing to try new instructional methods
Fairly important	Knowledge of the prescribed learning outcomes
	Using formative and summative assessments
Lowest importance	Knowing how to use the SmartBoard™

The teaching skills identified by the participants as important appeared to parallel some of the personal attributes they listed. The ability to use Moodle™ and the ability to make individual contact with students were identified as the most important skills. Again, this finding supports the suggestion that the importance of technology and organization as well as developing relationships with students is key to successful VC courses. The next most important skills cited were giving timely feedback to students, balancing the focus given to each school, and being willing to try new ideas for instruction. These teaching skills were considered important for making the students feel part of the whole class, regardless of their site location, as well as ensuring that the students knew how they were doing in the course at regular intervals. The participants felt that it was important to try new ideas in their VC course because some activities did not convert appropriately or easily from a face-to-face course to a VC course.

The next group of skills listed by participants as fairly important included having knowledge of the prescribed learning outcomes and using both formative and summative assessments with students. The first of these skills parallels the teacher knowing the subject matter, which was considered very important to the

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success of a senior-level course and the second is an expansion of providing timely feedback: teachers noted it was important to provide feedback in a variety of forms before the testing or final grading occurred. Research shows that the feedback should be frequent and ongoing (Ferdig et al., 2009; Oliver, Osborne, & Brady, 2009; Owens, Hardcastle, & Richardson, 2009; Rendon, 2001). The least important skill identified by the participants was the ability to use the SmartBoard™. The comments indicated that the basics of this technological skill were learned quickly. Participants indicated that it was not as important to have proficiency with the SmartBoard™ before starting a VC course, but was important in its delivery. However, the participants indicated a desire to learn how to use more advanced functions on the SmartBoard™ beyond the basic functionality.

The majority of the participants agreed that a good VC teacher must be willing to try new ideas for instruction. They noted that some traditional methods of instruction, such as some laboratory work and group activities, did not work well through VC so alternate activities must be planned. As some alternate plans will not be effective, VC teachers must also be willing to keep trying until they find what will work both through VC as well as in multiple locations. As Lai and Pratt (2009) found, without formal training prior to teaching a VC course, teachers did not realize the impact the VC format would have. However, very early in their VC course, participants developed the understanding that they had to alter their teaching pedagogy to ensure a successful VC course. They quickly realized that, while VC shares some characteristics with face-to-face, it is not the same and the

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impact of the technology must be considered (Hobbs, 2004; Offir & Lev, 2000; Peterson, 2004).

The following chapter will provide a summary of the conclusions drawn from this study regarding the perceived attributes of a VC teacher in this school district and the collective experience of the participants. The discussion will include suggestions for further research on the topics relating to teaching a VC course to secondary school students in multiple schools.

CHAPTER VI

CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

A school district located in British Columbia had four small rural schools connected by a room-based videoconference system. VC teachers were required to simultaneously teach students in up to four schools. The timetables and school calendars were aligned for the four rural schools and the VC teacher from one rural school had students in his/her home school and, also, met synchronously via VC with students in up to three other rural schools for 75 minutes per day. There was face-to-face contact with the students in the remote schools when the VC teachers traveled to each remote school twice throughout the semester. There was also asynchronous contact when the VC teachers used Moodle™ and email to contact students outside of class time. This program offered eight senior courses each year.

The school district had committed a large amount of resources to the VC program. They established state-of-the-art VC suites within the rural schools and hired a computer technician to ensure the smooth operation of the system. However, there did not appear to have been very much consideration given towards the VC teacher selection process or a training program for the VC teachers. Cohen (2003); Lai and Pratt (2009); and Offir and Lev (2000) indicate that the role of the teacher is significant to student learning. The teacher selection and training processes could, therefore, have a great impact on the success of the rural VC program in this school district.

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Because the rural VC program was relatively new, few administrators and teachers had personal experience with teaching a VC course. However, it was vital that administrators selected good VC teaching candidates in order to ensure the continued success of the program and for teachers who are considering becoming a VC teacher to understand the experience before they make a decision. Making good decisions about VC teacher selection could contribute to the long-term retention of VC teachers. As Fantilli and McDougall (2009) found, the effectiveness of teachers increased significantly after the first few years of experience in the same assignment.

This study aimed to investigate and describe the experience of being a rural VC teacher in this school district by exploring their positive experiences, challenges, and the attributes that they perceived as contributing to their success.

