Preparing pre-service teachers for online teaching

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Preparing pre-service teachers for online teaching

by

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For my family
Jonathan and Grace
You inspire me to be the best I can be.
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This dissertation combines studies and research from two educational fields as a partial requirement for a major in Curriculum and Instruction and a minor in Applied Linguistics and Technology. It is presented in a non-traditional dissertation format that includes three publishable articles with the introduction and conclusion chapters. The first article represents the literature review portion that includes a critique of an existing skills framework for online language teaching followed by a proposed framework for online language teaching skills. This article also uses a systems view to look at the roles and responsibilities of various stakeholders in an online learning system. Four major recommendations are provided to help language teacher training programs prepare future language teachers for online language teaching. The second article starts with a review of research and literature on conceptual change in education. It is followed by a proposed conceptual change framework to help pre-service teachers increase their awareness of online education, commonly known in the US as virtual schooling (VS). This study used a grounded approach to identify common preconceptions, misconceptions, and concerns of VS based on secondary data that included pre-service teachers’ personal journals and responses to a set of materials related to VS in part of a curriculum intervention in a pre-existing introductory field experience course at a large Midwestern university. Findings were complemented by insights from an interview with the course instructor and the researcher’s journal. The article shows the importance of identifying pre-service teachers’ preconceptions, misconceptions, and concerns about VS to facilitate the selection of relevant resources and the design of curricular activities. The third article takes a case study approach to the study of a pilot virtual field experience. This article proposes that a field experience on VS should be offered virtually because traditional field experiences cannot fully capture the reality of VS since VS includes changes in roles, such as the complementary roles of a VS teacher and a VS site-facilitator. An in-depth analysis was conducted on the data that included personal journals and reflections from three teacher candidates at a large Midwestern university. Findings were complemented with insights from interviews with the VS teacher and the university field placement director, and the researcher’s journal. The article sheds light on the importance of virtual field experiences to facilitate the understanding of VS.
CHAPTER 1: GENERAL INTRODUCTION

The ubiquity of computers in schools, increase in personal computing, and Internet access have led to new educational opportunities. More specifically, technological advancements have made it possible to go beyond the constraints of classroom walls via online classrooms. Both virtual schooling (VS) in the United States (U.S.) and online language learning have seen a tremendous growth in the last decade (Barbour & Reeves, 2009; Clark, 2001; Davis & Ferdig, in press; Felix, 2003; Ferdig, Cavanaugh, DiPietro, Black, & Dawson, in press; Hubbard & Levy, 2006; National Forum on Educational Statistics (NFES), 2006; Roblyer, 2003, 2008; Setzer, Lewis, & Green, 2005; Stickler & Hauck, 2006; Watson, Gemin, & Ryan, 2007; White, 2003; Zucker & Kozma, 2003).

According to Davis & Ferdig (in press), 44 states in the U.S. offer VS opportunities to their K-12 students, with enrollments doubling yearly in up to 20% of virtual schools in the last few years. In the field of distance language learning, White (2003) reported that there were more than 1,300 distance language courses from the 55,000 distant courses registered in 130 countries. She added that the common perceptions of online courses as cost- and time-effective have pushed more providers into the field of online language learning.

Watson, et al. (2007) reported that “forty percent of the online programs responding to a recent survey reported annual growth of over 25% in the 2006-2007 school year, and half of these programs reported growth of 50% or higher” (p. 10). They predicted that the number of virtual school students would continue to expand over the next few years and may even be amplified by legislation in some states that require some form of online experience prior to high school graduation. The raging VS movement seems to be redefining what it means to be “in school” (Roblyer, 2008) and who the key players are (Ferdig, et al., in press). In the area of language learning at a distance, rapid developments in communication technology have increased the demand for online language learning that involves connection of learners, both asynchronously and synchronously as well as autonomous learning.

However, recent research has indicated that teacher education is currently unprepared for VS (Davis & Ferdig, in press; Smith, in press). Smith, Clark, and Blomeyey (2005) reported that many “teachers currently teaching in online environments lack both the theoretical and practical understanding and are ‘learning on the job’” (p. 59) while Barbour,
Kinsella, & Toker (in press) stated that teacher education should step up their role in the preparation of future teachers for VS. Currently, teacher education programs “rarely include courses either about online teaching, or conducted through distance learning” (National Education Association, (NEA) n.d., p. 3). The NEA warned that most of the 86,000 new teachers who enter the profession each year will not have online teaching skills in their professional repertoire unless effective online teaching is modeled in their teacher education program. The lack of online language teacher preparation is also a concern as the increase in online language learning has not been matched with an increase in teacher training for language teachers beyond the technical and software-specific skills. According to Kessler (2006), much of the current instructional technology preparation in language teacher education focuses on hardware and software issues instead of pedagogy. These skills help teachers to use technology but do not prepare them to use technology for language teaching. Hubbard (2008) reported that many language teachers are graduating with little or no knowledge of technology in language teaching, while Jones and Youngs (2006, p. 267) said that there is little “evidence of teacher preparation for teaching online, distance, or hybrid language courses” in the United States. Yet, there are common misconceptions that “any regular classroom teacher… [could be] qualified to teach online” (Davis & Rose, 2007, p. 8) and that “people who have never taught in this medium can jump in and teach a class” (Wood, 2005, p. 36). In reality, distance learning instructors need to have “a paradigm shift in perceptions of instructional time and space, virtual management techniques, and ways of engaging students through virtual communications in addition to the communication skills already required for general effective classroom teaching” (Compton, 2009, p. 75). For language teachers, Hampel & Stickler (2005) stressed that new teaching skills were crucial for teaching online language courses because they required skills that were different from teaching other subjects online because the “subject matter is communication” and there is a “need to focus on the form of interaction as well as the content” especially at the lower level (Hampel & Stickler, 2005, p. 312). To date there have been few attempts to include the skills required for teaching in VS or in online language courses within teacher preparation, even though many teacher education programs have integrated technology courses in their curriculum.
Purpose of the Study

Davis and Ferdig (in press) urged teacher educators to understand this new mode of schooling and to prepare future teachers for it. Even though there has been research on improving teacher education using online teaching and learning, very little effort has been directed at the preparation of future teachers for online teaching. This dissertation, *Preparing Pre-service Teachers for Online Teaching* provides useful research to support the preparation of pre-service teachers for the 21st century education that includes online classrooms. It is an effort to fill the gap in general teacher education and language teacher education and research in these areas. It offers new knowledge to both general teacher education and language teacher education through its comprehensive literature review on the preparation of online language teachers and the research of two innovative practices in the preparation of pre-service teachers for VS. This dissertation also provides two frameworks to support the preparation of pre-service teachers for online teaching.

This dissertation combines studies and research from two educational fields as a partial requirement for a major in Curriculum and Instruction and a minor in Applied Linguistics and Technology. It is presented in a non-traditional dissertation format that includes three publishable articles with the introduction and conclusion chapters. In addition to the partial requirement, this dissertation is largely motivated by my personal experiences as a graduate student in the field of computer-assisted language learning (CALL) and curriculum and instructional technology (CIT). After graduating with a master’s degree in Teaching English as a Second Language (TESL) with a CALL specialization, I continued my graduate studies in a doctoral program in Curriculum and Instruction with a CIT specialization. Because I had been working with research in educational technology, I expected the transition to the field of CIT to be relatively easy since it also dealt with educational research and technology. To my surprise, I found myself facing a form of culture shock because the focus and rhetoric in both fields of study differed even though their foundational ideas appeared to be similar. As I grew as a scholar in CIT, I realized that the research in both CIT and CALL were complementary and could provide valuable insights to each other. This realization triggered my dissertational interest with the aim of providing findings applicable to both CALL and CIT.
Besides my desire to combine the two areas of studies, my research on computer-mediated communication (Compton, 2002, 2004) also helped me see the potential of using technology to support language learning at a distance. As I conducted my responsibilities as a research assistant for a three-year federally funded project, “Teacher Education Goes Into Virtual Schooling” (TEGIVS) at Iowa State University to prepare pre-service teachers for VS, I discovered that little had been done particularly in regard to field experiences to help teacher educators prepare pre-service teachers for VS. This gap was mirrored in the literature on preparation for online language teachers, with only one published framework. These discoveries motivated me to focus my research on effective practices for the preparation of general teachers and language teachers for online or virtual teaching.

**Dissertation Organization**

This dissertation is organized into five chapters, with the first and fifth chapters constituting the introduction and conclusion for the entire dissertation. The first chapter, General Introduction briefly outlines the main purpose of the dissertation and describes the organization of the dissertation chapters. The fifth chapter, Synthesis and Recommendations synthesizes the dissertation’s main argument. It summarizes the findings from chapters two through four, presents recommendations for both general teacher education and language teacher education programs, and identifies potential limitations of transferability between CIT and CALL. Chapters two through four consist of three independent but related publishable articles: a) Preparing language teachers to teach language online: a look at skills, roles, and responsibilities, b) Identification of pre-service teachers’ common preconceptions, misconceptions, and concerns of virtual schooling, and a proposed conceptual-based framework, and c) The impact of and the key elements for a successful virtual early field experience: Lessons learned from a case study.

*Preparing language teachers to teach language online: a look at skills, roles, and responsibilities*

This article represents the literature review portion in a traditional dissertation. It combines relevant research and literature from CALL and distance education in general.
It includes a review and critique of an existing skills framework for online language teaching. This critique is followed by an alternative framework for online language teaching skills. This article also uses a systems view to look at the roles and responsibilities of various stakeholders in an online learning system. Four major recommendations are provided to help language teacher training programs prepare future language teachers for online language teaching.