Conclusions of the study

The description of teaching a VC course could help this school district select suitable teachers for their rural VC courses and support them with appropriate and useful professional development. This description could also be useful to prospective VC teachers in this school district in order to help them understand the skills needed before undertaking the demands of teaching a VC course.

The data gathered indicated that the most important skills necessary to becoming a successful VC teacher were being comfortable learning and implementing new forms of both technology and pedagogy. Both of these were vital to creating and delivering an effective VC course. The most important

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personal attributes were being organized and being an enthusiastic teacher with good communication skills and the ability to create a personal connection with students. These skills were important to developing student trust, which was necessary for learning to occur. The most important prior knowledge needed for a successful VC course was having knowledge of the prescribed learning outcomes for the course and experience teaching the course in a face-to-face setting. The rural VC program offered courses at the senior level and it was crucial that the teachers had the content knowledge and teaching experience to successfully deliver these courses before attempting to facilitate the learning experience of students through a VC situation.

While there was a range of experiences across the participants, the more experienced face-to-face teachers appeared to better understand the necessity of the program to rural schools and enjoyed the challenge more than the newer teachers. These more experienced teachers described their experience in a more positive light, while the newer teachers described various struggles that led to frustration and reluctance to continue as a VC teacher. VC teachers who were invited by administration to participate in the rural VC program had more teaching experience than those required to participate because of a job posting. Some participants described the need to have a strong presence as a VC teacher and, quite often, that strong presence came from prior experience in the classroom.

All of the participants described experiencing some success in their VC course, with the most satisfaction derived from developing relationships with and between students and from conquering the use of new technology. However,

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despite being the most satisfying areas, these were also the two areas that VC teachers wanted to improve on for their future VC courses. Knowing how to use the technology was not considered a pre-requisite to teaching via VC, but it was seen as important that the VC teacher be willing to learn how to use and implement the technology within a VC course. The participants recognized the various supports they had from the school district in learning to use new technology, while simultaneously also requesting ongoing professional development in this area. They learned basic skills in order to start developing their course but wanted to learn more sophisticated techniques and ways of integrating technology into their pedagogy as they progressed through their course. It was interesting to discover the extent to which teaching a VC course had influenced the teachers' face-to-face courses. Several of the participants commented on taking the technology skills they learned from their VC course and using them in their face-to-face course.

The other area of importance cited by participants was developing relationships. From participants' comments, it seems clear that it was important for VC teachers to continue to visit the remote schools, as the first visit was often a turning point in developing the teacher-student relationship. Beyond that, it was necessary for VC teachers to prioritize creating relationships within the VC course and learn how to do this despite the distance in a VC course. The participants requested assistance in identifying VC pedagogical approaches that would help them reach students and develop relationships with and among them, regardless of the distances between schools and teachers.

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It was also important that students had the opportunity to develop student-student relationships between schools. Participants suggested that this would be easier to do if the students selected for VC courses were academically and socially strong. While they also commented that schools may want to carefully consider the students they are placing in VC courses, no suggestions were made as to how to do this.

The participants recognized that it is vital to adapt their course to suit the VC classroom. They expressed difficulty in discovering how to do this as well as the desire to have help from the school district in learning new pedagogies that would support the VC medium. Considerable interest was also expressed in pedagogies that would help them deliver their course learning outcomes through the VC medium in the most effective and efficient manner.

The rural VC program was very important to the rural schools and it was important that it be successful. It brought teaching expertise and course options to students, who would not otherwise have access to these in their home schools. As such, it was important that the most suitable teachers were selected for the program and that those teachers were supported in teaching the best VC courses possible. These teachers needed to possess the most appropriate skills; however, they also need to be willing to put in the extra effort necessary to create and deliver a VC course.

The participants identified a need for professional development in the use of technology and learning pedagogy specific to a VC course. They commended the school district for doing a great job teaching the basic uses of the technology

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and supporting its use in the classroom. However, participants felt that instruction on pedagogies appropriate to the VC teaching environment were much neglected. They offered a few suggestions for self-directed professional development but felt that some research was needed at the school district level and that there was considerable room for the provision of additional professional development opportunities. Generally, many participants commented on their appreciation of the support that the school district presently offered and that the success of the program so far could be attributed to that level of support.

Value of the study to the school district

The topic for this study was selected because there was a need within this particular school district for more information on how to continue to provide high quality VC courses. The VC program was very important to the students within the rural schools and, while it had experienced success, it was important that it continue to improve. The study was designed to identify areas of the program that were working well and areas that needed improvement; as well as identify teacher attributes which could contribute to successful implementation of VC courses.

The results of this study could help the school district select suitable VC teachers, train new VC teachers, and provide suitable ongoing professional development to VC teachers. The results could also provide information to help potential VC teachers make a decision about becoming a VC teacher.

As a result of this study, the school district in the study offered its first professional development day specifically for rural VC teachers in September 2015. Six rural VC teachers, teaching eight VC courses (two teachers taught two

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courses each), were given information on using the technology in the VC suites, developing and managing a VC course, and using Google Forms™ and Google Classroom™. Five of the teachers provided feedback and all agreed that the day was useful. They appreciated that they were able to learn from the struggles and successes of other VC teachers but they also liked learning strategies and techniques from people with more expertise. They requested additional information on developing a VC course and using Google Classroom™ but they also expressed interest in learning how to create a website and video lessons to support their VC classroom instruction. They also asked for ideas for online collaboration between students for project and discussion purposes. Further professional development days such as these are planned for coming years.

Future Research

On the basis of the findings in this study, the school district may find it useful to conduct follow-up research to determine specific areas of professional development needed for present and future VC teachers. They may also look for useful information that experienced VC teachers could provide to beginning VC teachers in order to develop an "introduction to VC teaching" course to be taken by all prospective VC teachers.

District human resource and school administrators may investigate how rural VC programs can be further supported. For example, for the recruitment of new teachers, it may be beneficial to conduct research to compare the effectiveness of the two current methods of selecting VC teachers: by invitation or

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within a job posting. This might help to determine if one is superior to the other, in terms of teacher retention, as well as student satisfaction and success.

Five of the eleven VC teachers invited to participate in this study did not respond. Considering the small population, and even smaller participant list, the school district may gain valuable information by investigating why those teachers chose to not participate. They may want to ask questions such as:

1. Do you have positive, negative or neutral feelings about the rural VC system?
2. Was your non-participation a result of those feelings? Please explain.
3. Was your non-participation a result of another reason? If yes, please elaborate on the reason.
4. If asked now, would you participate in the study? If yes, what changed your mind?

The answers to these questions may provide ideas for further research that were not revealed by the teachers who did choose to participate.

This study has yielded a description of the experience of being a VC teacher in this one school district. The participants in this study requested further information on the teaching pedagogies that are specific to teaching through VC, as well as ongoing professional development. More specifically, future research could concentrate on two questions. First, what are the most effective methods for a VC teacher to employ, in order to develop relationships with, and between, students in remote locations? Second, what is the best way to deliver initial and ongoing professional development to VC teachers? These broader questions may

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be of interest to other school districts and teachers using VC to deliver courses to students.

Summary and Conclusion

The results of this study are a description of the experience of being a rural VC teacher in a particular school district, as well as a list of teacher attributes that participants identified as contributing to their success as VC teachers. The information they contributed could help the school district both select suitable rural VC teachers and provide professional development to VC teachers. Potential VC teachers could use the information to help make a decision about becoming a VC teacher.

Using this information to continue to improve the rural VC program could also benefit students in those schools who require the courses not provided within their own school. As the VC teachers improve their courses, the students would likely benefit.

The school district may be interested in further research. In order to develop a district professional development plan for VC teachers, it would benefit the school district to do further research in this area. They may also find it useful to get the perspective of the students who have completed a rural VC course.

Beyond the school district, there are numerous possible areas of research: VC teachers simultaneously teaching to secondary school students in multiple locations, students who learn through VC, the effects of the VC teacher visits to the remote locations, and the effects of ongoing VC teacher professional development are just a few possibilities.

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APPENDIX A

Athabasca University Research Ethics Approval



MEMORANDUM

DATE: November 29, 2012
TO: Tracy Buck
COPY: Dr. Debra Hoven (Research Supervisor)
Janice Green, Secretary, Athabasca University Research Ethics Board
Dr. Simon Nuttgens, Chair, Athabasca University Research Ethics Board
FROM: Dr. Rick Kenny, Chair, CDE Research Ethics Review Committee
SUBJECT: **Ethics Proposal #CDE-12-11: "Examining the experiences of secondary school teachers of rural videoconference courses"**

Thank you for providing revised documentation received November 26 which was requested by the Centre for Distance Education (CDE) Research Ethics Review Committee in the Conditional Approval memo dated November 13, 2012. Your cooperation in editing to incorporate changes requested was greatly appreciated, in addition to the pdf School District materials you sent separately.