Pre-service teachers’ common preconceptions, misconceptions, and concerns of virtual schooling, and a proposed conceptual-based framework

The second article starts with a review of research and literature on conceptual change in education. It is followed by a proposed conceptual change framework to help pre-service teachers increase their awareness of online education, commonly known in the US as virtual schooling (VS). Because conceptual change theory states that preconceptions and misconceptions can influence pre-service teacher training experiences, this article found it necessary to identify pre-service teachers’ common preconceptions, misconceptions, and concerns about VS. This study used a grounded approach to identify common themes in the secondary data that included pre-service teachers’ personal journals and responses to a set of materials related to VS in part of a curriculum intervention in a pre-existing introductory field experience course at a large Midwestern university. Findings were complemented by insights from an interview with the course instructor and the researcher’s journal. The article shows the importance of identifying pre-service teachers’ preconceptions, misconceptions, and concerns about VS to facilitate the selection of relevant resources and the design of curricular activities.

The impact of and the key elements for a successful virtual early field experience: Lessons learned from a case study

The third and last article in this dissertation takes a case study approach to the study of a pilot virtual field experience. This article proposes that a field experience on VS should be offered virtually because traditional field experiences cannot fully capture the reality of VS since VS includes changes in roles, such as the complementary roles of a VS teacher and a VS site-facilitator. An in-depth analysis was conducted on the data that included personal journals and reflections from three teacher candidates at a large Midwestern university.
Findings were complemented with insights from interviews with the VS teacher and the university field placement director, and the researcher’s journal. The article sheds light on the importance of virtual field experiences to facilitate the understanding of VS.

As seen in the brief synopses of the three articles, my emphasis is on the need to provide all pre-service teachers with adequate knowledge of online teaching and learning so they can be better prepared for the 21st century classroom. This dissertation includes two proposed frameworks that can be modified and applied in both areas of CALL and CIT and urges teacher educators in general teacher education and language teacher education to include and to model online teaching skills in their programs.

References


CHAPTER 2: PREPARING LANGUAGE TEACHERS TO TEACH LANGUAGE ONLINE: A LOOK AT SKILLS, ROLES, AND RESPONSIBILITIES

A paper published in Computer Assisted Language Learning

Lily K.L. Compton

Abstract

This paper reviews and critiques an existing skills framework for online language teaching. This critique is followed by an alternative framework for online language teaching skills. This paper also uses a systems view to look at the roles and responsibilities of various stakeholders in an online learning system. Four major recommendations are provided to help language teacher training programs prepare future language teachers for online language teaching.

Introduction

Online language learning has steadily increased in popularity over the last decade with the growth of the Internet and proliferation of computers at home and in educational settings ranging from K-12 to post-secondary (Felix, 2003a; Hubbard & Levy, 2006; Stickler & Hauck, 2006a; White, 2003). White (2003) indicated that there were more than 1,300 distance language courses from the 55,000 distant courses registered in 130 countries. She added that the common perceptions of online courses as cost- and time-effective have pushed more providers into the field of online language learning. While the notion of language learning at a distance is not a new phenomenon, rapid developments in communication technology have increased the demand for online language learning that involves connection of learners, both asynchronously and synchronously as well as autonomous learning.

The online context of language learning has prompted the need for new teaching approaches and teaching skills that are different from those used in teaching face-to-face language courses (Hampel & Stickler, 2005). These new teaching skills are crucial for teaching online language courses “whose subject matter is communication” and especially at the lower level where there is a “need to focus on the form of interaction as well as the content” (Hampel & Stickler, 2005, p. 312). Additionally, it requires skills that are different from teaching other subjects online. However, there seems to be little concerted effort in this
direction as the increase in online language learning has not been matched with an increase in teacher training for language teachers beyond the technical and software-specific skills. Moreover, the vast research and best practices for teaching online may not translate well for online language teaching.

Despite a multitude of research-based publications and best practices relating to computer assisted language learning (CALL), including online language learning, there is a dearth of resources on how to prepare teachers for online language teaching or the skills needed for this new teaching environment. To date, no literature review has been published specifically on the skills needed for online language teaching. This literature review is therefore an effort to fill the gap by synthesizing the existing but limited literature and providing recommendations for teacher training programs. However, before proceeding in depth with the synthesis and recommendations, this literature review will attempt to set the stage by presenting 1) the current state of CALL and language teacher preparation and 2) the methodology used for the literature search.

It should be noted that for the purpose of this literature review, several references to CALL will be included to frame the general discussion since online language learning is a subset of this area and very little has been published specifically on online language learning. In most cases, these references to CALL used in this review deal with the use of technology over the Internet, which relates closely to the online language learning environment.

**Current State of CALL and Language Teacher Education**

In a 2007 keynote address at a leading CALL conference, Hubbard (2008) shared that CALL had increased its presence in second and foreign language teaching. He also asserted that language teachers are “pivotal players…[for] the future of CALL [since] they select the tools to support their teaching and determine what CALL applications language learners are exposed to and how learners use them” (p. 176).

Presently, a common approach to CALL in current language teacher education programs is to concentrate on the hardware and software issues rather than the pedagogy. According to Kessler (2006), much of the instructional technology preparation in teacher training programs focus on digital literacy or software specific orientation. These skills help
teachers to use technology but do not prepare them to use technology for language teaching. While there is a growing number of literature that provides an overview of CALL to teacher candidates, Hubbard (2008) reported that there is evidence of language teachers graduating with little or nothing in the use of technology in language teaching. Similarly, Abras & Sunshine (2008) and Jones and Youngs (2006:267) pointed out that teacher preparation in the United States for online, distance, or hybrid language courses is lacking. Abras & Sunshine also highlighted the inconsistencies in good practices and the lack of benchmarks for teacher training technology standards as concerns for the field of language teacher education.

Meanwhile, Hubbard and Levy (2006) were concerned that language teachers would be at a disadvantage if they are not adequately trained for CALL. As Hubbard (2007) pointed out, 39% of the positions listed on October 29, 2005 on a TESOL Career Center site mentioned CALL or technology skills as required or desirable. The number jumped to 60% based on listed positions on the same site five months later on March 22, 2006 (Kessler, 2006). Clearly, CALL preparation is needed in language teacher education programs.

In a survey through CALL-related listservs, Kessler (2006) found that graduates of TESOL programs expressed general dissatisfaction with their formal CALL preparation. 51% of the 240 respondents said their CALL training was “extremely ineffective” and 25% found it “somewhat ineffective.” Hubbard (2008) attributed the lack of formal CALL training to reasons including limited CALL teacher educators, lack of established methodology, insufficient infrastructure, standards, and time as well as unsupportive faculty who believed that technology training was an institutional responsibility. Even though many teacher trainers have done work independently in the area of CALL (Hubbard & Levy, 2006), Kessler (2006:23) claimed that “formal language teacher preparation programs have largely neglected to equip their graduates with the related knowledge and skills they need to enter today’s technologically advanced language classroom.” In fact, only a shocking eight of 50 North American TESOL graduate programs (as indicated on their websites in 2004) had any mention of a CALL component in their coursework and only three of these had a CALL course (Kessler, 2005). Kessler (2006) added that most teachers gained their CALL knowledge from informal or self-study rather than instruction.
The assumption that a teacher who is good at teaching in a face-to-face class can easily jump in and teach in this new medium is a common myth (Davis & Rose, 2007; Wood, 2005). Easton’s (2003) study of skills needed by distance learning instructors showed the need for the online instructor to have a paradigm shift in perceptions of instructional time and space, virtual management techniques, and ways of engaging students through virtual communications in addition to the communication skills already required for general effective classroom teaching. Additionally, Hampel and Stickler (2005) noted that online language teachers not only needed different skills from those of traditional language teachers in face-to-face classrooms but also different skills from online teachers of other subjects. The lack of non verbal clues in audio conferencing, for example, can be very challenging for online language teachers. Clearly, CALL teacher preparation needs to improve if we want the new generation of language teachers to be prepared for teaching in online environments. This literature review attempts to provide recommended steps for language teacher education programs based on identified skills needed for online language teaching. The next section outlines the methodology used to identify relevant and quality resources for the identification of such skills.

**Literature Search Methodology**

The areas of CALL, technology for language learning, and language teacher education have been greatly researched. However, research on effective preparation for online language teachers is scarce. Due to the limited publication pertinent to the topic of teacher education and online language teaching, the search for relevant literature became an exploration into three major disciplines: CALL, online/distance education, and teacher education. Using a methodology resembling a qualitative data analysis, this literature search involved iterative cycles of data collection, analysis and synthesis. Key publications dealing closely with the topic of this literature review (Chapelle & Hegelheimer, 2004; Hampel & Stickler, 2005; Stickler & Hauck, 2006a; Jones & Youngs, 2006) were used as the starting point. These articles were used to identify important skills needed for online language teaching. Additionally, relevant books (Felix, 2003b; Hubbard & Levy 2006) and special publication issues (CALICO Monograph Series, 2008 Vol. 7; CALICO Journal, 2006 Vol.
In the second round of review, critiques and ideas gleaned from prominent CALL specialists through related books and articles were also used to support and elaborate on the list of skills identified from the first round of review as there were limited research-based articles related to teacher training and online language learning. Search for articles (print and online) selected and reviewed for this cycle were conducted using the ERIC online data base with various combination of key words (key words: CALL, teacher education, distance education, online education, language learning, literature review) without the year restriction as well as a methodical manual search of individual issues in leading and reputable journals (e.g. CALICO Journal, CALL Journal, Language Learning & Technology). Because instructional technology is constantly evolving, the manual search of articles was limited to those published between 2000 and early 2008 to ensure that the most relevant issues in teaching CALL were covered. Additional relevant references gathered from the key publications from the first cycle were also reviewed in this round.

Although literature in the general area of online teaching and CALL is widely available, there are very limited resources specifically for the preparation of language teachers for online language teaching. This literature review is an attempt to address the scarcity of resources in the mentioned area by synthesizing research and thought pieces from CALL, online and distance education, and teacher education. This paper now presents its main discussion starting with a review of an online language teaching skills pyramid and a critique of the framework.

**Skills for Online Language Teaching**

Chapelle and Hegelheimer (2004) stressed the need to clarify the key competencies of language teachers in the 21st century to “effectively and critically engage in technology-related teaching issues...within a world that is decisively supported and interconnected by technology” (p. 300). Clarification of key competencies is crucial for online language teacher training since teaching language online requires skills that differ from traditional language teaching as well as teaching other subjects online. In this section, this literature review will
look at the type of skills for online language teaching. In the first part, Hampel and Stickler’s (2005) paper as introduced earlier, provides a framework to discuss the types of skills needed for online language teaching. In the second part, I will provide a critique of the pyramid and recommend a modified framework for online language teaching skills. Since research from the European context will be used to inform this literature review, the term “tutors” will be used interchangeably with the United States (US) equivalent, “teachers” or “instructors”.

Types of skills

In this sub-section, Hampel and Stickler’s (2005) paper is used to frame the discussion of skills needed for online language teaching since their paper was the first clear effort on the topic of teacher training for online language learning. Because few research-based articles relating to the training of online language teachers were located, non research-based literature was also used to provide supporting evidence for the skills discussed in this section.

According to Hampel and Stickler (2005), teaching language online requires skills that are different from those used to teach language in face-to-face classrooms. It is also different from teaching other subjects online. It requires more than just the knowledge of “which buttons to press in order to send an e-mail or which HTML coding is required to insert an image on a web page” (Bennett & Marsh, 2002:14). Bennett and Marsh identified two important pieces of knowledge beyond the technical level: (a) “identify the significant difference and similarities between face-to-face and online learning and teaching contexts”, and (b) “identify strategies and techniques to facilitate online learning and help students exploit the advantages in relation to both independent and collaborative learning” (p. 16). Besides that, community building skills to encourage socialization, active participation, and collaboration are equally important for online teaching (Jones & Youngs, 2006; Hampel & Stickler, 2005; McLoughlin & Oliver, 1999).

Based on their years of teaching languages synchronously in an online environment and experience in the training of online tutors, Hampel and Stickler (2005) attempted to identify the key competencies of an online language tutor. They presented a pyramid of skills (Figure 2.1) with seven key competencies ranging from lower level skills (e.g. basic ICT competence, specific technical and software competence, awareness of constraints and
possibilities) to higher level skills (e.g. online socialization, facilitation of communicative competence as well as creativity, choice, and selection). They said that the online language teaching skills needed to “build on one another in a kind of pyramid, from the most general skills forming a fairly broad base to an apex of individual and personal styles” (p. 316).

The first level of skills for an online tutor relates to technological skills. This includes the ability to deal with basic issues such as the use of keyboard, mouse, soundcards, and headsets as well as familiarity with common issues with ISP connections, firewall, internet browsers, plug-ins, etc. Chapelle and Hegelheimer (2004) added that the ability to troubleshoot basic browser problems was also important since most information is accessed through a browser interface and they advocated training through computer methods courses. The competence to use networked computers and the familiarity with basic applications are skills that have become prerequisites for effective online language teaching (Hampel & Sticker, 2005) and the general 21st century language teacher (Chapelle & Hegelheimer, 2004). These skills are often taken for granted and commonly left to the teachers to learn on their own, especially since there is a limited amount of time to cover everything else.

![Figure 2.1 Skills pyramid (Hampel & Stickler, 2005, p. 317)](image-url)
The second level of skill is to use specific software applications to teach languages online. These applications may include commercial software purchased by the institution (e.g. WebCT, Wimba, or Elluminate) and/or freeware and open source (e.g. Yahoo Messenger, Skype, or Moodle). Additionally, online teachers need to know a range of applications from course management software (CMS) to applications that specifically facilitate CALL activities and provide students with a range of communication opportunities. Chapelle and Hegelheimer (2004) specifically noted the importance of knowing how to use communication tools such as “chat rooms, bulletin boards, e-mail, and electronic mailing lists” to support the learners’ communicative competence through computer-mediated technologies in the area of language learning (p. 308). Additionally, the latest technologies have made it easier and affordable for teaching languages via audio and video conferencing. Skype and Yahoo Messenger, for example, offer free audio-video conferencing while webcams and headsets with microphones are cheap and can be easily purchased online or in stores.

However, knowing how to use the specific software applications is not enough. The third level of skills requires the online language teacher to understand the affordance and constraints of the specific applications. For instance, free software is plentiful but each has its strengths and drawbacks. ICQ, an example of free synchronous chat software, can be downloaded in different languages such as Arabic, Swedish, Dutch, French, Chinese, and Spanish (Compton, 2004). This is an extremely useful communication tool for online language learning since it supports different language scripts. However, Compton warned practitioners that their students may receive unsolicited messages and chat invitations from other ICQ users even though they are not on the student’s list because ICQ is an open chat channel. These unsolicited messages and invites may interrupt the task and could possibly pose as safety threats especially for younger learners. Teachers, however, can avoid them by having their students switch to the “Invisible Mode” after they have established connections with their assigned learning partners.

The fourth level of skills relate to online socialization. The quality of interpersonal interaction relies on the sense of community that has been established (Palloff & Pratt, 1999; Salmon, 2003). A sense of trust is particularly relevant in beginners’ language courses.
because learners often feel very insecure and unable to express themselves. Hampel and Stickler (2005) believed that extra care should be taken to foster positive online socialization and community so learners will not be afraid to be active participants. They added that socialization and community building in an online environment require skills that are very different from face-to-face classroom, so even “the most jovial and well-liked tutor of face-to-face courses” cannot automatically become a successful online teacher (p. 318).

Additionally, Davis and Rose (2007) warned that miscommunication in an online community can lead to tension. They stated that online teachers should have good communication skills that are even more critical for online environments due to the lack of visual cues. Jones and Youngs (2006) added that online teachers also need to know how to stimulate active participation and collaboration because they can facilitate online socialization and even help to maintain students’ interest in the subject matter and learning.

The literature contains a number of studies that support the importance of community in online language learning. A study on networked collaboration between non-native speakers (NNSs) of Spanish and native speakers (NSs) of Spanish in the US by Lee (2004) showed that language proficiency affected the quality of online negotiations and students’ motivation. The goal of the collaboration was to provide the NNSs with opportunities to use the target language outside the classroom while the NSs received experiences with online technologies as part of their course requirements. No effort was made to establish community between these two groups of learners prior to their task-based interactions. Survey results of the NNSs learners showed that the NNSs experienced anxiety and discomfort with the online experience. Additionally, NNSs learners expressed frustration in scheduling attempts and they believed that the NSs did not benefit from their collaborative experiences and may have felt frustrated or bored. These negative experiences could be minimized if the sense of community had been established prior to the task-based interactions. In particular, the sense of community and trust might help to alleviate the NNSs’ concerns of making mistakes if they did not feel judged or feel they were holding up the online conversation, which in turn may result in a more positive interpersonal interaction with high level interactions.

The fifth level of skills requires the online instructor to be an effective facilitator of communicative competence. This skill builds upon the successful socialization of students
and the promotion of social cohesion since Hampel and Stickler (2005) noted that meaningful communicative interaction “would hardly take place in a classroom without social cohesion and would certainly not provide successful practice opportunities for communicative encounters” (p. 318). They asserted that in communicative language teaching, interaction between participants is crucial and can be achieved in an online course through task design.

A study of a telecollaborative project between students of English in Germany and students of German in Australia by O’Dowd and Ritter (2006) provides evidence of the need to develop social cohesion and importance of task design. An intended topic of comparison of media coverage of a global event was misinterpreted as a debate of religion and resulted in superficial exchanges because a strong sense of community had not been established. Results showed that the task design and lack of social cohesion prevented the students from meaningful interactions. One student commented in his final evaluation:

Not everyone is interested in the Pope and/or religion. So our messages about this were very short and superficial…This disturbed the rather personal beginning of the exchange. It is definitely not a good choice as the second task for people who barely know each other. (O’Dowd & Ritter, 2006, p. 636)

The researchers concluded that the “task design, …[and] the students’ psychobiographical backgrounds led to interaction failures” (p. 637).

Creativity and choice are the sixth level of skills for online language tutors. Chapelle and Hegelheimer (2004) noted that “searching, evaluating and repurposing of materials” are important Web literacy skills that all 21st century teachers should have since the World Wide Web provides such a wide range of resources for teaching. For an online tutor, these skills are necessary to aid the selection of “good, authentic language learning materials…and [creativity in] designing online activities with the communicative principles in mind” (Hampel & Stickler, 2005, p. 319). Creativity is not only limited to the design of the materials but also with finding new uses for online tools. For example, most text and voice chat freeware applications were originally offered as social tools but they can be used to mediate communicative language activities. Hampel and Stickler also shared an example of creativity where a “yes” button in Lyceum, the institution’s synchronous audio-graphic
conferencing system, was originally intended for voting but later used as a signal of consent to a verbal statement.

In the event of working with pre-prepared materials, skills to select, implement, and adapt given tasks are necessary for successful online language teaching in addition to the critical understanding of affordances and constraints of the technologies and mediums of communication and interaction. Davis and Rose (2007:9) added that “an understanding of how and when to provide student support, how and when to provide opportunities for interaction, the appropriate selection and use of resources, and the development of resources to serve specific instructional purposes” are necessary skills for online teaching.

The seventh and highest level of skills for online language teaching includes the ability to develop a “personal teaching style, using the media and materials to their best advantage, forming a rapport with [the] students and using the resources creatively to promote active and communicative language learning” (Hampel & Stickler, 2005, p. 319). In essence, this level of skills requires the online tutor to master all the previous levels of skills listed in the pyramid. These skills do not come naturally and may require tutors with face-to-face teaching experiences to re-discover their teaching styles. Hampel and Stickler noted that inexperienced tutors may find the lack of body language restrictive at first but an increase familiarity and confidence with lower level skills can help them find new teaching styles. They also added that some problems encountered during online teaching may be similar or parallel to those in face-to-face classes but the solutions may be different. Thus, the online tutors have to develop new teaching styles that will be suitable to the medium of instruction.