On behalf of the CDE Research Ethics Review Committee, I am pleased to confirm that this project has been granted **FULL APPROVAL** on ethical grounds, and you may **proceed immediately**.

The approval for the study is **valid for a period of one year from the date of this memo**. If required, an extension must be sought in writing prior to the expiry of the existing approval. **A Final Report is to be submitted when the research project is completed**. The reporting form can be found online at <http://www.athabascau.ca/research/ethics/>.

This approval of your application will be reported to the Athabasca University Research Ethics Board (REB) at their next monthly meeting. The REB retains the right to request further information, or to revoke approval at any time.

As implementation of the proposal progresses, if you need to make any significant changes or modifications please consult with your supervisor to obtain their support for those changes, then please forward this information immediately to the CDE Research Ethics Review Committee via rebsec@athabascau.ca, for further review.

If you have any questions, please do not hesitate to contact Janice Green at janiceg@athabascau.ca or rebsec@athabascau.ca.

APPENDIX B

Pre-Interview Questionnaire

Please complete this questionnaire with as much information as possible and return it to tbuck@telus.net or Tracy Buck, 333 Archibald Rd, Clearwater, BC V0E 1N1

There are two options to complete the survey:

- 1) You may print this questionnaire, complete it, and mail it using the Canada Post address above or scan the completed version and attach it to an email to send it back. If you choose this option, you will want to make the response boxes larger before printing.
- 2) Or you can complete this questionnaire in MSWord, save it to your computer and attach it to an email to send it back. Alternatively you can print the completed questionnaire and mail it using the Canada Post address above.

On the questionnaire please identify yourself by the code included in the email to which this document was attached. Thank you.

Your code is:

1. Please provide the following background information.

		Response
Please list your TQS teaching category		
Please list the teachable subjects you achieved through education		
Please list the teachable subjects you achieved through teaching experience		
Please list your teaching experience, in years, prior to teaching VC	TOC	
	Teaching	

2. Have you ever personally taken a course delivered by DE? If yes, please indicate all that apply.

		Response
Yes	VC	
	Online	
	Paper correspondence	
	Other, please specify	
No		

3. Please list the VC courses that you have taught and how many times you have taught each.

	Course name	Number of times
Course one		
Course two		

EXPERIENCES OF TEACHERS WITH VIDEOCONFERENCE COURSES

Course three		
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4. Please describe how and why you became a VC teacher.

		Response
How did you become a VC teacher?	Your principal approached you with the idea	
	You approached your principal with the idea	
	You applied for a posting that included the VC course	
	Other, please explain	
Why did you want to become, or agree to become, a VC teacher?		

5. How much do you use technology in your personal life?

	3+ hrs /day	2-3 hrs/day	1-2 hrs /day	Less than 1hr/day	Never
Internet for gathering information					
Internet for social media					
Cell phone					
Smart phone					
Computer					
Tablet or iPad					
Online gaming					
Console gaming					

6. When teaching in the VC classroom, how often do you use the following technology?

	Every class	3-4 classes/wk	1-2 classes/wk	Never
SmartBoard™				
Bridgit™				
Front camera				
Back camera				
Dvd player				
Moodle™				
Internet for				

EXPERIENCES OF TEACHERS WITH VIDEOCONFERENCE COURSES

teaching				
Student computers				

7. Below is a list of personal attributes, skills, and talents. Please select the five that you think are the most important to teaching a successful VC course. Rank your five selections from 1 to 5 with 1 being the most important and 5 being the least important.

	Top 5
Social person	
Have the ability to read emotions and empathize with people	
Have a good sense of humour	
Have a positive attitude	
Reliable	
Enthusiastic about the subject matter	
Adaptable	
Organized	
Timely and on time	
Willing to collaborate	
Good communication skills	
Creative	
Innovative thinker	
Experience in theater or performing arts	
Comfortable with computer use	
Comfortable with various forms of technology	
Able to use social media, such as Facebook	
Good decision-maker	
Demonstrates respect for others	
Passionate about teaching	
Willing to learn new skills	
Engages students	
Gets to know the students individually	
Honest	
Other qualities not listed above – please identify	
Comment (optional):	

8. Below is a list of teaching skills. Please select the five that you think are the most important to teaching a successful VC course. Rank your five selections from 1 to 5 with 1 being the most important and 5 being the least important.