Critique of Hampel and Stickler’s skills pyramid

In this sub-section, I will address the limitations of Hampel and Stickler’s (2005) skills pyramid and use them to propose a modified framework in the next section.

Hampel and Stickler (2005) presented their online teaching skills in a pyramid form to indicate that the skills “build on one another, from the most general skills forming a fairly broad base to an apex of individual and personal styles” (p. 316). They added that the lower level skills have to be achieved before the higher level skills can come to fruition. In doing so, there is an implication that these skills have to be developed sequentially. I would argue that some of these skills can be develop concurrently and do not necessarily have to come in
the order implied in the pyramid. For instance, acquiring specific technical competence and dealing with constraints and possibilities of the medium are both technology related issues. An online language tutor who is learning new software can also learn to deal with the constraints and possibilities at the same time. It may even be more beneficial to develop those skills together since all software applications have strengths and weaknesses and not all software is intended for online language learning.

Meanwhile, online socialization and facilitation of communicative competence are both pedagogical issues that can be dealt simultaneously or in any order since they relate to strategies of teaching. Online socialization is important because it helps to create a sense of community, which in turn helps to facilitate online interaction. Therefore, an online language tutor should learn strategies that will facilitate online socialization and promote interaction at the same time so learners can develop their communicative competence.

L2 acquisition may not necessarily require online socialization. Intrapersonal interactions that focus on the learner’s mind and interpersonal interactions between learner and content (Chapelle, 2005) do not require any online socialization with other learners or the tutor. Thus, the online language tutor should know how to facilitate L2 acquisition rather than online socialization. In this case, it is important for the online language tutor to focus on the curriculum, tasks, and the delivery method rather than the online community.

Besides from the limitation implied in the sequencing, the pyramid does not provide any indication of when an online language tutor is ready to teach. A look at the pyramid suggests that a tutor who has developed his/her own style of teaching has achieved the highest level of skills but it may not necessarily be at that level that a tutor is ready or allowed to teach. Yet, there are no guidelines from the pyramid to show when that should happen.

Hampel and Stickler (2005) stated that “online language teachers require different skills compared to online teachers of other subjects” (p. 312). However, only one skill (i.e. facilitating communicative competence) is specific to online language learning. In general, the pyramid provides a framework that appears to be applicable to any online teaching context. Other important skills and competencies of online language teaching such as application of language learning theories, online language assessment, and task evaluation
are not included. Knowledge of language learning theories, assessment and task evaluations are not only important for any language courses, they are also different for an online context. Therefore, it is crucial that a framework for online language teaching should address these skills.

This section began with a review of Hamel and Stickler’s (2005) pyramid of skills for online language teaching and continued with a review of its limitations. In the following section, an alternate framework for online language teaching skills will be provided based on synthesis of literature including the mentioned pyramid of skills.

**A Proposed Framework for Online Language Teaching Skills**

In this section, I propose a framework for online language teaching skills that is intended to guide language teacher training programs. This framework is based on synthesis of literature in CALL and teacher education. It attempts to address the limitations in Hampel and Stickler’s (2005) skills pyramid. The framework focuses solely on the skills based on the role of an online language teacher and excludes any other roles played by the learning institution, student services, or instructional technology services.

Abras and Sunshine (2008) called for benchmarks for technology in teacher training to include course design, content, pedagogy, technology as well as methodology and theory of second language learning. Figure 2.2 shows the proposed framework for online language teaching skills that attempts to address the suggested benchmarks. As indicated in the framework, there are three major sets of online language teaching: a) technology in online language teaching, b) pedagogy of online language teaching, and c) evaluation of online language teaching. The first set, technological skills, relates to knowledge and ability to handle hardware and software issues. Next, pedagogical skills refer to knowledge and ability to conduct and facilitate teaching and learning activities. Lastly, the evaluative skills refer to the analytical ability to assess the tasks and overall course and make necessary modifications to ensure language learning objectives are met.

Each of these sets has different skills that are essential for online language teaching. These skills are also organized into three levels of expertise, i.e. novice, proficient, and expert. These levels are not absolute but rather a continuum of expertise. The skills within
each level can be developed individually or simultaneously but they are necessary in order to proceed to the next level of expertise. For instance, any skills listed in any of the three sets (technology, pedagogy, evaluation) under the novice level can be developed in any order and combinations. However, these skills have to be developed before they can proceed to the next level of skills listed at the proficient level. Additionally, in order to limit the scope of this literature review, this framework only list a range of key skills that should be given primary focus but acknowledges that there may be other skills that can be added to the framework.

*Technological skills*

Technological skills in this subsection are divided into three levels of expertise, i.e. novice, proficient, and expert. At each of the levels, there is a main emphasis underlying the technological skills. The emphasis at the novice level is for the teacher to become a proficient user of technology. Familiarity with a range of technology can then help to increase the teacher’s confidence in using the technology for teaching purposes. At the proficient level, the emphasis is to be an effective judge of different technologies so he/she can choose the best technology given a certain set of conditions. This is similar to the 6th level skill (choice) listed in Figure 2.1. Figure 2.1 also lists creativity at the 6th level. In this proposed framework, creativity is separated from choice and reserved for the expert teacher who has become confident and successful at using, choosing, and modifying relevant technologies for online language learning.

At the first level, the basic technological skills as defined by Hampel and Stickler (2005) are necessary prerequisites for any novice teachers. This includes the ability to turn on a computer, use a mouse, and basic knowledge of simple applications, e.g. word processing and internet. Based on these basic skills, a novice online language teacher should proceed to be a proficient user of various technologies that could be used for online language learning. Since communicative competence is an important facet of language learning, the novice teacher should also learn about the differences between asynchronous and synchronous technologies, and be comfortable in using computer-mediated communication (CMC) technologies, which include text, audio, and video conferencing. Additionally, a novice teacher should also be familiar with CMS (e.g. Blackboard, WebCT, Moodle), and able to
Figure 2 Proposed Framework for Online Language Teaching Skills
navigate through one or more systems. While learning to use different software, the novice teacher should be able to identify and compare features in similar software (e.g. Yahoo Messenger vs. Skype or WebCT vs Moodle).

At the next level of expertise, a proficient teacher can build upon his/her knowledge as a technology user and be good at making choices. This includes familiarity with different software and having the ability to carefully select suitable technology to match the online language tasks. Also, the proficient teacher can find available software (freeware and commercial software) and make an informed decision based on the pros and cons of the software. Complementary to this skill is the ability to deal with the limitations of the chosen software and provide solutions to overcome the limitations. Also, the proficient teacher is capable of drawing on the software’s existing features to facilitate the language learning process including content delivery, online interactions, and course management.

Chapelle and Hegelheimer (2004) stated that all 21st century language teachers should be able to troubleshoot basic browser problems since almost all information will be accessed through a browser interface. They added that these teachers should also have expertise ranging from “creating basic Web pages [using WYSIWYG (What-You-See-Is-What-You-Get) programs] on one end of the continuum to programming an online course on the other end” (p. 307). A proficient online language teacher should have some ability to troubleshoot basic browser programs as recommended by Chapelle and Hegelheimer. Examples of these skills would include recognition of basic extensions (doc, png, exe, jpeg, mov) and being able to identify, download, and install appropriate browser plug-ins. As for web pages, a proficient teacher should at least be able to design basic Web pages using WYSIWYG programs as well as insert hyperlinks and links to media files.

Next on the expertise continuum, an expert teacher is able to creatively use and adapt existing technologies for online language learning tasks. Since many software applications were not originally created for online language learning, the expert teacher has to be creative in using the existing features to provide online interactions. For instance, Second Life, a 3D virtual world, was originally intended for social networking and fantasy gaming. Users can connect with other “residents” of this virtual world through voice and text chat. However, an expert teacher would be able to explore the use of Second Life for role-playing to provide
learners with opportunities for practicing language. Examples of creativity in such areas by expert teachers are evident through the creation of and participation in Second Life English (http://www.secondlifeenglish.com/news.php). In addition, the expert teacher is able to construct dynamic and interactive Web pages that can enhance online language learning activities as well as the delivery of content. He/she may also be able to create basic applications using programming knowledge.

**Pedagogical skills**

Similar to the technological skills, there is also an underlying emphasis for each level of pedagogical skills. At the novice level, the emphasis is for the teacher to acquire adequate information or knowledge. At the proficient level, the emphasis is on application of the knowledge that has been acquired at the novice level while the emphasis at the expert level is on creativity with knowledge and application.

Since many online language courses involve more than one student, there is a need for online community building and socialization. The novice teacher should therefore be aware of their importance and different strategies to promote them. Also, the novice teacher should be knowledgeable about different ways to facilitate communicative competence and online interaction. Besides that, the teacher should also know different language learning theories and strategies for online language assessment. Lyddon and Sydorenko (2008) for instance, presented a range of assessment tools ranging from computer-adaptive tests to CMC assessments for the four basic communication skills (listening, reading, writing, and speaking) that would be useful for online language learning assessment.

In addition to language learning theories and online language assessment strategies, knowledge of online language learning curriculum design is also important since learning language online is different from learning language in a traditional face-to-face setting. Lai, Zhao, and Li (2008) for example, proposed some design principles for distance foreign language environments that deal with the course communication component and the course structure component. Table 2.1 shows their proposed framework.
Table 2.1 Design Principles for Distance Foreign Language Environments (Lai, Zhao, and Li, 2008:90)

<table>
<thead>
<tr>
<th>Components</th>
<th>Principles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Communication</td>
<td>• Provide many opportunities for various forms of interaction with different interlocutors in both written and oral modes&lt;br&gt;• Facilitate high-quality interactions with multiple opportunities for negotiation of meaning and cultural understanding&lt;br&gt;• Provide clear instructions, course expectations, and technical support&lt;br&gt;• Provide quality feedback in a timely manner and encourage peer feedback&lt;br&gt;• Mediate interaction through various communication media and use different media for different interaction purposes</td>
</tr>
<tr>
<td>Course Structure</td>
<td>• Apply task-based instruction to foster a learner-centered learning environment&lt;br&gt;• Strive for focus on form and emergent, learner-based linguistic “instruction”&lt;br&gt;• Vary the course structure to cater to various learning needs and styles&lt;br&gt;• Conduct constant formative assessment to construct individualized learning support&lt;br&gt;• Incorporate activities that help learners to strengthen their ability to manage their learning&lt;br&gt;• Encourage learners to co-construct class resources and the learning environment</td>
</tr>
</tbody>
</table>

At the proficient level, the teacher should be able to choose suitable materials and tasks for online language learning. The proficient teacher is also able to adapt one or more language learning theories and course design frameworks for the online language learning context, and select materials and tasks accordingly. Additionally, the teacher is also able to assess language learning using a range of assessment methods.

Once a teacher has gained confidence in online language teaching and exposure to a range of tasks, activities, and materials, he/she may become more creative in using and adapting materials and tasks for online language learning purposes. Creativity may also be expressed in ingenious ways to facilitate online socialization and community building. At this point, a personal style of teaching as indicated in the 7th (highest) level in Figure 2.1 would emerge. The expert teacher is also more intuitive with formative assessment, i.e. able to identify learners’ progress easily based on learners’ language output, and able to integrate
several ways of language assessments through formative and summative methods. (see Lyddon & Sydorenko, 2008 for ideas on formative and summative online language assessment.)

*Evaluation skills*

A creative teacher may not necessarily be successful at teaching if the learning tasks do not lead to the desired outcomes. Moreover, as pointed out by Chapelle (2001), teachers need to know what kind of CALL tasks may be beneficial. Therefore, knowledge of CALL and/or online language learning tasks, software, and course evaluation are necessary for online language teachers so appropriate modifications can be made.

At the novice level, the teacher should have knowledge of different types of evaluation. For example, Chapelle (2001) identified three levels of analysis (software, task, and learner’s performance) to improve CALL evaluation. Firstly, aspects to focus on (but not limited to) software use include its impact on control, interactivity, and feedback. Secondly, the task should be evaluated based on its impact on learners’ online interactions and opportunities for negotiation of meaning. Thirdly, the learners’ performance can be used to evaluate if desired learning outcomes are met through the online tasks.

Knowledge of one or more suitable evaluation frameworks (e.g. Chapelle, 2001) is also important for evaluating the effectiveness of the CALL learning activities. For example, Chapelle also provided a framework to evaluate CALL task appropriateness (Table 2.2) that can be adapted for online language learning tasks. Chapelle’s framework uses six criteria to evaluate CALL task appropriateness, i.e. language learning potential, meaning focus, learner fit, authenticity, positive impact, and practicality. While this framework was intended to evaluate CALL tasks, it can be adapted to evaluate online language learning tasks. Additionally, it can help to inform the task design process. Besides knowledge about task and software evaluation, the novice teacher should also know different ways to evaluate the course. For example, knowing the difference between formative and summative evaluation and the functions of these evaluations are important for any course evaluation.

Based on the knowledge acquired at the novice level, the proficient teacher can learn to apply the different frameworks and use various strategies for task, software, and course evaluations. If evidence from the evaluations show that the learning outcome is not met, the
proficient teacher is able to rely on his/her pedagogical and technological skills to make the necessary modifications.

Table 2.2 Criteria for CALL task appropriateness (Chapelle, 2001:55)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language learning potential</td>
<td>The degree of opportunity present for beneficial focus on form.</td>
</tr>
<tr>
<td>Meaning focus</td>
<td>The extent to which learners’ attention is directed toward the meaning of the language.</td>
</tr>
<tr>
<td>Learner fit</td>
<td>The amount of opportunity for engagement with language under appropriate conditions given learner characteristics.</td>
</tr>
<tr>
<td>Authenticity</td>
<td>The degree of correspondence between the learning activity and target language activities of interest to learners out of the classroom.</td>
</tr>
<tr>
<td>Positive impact</td>
<td>The positive effects of the CALL activity on those who participate in it.</td>
</tr>
<tr>
<td>Practicality</td>
<td>The adequacy of resources to support the use of the CALL activity.</td>
</tr>
</tbody>
</table>

While the proficient teacher is capable of using one or more frameworks to evaluate the three areas (task, software, and course) on their impact on learning outcomes, the expert teacher is able to conduct the evaluation using integrative methods, i.e. combining several ways of evaluation. Moreover, the expert teacher is more insightful than the proficient teacher and is able to quickly identify the impact on learning outcomes based on his/her extensive knowledge of evaluative frameworks. Evaluation may even become a subconscious effort.

This proposed framework in this section attempts to address the limitations in Hampel and Stickler’s (2005) skills pyramid. This alternate framework divides online language teaching skills into three categories (technology, pedagogy, and evaluation) and describes the different skills at three levels of expertise (novice, proficient, and expert). This framework will be used to guide the recommendations for teacher education in a later section. The following section will review the different roles and responsibilities of an online teacher using a systems view.
Role and Responsibilities of an Online Language Teacher and other Stakeholders: A Systems View

This section reviews the role and responsibilities of an online language teacher using Moore and Kearsley’s (1996) systems view to show how the teacher and other stakeholders contribute to the success of online learning. This literature review will not analyze the roles played by the online teacher within the virtual classroom (e.g. facilitator, moderator, motivator, and modeler) because it has been done (see Harasim, Hiltz, Teles, & Turoff, 1997; Hauck & Haezewindt, 1999; Lynch, 2002; White, 2003). Instead, this literature review looks at online language learning as a system and the role of the teacher as one of the stakeholders in the learning process. This approach will allow us to understand how different components work together and who online language teachers have to work with and the scope of assistance other stakeholders can provide.

Moore and Kearsley’s (1996) systems view was used to describe the distance education (DE) system. Because online learning is a form of DE, the use of the systems view is easily adapted for this literature review. From this point onwards, any reference to DE by these authors and others will be used to refer to online language learning. According to Moore and Kearsley (1996),

a distance education system consists of all the component processes that make up distance education, including learning, teaching, communication, design, and management...[and] anything that happens in one part of the system has an effect on other parts of the system (p. 5).

They believed that the use of a systems view as a conceptual tool can help us to understand DE and it can act as a control mechanism that “ensures all the component processes are well integrated and interact with each other” (p. 6). Based on this systems view, neither the teacher nor the technology alone will make DE work because there are other critical components.

Moore and Kearsley (1996) identified eight key stakeholders in the DE system, i.e. student, course developer, site coordinator, tutor, proctor, student support services, management/administration, and teacher. Table 2.3 summarizes the stakeholders and their responsibilities. While each stakeholder has its own responsibilities, these responsibilities impact those held by the teacher. Additionally, the teacher’s responsibilities may overlap
with those of other stakeholders depending on the circumstances at the local and remote\(^1\) sites. Also, depending on the resources available at the remote institution, the roles of some stakeholders, particularly the site coordinator, tutor, proctor, and student support services, may overlap.

Table 2.3 Stakeholders in a distance education system and their responsibilities

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>Self-directing and have learner autonomy.</td>
</tr>
<tr>
<td>Course developer</td>
<td>Works in a team of specialists including technology, content, media, and</td>
</tr>
<tr>
<td></td>
<td>instructional design specialists.</td>
</tr>
<tr>
<td>Site coordinator</td>
<td>Communicates with the teacher, student, and the larger community, organizes and</td>
</tr>
<tr>
<td></td>
<td>manages local circumstances, provides learner support at local site for</td>
</tr>
<tr>
<td></td>
<td>administrative, technological, and content issues.</td>
</tr>
<tr>
<td>Tutor</td>
<td>Provides individualized instruction, grade assignments, and monitor student</td>
</tr>
<tr>
<td></td>
<td>progress.</td>
</tr>
<tr>
<td>Proctor</td>
<td>Proctors exams and quizzes at local sites.</td>
</tr>
<tr>
<td>Student support services</td>
<td>Counselor provides guidance; administrative staff provides routine administrative</td>
</tr>
<tr>
<td></td>
<td>assistance.</td>
</tr>
<tr>
<td>Management/ administration</td>
<td>Manages policy, planning, staffing, budgets, scheduling, resources, etc.</td>
</tr>
<tr>
<td>Teacher</td>
<td>Humanizes the learning environment, facilitates and encourages interaction,</td>
</tr>
<tr>
<td></td>
<td>organizes and presents information, and provides feedback.</td>
</tr>
</tbody>
</table>

As an online student, the responsibilities include self-direction and conducting learner autonomy. White (2003) stated that learner autonomy can be developed in two ways. The first approach emphasized learner training and the second emphasized on learners’ choice in opportunities and negotiation of meaning in social interactions. In the first approach, learner strategy training is especially important for CALL because language learners cannot be expected to take a significant amount of responsibility for their own learning if they do not know how languages are learned. As pointed out in Smidt and Hegelheimer (2004), some low level learners engaged in wrong input enhancements and they were less likely to use metacognitive strategies while listening to online academic lectures. These resulted in low success rates in comprehension tasks. Hubbard (2004) stressed that CALL learner training is part of the teacher’s responsibility to help students make “informed decisions about how to

\(^{1}\) “local” refers to where the online teacher is located while “remote” refers to where the DE student is located.
use computer resources effectively to meet their learning objectives” (p. 51). However, because learner training takes preparation and class time, teachers need to consider the pros and cons before implementing them.