Giving timely feedback to students	
Using both formative and summative assessments	
Having knowledge of the prescribed learning outcomes	
Able to use the SmartBoard™	
Able to use Moodle™	
Balancing the focus given to each school	

EXPERIENCES OF TEACHERS WITH VIDEOCONFERENCE COURSES

Making individual contact with all students	
Willing to try new ideas for instruction	
Other skills not listed above – please identify	
Comment (optional):	

9. Please describe what you like about teaching a VC course.
10. Please list some frustrations that you feel when teaching a VC course.
11. Considering the prescribed learning outcomes for your course, describe any areas that are difficult to deliver/implement through VC and how you handle the difficulty.
12. Considering the support that you have received from the school district, your administrator, other teachers, etc.,
 - a. What, if any, support did you receive that was most helpful?
 - b. What, if any, support would have been helpful, but was not offered?
13. Considering the planning that you did for your VC course,
 - a. What information was most helpful to you
 - i. before your course started?
 - ii. during your course?
 - b. What information would have been helpful to you
 - i. before your course started?
 - ii. during your course?
14. What are your future goals for your VC course?
15. What are your future goals for your VC teaching career?

APPENDIX C

Interview protocol

Interview start time:

I will start the recording now.

Date:

Method of meeting:

Researcher: Tracy Buck

Participant (coded name):

Thank you for agreeing to participate in this study. This interview is being recorded so that I can create a transcript for analysis. The recording, transcription and any papers created in the analysis process will be kept locked in a safe in my home until date 5 years from completion at which time they will all be destroyed.

You have signed the informed consent form so you have agreed to participate. However, if at any time you wish to stop participating in this interview, we will stop and erase the recording.

Only your coded name will be entered into the transcription of this interview. The study report will not contain your name, school or VC course so there will be nothing to identify you in the results.

Do you have any questions before we start?

The purpose of this study will be to describe the experience of teaching a rural videoconference (VC) course in this school district and identify personal and professional attributes beneficial to a successful VC course. I am going to ask for your descriptions of your VC experiences in three main areas: your most positive experiences, your most difficult experiences, and your overall success as a VC teacher.

1. Please describe your three most positive experiences teaching a VC course.
 - a. What do these experiences have in common?
 - b. How are these experiences different from your “normal” teaching experiences?
 - c. Which experience was the most satisfying and why?

2. Please describe your three most difficult experiences teaching a VC course.
 - a. What do these experiences have in common?
 - b. What was the biggest challenge arising out of these experiences?
 - c. What other challenges resulted from these experiences?
 - d. How did you, or how will you, overcome these challenges?

3. Describe how successful you feel as a VC teacher.

EXPERIENCES OF TEACHERS WITH VIDEOCONFERENCE COURSES

- a. What aspects or characteristics of yourself helped you to be successful?
 - b. What about yourself would you like to change to be even more successful?
 - c. Describe some specific examples of how you are supported as a VC teacher.
 - d. What additional support do you feel you need to be an even better VC teacher?
4. Given the opportunity, will you teach a VC course again?
- a. Why or why not?
5. Do you have anything that you would like to add?

Thank you for participating in this study. I really appreciate your help. If you are interested in seeing the results, please email me and I will send you a copy when my Masters degree is completed. Thank you again.

Interview end time:

APPENDIX D

Informed Consent Letter

Title of the study:

Examining the experiences of secondary school teachers of videoconference courses

Contact Information:

This study is being conducted as part of a Master of Education (Distance Education) degree at Athabasca University. Tracy Buck is the person conducting the study and she can be reached by phone 250-674-3643 or by email to tbbuck@telus.net.

Dr Debra Hoven is supervising this study and can be reached by email to debrah@athabascau.ca or at 1-866-441-5517.

This study has been reviewed by the Athabasca University Research Ethics Board. Should you have any comments or concerns regarding your treatment as a participant in this study, please contact the Office of Research Ethics at 780-675-6718 or by e-mail to rebsec@athabascau.ca

Invitation:

As you have been identified as a rural videoconference teacher in School District #xx at some time between 2009 and 2012, I would like to invite you to participate in this study.

Description of the study:

This study involves contacting ten rural videoconference teachers from School District #xx and requesting volunteers to participate in a 15-30 minute pre-interview questionnaire and a 30-60 minute individual interview. The questionnaire will be completed through email and the interview will be conducted in person or over the Internet on a mutually agreed upon date.