The second learner autonomy approach emphasizes negotiation of meaning. White (2003) stated that learner autonomy includes the “capacity to negotiate and develop control of learning experiences while interacting with others in the learning community” (p.161). Therefore, teachers should ensure that there are ample interaction opportunities and provide sufficient guidance and support for learners in their selection of learning options.

The next stakeholder in the DE system is the course developer. Moore and Kearsley (1996) identified two common models for course design. The first was the author-editor model where the subject matter expert drafted the curriculum and an editor produced the final document. The second model was the course team model, which included technology, media, content, and instructional design specialists at different stages of the course development. Each model has its strengths and weaknesses. For example, the author-editor model is a faster and cheaper model but may lack the good instructional design features of the course team model. The role of the teacher can vary significantly depending on which model is used for the creation of the online language course. In many cases where the online language course is a new innovation that is not supported by the department or institution, the teacher may end up becoming the course developer and having to invest a lot of personal resources (time, money, and energy) to design the course by himself. The teacher should therefore have some knowledge of free or cheap resources that can be used for online language learning as well as some basic instructional systems design. In contrast, an online language course that is supported and implemented by the department may have access to resources needed for the course team model.

The site coordinator (SC) plays an important role in a DE system. His responsibilities can vary depending on the resources available at the remote site. However, his primary responsibility is to maintain excellent communication. Moore and Kearsley (1996) said that the SC needed to communicate well with the instructor so he can carry out the instructor’s plans. Additionally, the SC has to maintain good communication with the students so he can assist them with their needs. The SC may also need to communicate with the larger
community so information regarding the course can be disseminated to potential students. Because the SC is in charge of everything at the remote site, he needs to have some technical competence. Some basic technical knowledge required might include software/hardware installation and the ability to troubleshoot or recognize the problems so the appropriate specialists can be contacted. The SC also needs to have some content knowledge so he can discuss matters with the instructor and assist the students if necessary. If the SC has some content knowledge, it would be easier to understand the instructor’s instructions and “arrange local circumstances [at the remote site] to see the goal is achieved” (Moore & Kearsley, 1996:245).

In the US K-12 virtual schooling (VS) system, the SC is known as the facilitator who also plays the role of a DE course counselor where he advises students in their selection of DE courses based on their learning needs (Harms, Niederhauser, Davis, Roblyer & Gilbert, 2006). Additionally, Harms, et al, said that the facilitator may also serve as “a coach to prepare students for VS, including the development of organizational and other study skills necessary to be successful online learners” (p. 9). In other words, the facilitator might help students to develop their responsibilities for self-direction and learner autonomy. Harms, et al. also added that the facilitator needs to promote co-presence especially if there is more than one student at the same remote site. The promotion of co-presence can help to increase motivation and peer-support. These responsibilities are similar to those shouldered by the student or learner support services in some learning institutions. White (2003) listed three primary functions of learner support, i.e. cognitive, affective, and systemic. In the first two columns, Table 2.4 lists the functions and scope of learner support services according to White (2003). The third column in Table 2.4 lists the roles that hold similar responsibilities according to different studies to illustrate the overlap among the roles and responsibilities of site coordinators or facilitators, tutors, and student services.

Moore and Kearsley (1996) identified the tutor as a stakeholder in the DE system. They pointed out that some DE systems (especially correspondence courses and open university courses) that have limited or no student-student or student-instructor interactions often appoint a personal tutor to students. This tutor is usually neither the course designer nor the person who presents the course content. The responsibilities of this tutor are to interact on
a one-to-one basis with the student and to provide individualized instruction. White (2003) listed tutoring responsibilities under learner support services. She shared an example where a weekly one-to-one telephone tutorial allowed the tutor to support the student in the following manner:

- “negotiating learning targets for the week;
- identifying further materials for each learner based on individual needs;
- advice on learning routes and language learning strategies;
- feedback on performance- simple error correction offered instantaneously; evaluation and correction of pronunciation and intonation; summary of errors and correction of structures at the end of interchanges; evaluation of progress as a whole.” (White, 2003:178)

In addition to the mentioned support, the language tutor can also provide opportunities for oral practice through phone (Radic, 2000, 2001 in White, 2003).

In forms of DE other than correspondence and open university courses, the responsibilities of the tutor as listed by Moore and Kearsley (1996) such as grading assignments and monitoring student progress can be shouldered by the SC. In the state of Iowa in US, the online learning system, i.e. Iowa Learning Online (ILO) mandates the role of a student coach that is similar to Moore and Kearsley’s (1996) SC. In addition to the administrative, technical, and content responsibilities, the student coach is also responsible for monitoring student progress and providing reports to both the instructor and the students’ parents (see Iowa Learning Online, undated). This ILO student coach is also responsible for Moore and Kearsley’s proctor’s duties, i.e. proctoring quizzes and exams and managing the passwords for students’ access to the assessment tools. However, the ILO student coach does not grade the quizzes and exams. In a different Iowa context that is unaffiliated with ILO, the grading responsibilities are taken on by the SC using a rubric provided by the instructor (see Davis & Compton, 2005).

Besides counseling and tutoring services, White (2003) also listed technical support to be a systemic function of learner support services. Examples of technical support included informational technology orientation at the beginning of the course and subsequent support for technological matters throughout the course. This differs from the SC’s technical
responsibilities listed by Moore and Kearsley (1996), which focused more on the technical matters pre- and during instruction. White cited Radic (2000) who set up a technical help desk for students. He believed that it was essential to the effectiveness of the course because it not only helped to solve students’ technical problems but also established students’ confidence in the institution, the delivery mode, the teaching method, and the tutor/moderator.

Table 2.4 Functions and scope of learner support services and the overlap in roles

<table>
<thead>
<tr>
<th>Functions of Learner Support</th>
<th>Scope of Learner Support Services</th>
<th>Role as listed in studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>Tutoring</td>
<td>Tutor (Moore &amp; Kearsley, 1996)</td>
</tr>
<tr>
<td></td>
<td>Study groups and centers, actual and virtual</td>
<td>Student support services (Moore &amp; Kearsley, 1996)</td>
</tr>
<tr>
<td></td>
<td>Learning support (including study and exam skills seminars, 1:1 assistance)</td>
<td>Facilitator (Harms, et al, 2006) Student support services (Moore &amp; Kearsley, 1996)</td>
</tr>
<tr>
<td>Affective</td>
<td>Guidance and advisory services (including motivational counseling)</td>
<td>Facilitator (Harms, et al, 2006) Student support services (Moore &amp; Kearsley, 1996)</td>
</tr>
<tr>
<td></td>
<td>Residential schools²²</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Peer contact</td>
<td>Facilitator (Harms, et al, 2006)</td>
</tr>
<tr>
<td>Systemic</td>
<td>Enquiry and admission services</td>
<td>Facilitator (Harms, et al, 2006) Student support services (Moore &amp; Kearsley, 1996)</td>
</tr>
<tr>
<td></td>
<td>Course/academic information and guidance</td>
<td>Facilitator (Harms, et al, 2006) Site Coordinator (Moore &amp; Kearsley, 1996)</td>
</tr>
</tbody>
</table>

The next stakeholder in Moore and Kearsley’s DE system is the management/administration. This level of administrative duty differs from the administrative duties that are held by the SC or the learner support services. Generally, management/administration deals with the budget, resources, staffing, scheduling, policies and other institutional matters. At the remote site, the administrative duties are held by the SC and they include dissemination and distribution of content materials, record keeping, and

²² Residential schools in this context refer to those offered by the Open University, UK. “There are now more than fifty Open University courses running a residential school. These last from one day to a full week and are based at universities, hotels, conference and field study centres in the UK and mainland Europe. Language schools run in France, Germany and Spain.” (http://css2.open.ac.uk/resschools/AboutResSchools.aspx)
other administrative procedures relating to instructional matters. Meanwhile, learner support staff might provide administrative assistance that includes course registration, fees, and other administrative aspects of a course or program.

The case study of a high school partnership provides a good example of the three levels of administrative duties (see Davis and Compton, 2005). In this case study, a rural Iowa high school was unable to hire a chemistry teacher. The principal then negotiated with another Iowa high school to offer the course at a distance via the Iowa Communication Network (ICN), a two-way interactive video system with studio classrooms in all school districts and most high schools in Iowa. The two high school principals and school counselors determined the timetable of the course so students from both schools could work on the course at the same time. They also decided on the teacher that will teach the course and the amount of compensation provided to that teacher. Meanwhile, the SC at the remote site was in charge of administrative procedures such as receiving and distributing materials, record keeping, etc. On the other hand, the secretary at the remote school provided administrative assistance by making copies of a faxed paper quiz from the teacher.

The final stakeholder in the DE system is the online teacher. The responsibility of the online teacher is to develop co-presence in their virtual classroom so the learning environment feels less distant (Harms, et al, 2006; Moore & Kearsley, 1996). Building a learning community can promote group rapport and full participation from students. Hiltz (1994) reported that when an online community was successfully fostered, students said they learned more and felt closer to their peers and instructor compared to traditional classroom settings. Additionally, the online teacher has to facilitate and encourage active participation and high levels of interaction. Besides that, the online teacher has to be effective about providing feedback so the students can monitor their progress. All these require skills that have been discussed in the previous section.

Moore and Kearsley (1996) pointed out that the responsibilities of the online teacher not only differ from traditional classroom but also depending on which level of DE. They used Michael Mark’s (1990) typology that divided DE into four levels as listed in Table 2.5. An online teacher at the distance learning program will undoubtedly play more roles than those at the other three levels. For example, an online teacher of a single DE course in a
conventional learning institution may have to handle the administrative duties whereas a distance learning institution would have staff designated specifically for such matters. Additionally, an online teacher of a single course may have to personally provide technical, cognitive, affective and systemic support if students are not located at any remote sites where learner support services are available. In a distance learning institution such as the United Kingdom’s Open University, there may be no need for online teachers. Instead, the primary instructional role is the tutor who supports the students’ learning (see The Open University, undated).

Table 2.5 Levels of distance education and their definitions (based on Moore & Kearsley, 1996)

<table>
<thead>
<tr>
<th>Level</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance Learning</td>
<td>“activities carried out in a conventional college, university, school</td>
</tr>
<tr>
<td>Program</td>
<td>system, or training department whose primary responsibilities</td>
</tr>
<tr>
<td></td>
<td>include traditional classroom instruction” (pp. 2-3)</td>
</tr>
<tr>
<td>Distance Learning</td>
<td>“A special and separate unit within a conventional college, university, or</td>
</tr>
<tr>
<td>Unit</td>
<td>school system that is dedicated to distance learning activities” (p. 3)</td>
</tr>
<tr>
<td>Distance Learning</td>
<td>“The sole purpose of the institution is distance education [and] all</td>
</tr>
<tr>
<td>Institution</td>
<td>activities are exclusively devoted to distance education” (p. 3)</td>
</tr>
<tr>
<td>Distance Learning</td>
<td>“two or more distance learning institutions or units who share in either</td>
</tr>
<tr>
<td>Consortia</td>
<td>the design or delivery of program, or both” (p. 4)</td>
</tr>
</tbody>
</table>

This section used Moore and Kearsley’s systems view to review the roles and responsibilities of eight stakeholders in an online learning system. Each stakeholder plays an important role in making the system work effectively. Depending on the circumstances at the local and remote sites, roles and responsibilities of some stakeholders may overlap, which will in turn impact the responsibilities of the online teacher. Knowing the different components of the system and the scope of responsibilities of each stakeholder can help the online teacher identify who and where to turn to for assistance. Furthermore, such awareness can help the online teacher understand his/her own scope of responsibilities and other responsibilities that may need to be absorbed if certain roles are not present in the online learning system. The next section will provide recommendations for language teacher education programs based on the proposed framework for online language teaching skills (Figure 2.2) and the systems view of online language learning.
Recommendations for Language Teacher Education Programs

Presently, the main source of professional development in the area of online English as a Second Language (ESL) teaching is offered by the TESOL organization through its certificate program (See TESOL, 2008). The profession has also begun to note the need to identify effective pedagogical frameworks for teaching language online. A special journal issue by CALICO (Stickler & Hauck, 2006b) and collections of works such as Felix (2003b), Goertler and Winke (2008), and Holmberg, Shelley and White (2005) are examples of such efforts. Despite these gallant efforts to exemplify good practices of online language teaching through design, technological, and pedagogical issues, little emphasis has been placed on teacher education for the 21st century beyond the ability to integrate technology into the classroom. Specifically, little has been done to prepare language teachers for online language teaching. Using ideas from earlier sections such as the proposed framework for online teaching skills and the roles and responsibilities of stakeholders in an online language learning system, this literature review presents four recommendations for language teacher education to improve the state of preparedness of language teachers for online language teaching: a) developing online language teaching skills through existing courses, b) developing online teaching skills at different levels of expertise and responsibilities for different roles, c) revamping existing technology training, and d) implementing early virtual field experiences and virtual practicum.

Developing online language teaching skills through existing courses

As presented in the earlier section, online language teaching skills are divided into three categories: a) technology in online language teaching, b) pedagogy of online language teaching, and c) evaluation of online language teaching. Ideally, language teacher education should include technology, methodology, and evaluation courses that focus solely on online language teaching issues because online language teaching is very different from traditional language teaching. Realistically however, resource and time constraints would hinder such efforts from fruition at most language teacher education programs. This literature review does not recommend immediate comprehensive teacher preparation for online language teaching but rather a gradual and progressive change to prepare all language teachers for the possibility of a career in online language teaching. This change involves raising the level of
awareness of all language teachers regarding the potential of online language teaching and the knowledge level of basic principles and skills required for successful endeavors in this new system. If language teachers are interested after being exposed to the potential of online language teaching through their TESL or Applied Linguistics program, they could then pursue further professional development such as the certificate program offered by the TESOL organization (TESOL, 2008) or possibly a new certificate or specialization in existing TESL or Applied Linguistic programs.

The skills of incorporating socialization techniques and fostering an online community are difficult to achieve. Hampel and Stickler (2005) recommended that future online language teachers experience first hand the “need for building an online community” through training events in the medium. As Slaouti and Motteram (2006:89) put it, “teachers need to learn about online learning through online learning.” This first hand experience or situated learning will illuminate the strengths and limitations of the technologies for learning (Hubbard & Levy, 2006) as well as reduce tensions about the realities of real teaching situations (Egbert, 2006). Bauer-Ramazani (2006) shared how a CALL course was successfully offered fully online to help teacher trainees develop the necessary competencies for educational technology and apply them in their teaching situations, which ranged from TESL to K-12 classrooms. Additionally, the online course itself was carefully designed using principles of distance learning (e.g. Palloff & Pratt, 1998, 2003; Warschauer, 2002) to provide a model of good practice. Kessler (2006) and Peters (2006) called for the integration of CALL training into the overall language teacher training program including CALL or online language learning component within methodology and pedagogy courses, especially if there is not a CALL specialist available. Also, Hoven (2006, 2007) stressed the importance of modeling and practice to encourage familiarity with different technologies and their affordances. Thus, curriculum design and methods courses should therefore adopt an online or hybrid/blended approach where language teachers can experience how online social presence can differ from face-to-face social presence and practice online community building strategies. Also, supplementing traditional in-class experience with online experiences will help to highlight the need for “netiquette” and the importance of community building.
strategies that do not rely on visual cues. Besides that, they can also identify online learning design features that are effective and those that are weak.

*Developing online teaching skills at different levels of expertise and responsibilities for different roles*

The proposed framework for online teaching skills in the earlier section identified three levels of expertise, i.e. novice, proficient, and expert. Language teacher training programs can use this framework to identify the skills that should be developed at different levels of expertise and match that with their curriculum. Skills at the novice level, for example, should be taught in the earlier years of their programs while skills at the proficient level should be reserved for the later years. Meanwhile, the skills at the expert level may be slowly developed in the final years and gained through field and practical experiences. (See also the recommendation for early virtual field experiences and virtual practicum below.)

In addition to the different levels of expertise, language teacher training programs should also prepare their teachers for the possibility of different roles in an online language learning system by integrating knowledge of online teaching skills at the novice level into all existing programs. While not all teachers are likely to become online language teachers, some might find themselves as elected site coordinators or tutors in their future workplace. Therefore, language teachers should know what roles and responsibilities exist in online learning systems and how the different components work together as a system. Additionally, having basic online teaching skills will prepare language teachers for the possibility of supporting an online language learner at a remote site. If all language teacher programs integrated the development of novice teacher skills into their curriculum, this could ensure that the language teachers could take on site coordinator or tutor roles if necessary.

*Revamping existing technology training*

Language teacher training programs should consider providing mandatory technology training for CALL purposes early in the program. Hegelheimer (2006:117) believed that “a mandatory technology course early in a [language] teacher training program” as a technology foundation can encourage its students to integrate technology more fully. He feared that technology electives taken late in the teacher training program would limit opportunities for technological proficiency integration in the training process. He reported that a mandatory
technology course in a TESL MA program showed positive impact on its students as they were not only “more computer-literate and able to construct instructional web resources,…but also more adept at using and critically evaluating technology in their teaching” (p. 125). Results also showed that students were integrating technology in their teaching assignments (as teaching assistants) by creating relevant extensive projects in their own coursework. Also, this recommendation would be more favorable than general technology electives in other departments since the course would focus on TESL. As Hoven (2007:137) pointed out, teachers’ adoption of change and innovation are more likely “when they can see positive benefits in terms of direct relevance to their content area, usefulness from a practical task perspective, and increased effectiveness for their day-to-day classroom teaching.” Additionally, by mandating this course early in the program, teacher trainees could benefit from the knowledge and skills throughout the rest of their program and experience increased confidence in teaching with technology unlike the participants in Peters (2006) who expressed confidence in technological competencies after a fourth-year technology integration course “yet still felt that they were not ready to integrate technology in the language classroom” (p.163).

While a mandatory technology course is a good recommendation, an alternative is to integrate CALL technology training into existing courses. Peters (2006) and Desjardins and Peters (2007) thought that a single course in technology integration may produce quick technical knowledge and promote the use of technology for teaching rather than the integration of technology in the curriculum. While Desjardins and Peters agreed with Hegelheimer (2006) that a mandatory technology course should be offered early in the program, she added that this course was usually limited to technical aspects and could send an unwanted message that “technology is an add-on rather than an integral part of the [teacher education] program” (2007:5). Simple steps can be taken to avoid this situation. For instance, basic technological skills and knowledge of specific applications taught in existing computer methods courses can be enhanced with discussions of affordances and constraints in specific situations, particularly online language learning systems. Additionally, assignments, projects and tasks involving the use of technology for language learning should incorporate principles of a selected language theory. For example, using an experiential
modeling approach in a technology and language learning course, Hoven (2006, 2007) incorporated the use of blogs, wikis, and e-portfolios, which highlight the principles of social constructive learning. Hoven (2007:137) stated that the experiential modeling approach allows the immersion of students in the use of the technologies while allowing them the experience of “practical application of the theory in their own learning.” Other examples include the training program by Hampel and Stickler (2005) where they used animated online tutorials, specific training for applications, and discussions of possibilities, constraints, and implications of the electronic medium for online language teaching in their training program to address the lowest levels of skills, i.e. technological competence.