The purpose of the study is to develop an in-depth description of the experience of a rural VC teacher within School District #xx and a teacher-identified list of personal and professional qualities that contribute to the success of a VC course. The questionnaire will gather background information and allow you to provide information quickly. The interview will ask about the benefits that you have gained from teaching a VC course as well as the challenges that you have encountered.

From the these two sets of data, a collective description of the experience of a School District #xx rural VC teacher will be written which will include the benefits, challenges and personal and professional qualities of a successful rural VC teacher.

EXPERIENCES OF TEACHERS WITH VIDEOCONFERENCE COURSES

Risks and Benefits:

There is no risk involved in this study. None of the information that you provide will be identified with you in the report. On the pre-interview questionnaire and interview transcript the information you provide will only be identified by a code, not by name.

By describing the experience of teaching a VC course in this school district and identifying the benefits and challenges, there is an opportunity to provide the school district with information and suggested improvements to the rural VC system. Improvements may create a better teaching environment or they may help you and other VC teachers become more confident and be better supported in implementing VC teaching pedagogies.

Right to refuse:

You may refuse this offer to participate at any time, with no repercussions of any form. Even if you consent to participate, you may withdraw from the study at any time. If you withdraw prior to submitting the pre-interview questionnaire then none of your information will be used in the study. However, if you withdraw after submitting the pre-interview questionnaire then your responses may already be grouped with other responses and cannot be removed. As well, you are not required to comment on every discussion item and have the option of leaving any item blank if you do not feel comfortable or able to answer the item.

Privacy, confidentiality and anonymity:

The only people who will have access to the raw data are Tracy Buck and a co-coder. The co-coder is a teacher from another district who does not know any of the invited participants and will not ever see their names, as any identifying information will be removed by the researcher before the transcripts are seen by the co-coder. The electronic data will be stored on Tracy Buck's password-protected computer and the paper data in a locked safe. When the study is complete, the raw data information gathered from the pre-interview questionnaires and the individual interviews will be removed from Tracy Buck's computer to a flash drive and it, as well as any related information on paper, will be locked away in a safe in Tracy Buck's house. After five years, all information related to the study will be destroyed by erasing the electronic information and burning the paper information. Destroying the information is a requirement for the Research Ethics Board approval.

The study report will be a public document. It will be a published thesis, kept by Athabasca University, and the public will have access to it. The study report will not include any information that will identify the participants or the school district. Participants will be identified by codes, and their schools and videoconference courses will not be identified.

All information will be held confidential, except when legislation of a professional

EXPERIENCES OF TEACHERS WITH VIDEOCONFERENCE COURSES

code of conduct requires that it be reported.

Results of the study:

The existence of the research will be listed in an abstract posted online at the Athabasca University Library's Digital Thesis and Project Room; and the final research paper will be publicly available.

Upon request, interested participants may receive a copy of the final research paper through Tracy Buck.

Informed consent:

I have read and understood the information contained in this letter, and I agree to participate in the study, on the understanding that I may refuse to answer certain questions, and I may withdraw at any time during the data collection period.

_____	_____	_____
Please print name	Signature	Date

APPENDIX E

Letter requesting permission from Superintendent of Schools

Date

Superintendent's Name

School District Address

Dear

I am currently working on my Master of Education (Distance Education) degree through Athabasca University, which I plan to have completed by June 2013. I am preparing to conduct a research study for my thesis from which I will prepare a paper entitled "Examining the Experience of Secondary School Teachers of Rural Videoconference Courses". The purpose of the study will be to describe the experience of teaching a rural videoconference (VC) course in this school district and identify personal and professional attributes beneficial to teaching a successful VC course.

This study involves contacting 2009-2012 rural VC teachers, current and previous, in School District #xx and requesting volunteers to participate in a pre-interview questionnaire and an individual interview. I have a list of ten teachers.

The study report will not include any information that will identify the participants or the school district. Participant names and their schools will be kept confidential. The videoconference courses offered in rural schools will be listed but the teachers will not be identified by the course they teach. When the study is complete, the information that I gather in the interview will be removed from my computer to a flash drive and it, as well as any related information on paper, will be locked away in a safe in my house. All information related to this study will be destroyed after five years, by erasing the electronic information and burning the paper information. Destroying the information is a requirement for the ethics board approval.

I would like your permission to conduct this study in this school district.

In order to proceed, I need your consent, in writing, on school district letterhead including your position title. I need permission to (1) proceed and (2) use school email to contact the teachers. Once I have your permission, and the ethics board approval, I will notify the secondary school principals before contacting the rural VC teachers.

Please let me know if you have any questions or if you would like me to forward more information from my study proposal. This letter, with the identifying names and places removed, will be included in the Appendix of my published report. Thank you for your support.

EXPERIENCES OF TEACHERS WITH VIDEOCONFERENCE COURSES

Respectfully yours,
Tracy Buck

APPENDIX F

Letter of information for principals

Date

Principal's Name

Secondary School Name

School Address

Dear

I am currently working on my Master of Education (Distance Education) degree through Athabasca University, which I plan to have completed by August 2013. I am preparing to conduct a research study for my thesis from which I will prepare a paper entitled "Examining the Experience of Secondary School Teachers of Rural Videoconference Courses". The purpose of the study will be to describe the experience of teaching a rural videoconference (VC) course in this school district and identify personal and professional attributes beneficial to teaching a successful VC course.

This study involves contacting 2009-2013 rural VC teachers, current and previous, in School District #xx and requesting volunteers to participate in a pre-interview questionnaire and an individual interview. I have a list of eleven teachers.

The study report will not include any information that will identify the participants or the school district. Participant names and their schools will be kept confidential. The videoconference courses offered in rural schools will be listed but the teachers will not be identified by the course they teach. When the study is complete, the information that I gather in the interview will be removed from my computer to a flash drive and it, as well as any related information on paper, will be locked away in a safe in my house. All information related to this study will be destroyed after five years, by erasing the electronic information and burning the paper information. Destroying the information is a requirement for the ethics board approval.

I have consent from the Superintendent of Schools and I am now notifying you that I will be contacting the current or former rural VC teacher(s) in your school.

Please let me know if you have any questions. This letter, with the identifying names and places removed, will be included in the Appendix of my published report. Thank you for your support.

Respectfully yours,

EXPERIENCES OF TEACHERS WITH VIDEOCONFERENCE COURSES

Tracy Buck

APPENDIX G

Initial email invitation to participants

Date
VC Teacher
Teacher's Secondary School
School Address

Dear

I am currently working on my Master of Education (Distance Education) degree through Athabasca University, which I plan to have completed by June 2013. I am preparing to conduct a research study for my thesis from which I will prepare a paper entitled "Examining the Experience of Secondary School Teachers of Rural Videoconference Courses". The purpose of the study will be to describe the experience of teaching a rural videoconference (VC) course in this school district and identify personal and professional attributes beneficial to teaching a successful VC course. The results of this study could help the school district provide useful in-service and professional development for the current VC teachers. The results may also provide information about being a rural VC teacher to prospective rural VC teachers.

The Superintendent of Schools has consented to this study and your principal has been notified of my intent to contact you.

This study involves contacting 2009-2012 rural VC teachers, current and previous, in School District #xx and requesting volunteers to participate in a pre-interview questionnaire and an individual interview. I have a list of ten teachers.

The study report will not include any information that will identify the participants or the school district. Participant names and their schools will be kept confidential. The videoconference courses offered in rural schools will be listed but the teachers will not be identified by the course they teach. When the study is complete, the information that I gather in the interview will be removed from my computer to a flash drive and it, as well as any related information on paper, will be locked away in a safe in my house. All information related to this study will be destroyed after five years, by erasing the electronic information and burning the paper information. Destroying the information is a requirement for the ethics board approval.

Since you have been identified as one of the current or previous rural VC teachers in School District #xx, I would like to invite you to participate in my study. If you are interested in participating please contact me within two weeks of the sending of this e-mail. If you are unable to participate, please let me know so that I can remove your name from the list of possible participants.

EXPERIENCES OF TEACHERS WITH VIDEOCONFERENCE COURSES

Please let me know if you have any questions. You may also contact my thesis supervisor, Dr. Debra Hoven, at debrah@athabascau.ca or 1-866-441-5517. Thank you for your support.

This study has been reviewed by the Athabasca University Research Ethics Board. Should you have any comments or concerns regarding your treatment as a participant in this study, please contact the Office of Research Ethics at 780-675-6718 or by e-mail to rebsec@athabascau.ca

This letter, with the identifying names and places removed, will be included in the Appendix of my published report.

Respectfully yours,
Tracy Buck