**Implementing early virtual field experiences and virtual practicum**

Language teacher training programs can consider offering all their teacher trainees an early virtual field experience in online language learning. This virtual field experience would happen in the early stages of the program before any student teaching experience and provide opportunities for observation and “work with real students, teachers, and curriculum in natural settings” (i.e. online environments) (Huling, 1998). Such experiences allow teacher trainees to personally experience and observe aspects of online language teaching and online interactions through careful guidance and mediation. These carefully guided observations will provide them “with the experiences necessary to build the complex schema required” to be an effective online language teacher, site coordinator, or tutor (Huling, 1998:3).

Because observation alone cannot provide a rigorous experience (Davis & Rose, 2007), and does not result in substantive learning for effective teaching (Huling, 1998), early virtual field experiences alone are insufficient to prepare teacher trainees for online language teaching. Those who have experienced early virtual field experiences and continue to express interest in a career in teaching languages online should then participate in a virtual practicum. This virtual practicum should be offered in the final stages of the program after teacher trainees have had more exposure to online language teaching skills at the proficient level through methods, technology, and other relevant courses.

Recommendations provided in this section are based on the proposed framework for online language teaching skills (Figure 2.2) and roles and responsibilities of stakeholders in an online language learning system (Table 2.3). These recommendations stress a need for
ALL language teachers to acquire some basic online language teaching skills (at the novice level) so they are at least able to serve as site coordinators or tutors in their future teaching capacity. Those who wish to pursue careers as online language teachers should proceed to gain more knowledge and skills through courses that include the development of online teaching skills at the proficient and expert levels and relevant experience through virtual practicum.

**Summary and Conclusion**

This paper reviewed online language teaching skills and provided a critique of an existing skills framework and highlighted the complexity of identifying online language teaching skills. Online language teachers need to acquire skills beyond technological competence in order to teach effectively in this online environment. While some skills such as technical and software specific skills are easy to learn, others skills such as facilitating online socializing and community building can be more challenging. Nonetheless, these skills are essential in order to promote social cohesion that is necessary for meaningful communicative interaction. A proposed framework for online language teaching skills covering three categories of skills (technology, pedagogy, and evaluation) at three levels of expertise (novice, proficient, and expert) is provided to guide language teacher education programs.

Additionally, a review of roles and responsibilities of stakeholders using a systems view is included to show how different components work together to promote effective online learning. In any online language learning system, the online language teacher is likely to work alongside other stakeholders. Each stakeholder bears different responsibilities. Depending on the circumstances and available resources, online language teachers may need to fill in the gap by shouldering additional responsibilities. Online language teachers should be aware of the different roles and responsibilities in the online language learning system so they are able to refer to the appropriate resources as well as identify missing gaps and take necessary actions.

While online language learning has become more possible with the increase in communication tools and the number of online language courses is increasing, teacher
training at its present state has not focused on preparing language teachers for the challenges of teaching in an online environment. Since researchers and practitioners have warned against the assumption of a natural transition in teaching skills from a face-to-face classroom into an online environment, teacher educators need to pay more attention to the preparation of future language teachers for this new learning system especially considering that the efforts and cost of creating online materials “can be wasted without the adequate training of teachers to present and support the learning” (Hampel & Stickler, 2005, p. 312). As Salmon (2003) stated, “Any significant initiative at changing teaching methods or the introduction of technology into teaching and learning should include effective e-moderator support and training, otherwise its outcomes are likely to be meager and unsuccessful” (p. 80). Thus, this literature review ends with recommendations for teacher education programs on how to support the change in learning system through integration of online language teaching and learning related issues in existing curriculum design and methods courses. After all, online language teachers cannot be expected to become effective based on training meant for face-to-face classrooms when these two environments involve different skills and responsibilities. More research needs to be done to identify these skills and responsibilities so that language teacher preparation programs can continue to improve and serve the needs of future online language teachers.

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The Open University (undated). *Your tutor.* http://www.open.ac.uk/about/ou/p5.shtml


Abstract

Pre-service teachers’ personal histories as students and their preconceptions, misconceptions, and concerns can influence pre-service teacher training experiences. This study reviewed literature on conceptual change and proposed a framework to help pre-service teachers accept Virtual Schooling (VS) as an alternative educational format. This study also used secondary data from a curriculum intervention to analyze common preconceptions, misconceptions, and concerns. Data gathered include pre-service teachers’ personal journals and responses to a set of materials related to VS in part of an introductory field experience course at a large Midwestern university, an interview with the course instructor, and the researcher’s journal. Analyses of the responses and personal journals revealed several common preconceptions, misconceptions, and concerns such as career threat, viability of VS, academic dishonesty, equity, interactions, teacher feedback and lack of rigor. Findings showed that prior experiences with VS, resources and activities, and motives, goals, and institutional sources can influence the conceptual change process.

Introduction

Online distance education in the United States (U.S.), also known as Virtual Schooling (VS) is growing exponentially in the 21st century (Barbour & Reeves, 2009). Recent literature (Ferdig, Cavanaugh, DiPietro, Black, & Dawson, in press; Harms, Niederhauser, N.E. Davis, Roblyer, & Gilbert, 2006; N.E. Davis & Niederhauser, 2007; N.E. Davis & Rose, 2007; Hannum, Irvin, Lei, & Farmer, 2008) has highlighted emerging roles in virtual classrooms—besides the VS teacher, for example, the VS site facilitator and the VS instructional designer. Even the role of the VS teacher is different from that of the traditional classroom teacher. According to N.E. Davis and Rose (2007), many “virtual schools and other organizations that offered online courses and other forms of distance education to K-12
students were eagerly seeking to recruit new staff to match the demand for high quality VS in many U.S. states” (p. 7). These changes have placed new requirements on teachers entering these 21st century environments.

Teacher education programs, however, have a gap, leaving most new educators unprepared for the new competencies required to teach in virtual classrooms. (Barbour, Kinsella, & Toker, in press; N.E. Davis & Ferdig, in press; Smith, in press). Smith, Clark, and Bloomeyer (2005) reported that many “teachers currently teaching in online environments lack both the theoretical and practical understanding and are ‘learning on the job’” (p. 59). The National Educational Association (NEA) (n.d.) was concerned that the new generation of pre-service teachers did not see the significance of technology to extend classroom learning even though they were millennial learners who grew up with computers and Internet technology. The NEA added that most teacher preparation programs “rarely include courses either about online teaching, or conducted through distance teaching” and most of the 86,000 new teachers enter the profession each year without online teaching skills in their professional repertoire (p. 3). Since virtual school experiences over the past decade have shown that effective virtual teachers have qualities and skills that often set them apart from traditional teachers, it would be foolish to assume that “people who have never taught in this medium can jump in and teach a class. … A good classroom teacher is not necessarily a good online teacher” (Wood, 2005, p. 36). N.E. Davis and Rose (2007) said that there are common misconceptions about VS, e.g., the expectations of virtual schools that “any regular classroom teacher… [could be] qualified to teach online” and “newly qualified teachers who learn about virtual schooling in their pre-service programs will be ready to teach online when they graduate” (p. 8).

Along with the emergence of VS as a new mode of education in the 21st century school, is a range of contentious beliefs and misconceptions about the virtual schools (Charania, 2009 in preparation; North American Council of Online Learning (NACOL), n.d.), professional and organizational development (N.E. Davis & Rose, 2007) as well as equity issues (Rose & Blomeyer, 2007). N.E. Davis and Rose (2007) reported that there were many misconceptions of VS because VS had only become a “widely accepted practice within the last five years” (p. 4). Additionally, the lack of standards and benchmarks in distance
education courses may have led to serious misconceptions about the quality of online and/or distance learning. Furthermore, pre-service teachers who may have had negative or poor experiences with online or distance learning in the past would certainly have preconceptions about VS that need to be addressed in the teacher preparation programs. Only few have experienced good models of VS. Therefore, it is unsurprising that there is a widespread misconception of VS as a poor substitute for a brick and mortar classroom (Barbour & Unger, 2009; Compton, Follett, & Demiraslan, 2007; Charania, 2009 in preparation; N.E. Davis & Rose, 2007).

**Background of and Need for this Study**

To date there have been few attempts to include the pedagogies required for teaching in VS within teacher preparation (N.E. Davis & Ferdig, in press). There is also a lack of research on the preconceptions, misconceptions, and concerns of pre-service teachers about VS. If pre-service teachers rely on their personal histories as students to conceptualize their ideas of teaching, they may not fully understand how VS works and how it will impact their future careers. If their preconceptions, misconceptions, and concerns are not addressed early in their teacher education program, they may end up with limited teaching skills needed for the 21st century. Furthermore, Feiman-Nemser and Remillard (1996) warned that even though teacher educators have the intention of changing misconceptions, many pre-service teachers leave teacher preparation with their beliefs intact causing them to limit the consideration of new ideas and action. Therefore, it is vital that these issues are addressed early in their program so they can develop a better understanding about VS as a prominent alternative education mode.

Several efforts through a federally sponsored project were implemented to help increase pre-service teachers’ awareness of VS as an alternate education concept (Compton, in press; Compton, N.E. Davis & Mackey, in press; N.E. Davis, Roblyer, Charania, Ferdig, Harms, Compton, & Cho, 2007). An innovative national project to develop a model for US teacher education that included VS as an alternative mode of schooling created the opportunity for this case study. The project “Teacher Education Goes Into Virtual Schooling” (TEGIVS) was a three-year project led by Iowa State University’s (ISU) Center for
Technology in Learning and Teaching and was supported by the U. S. Department of Education’s Fund for Improvement of Postsecondary Education (FIPSE). In addition to ISU, project partners included the University of Florida, the University of Virginia, and Graceland University. The goal of the project was to prepare pre-service teachers to implement effective VS curricula in three VS roles: facilitator, teacher, and designer. As part of the project’s goals, a team of collaborators consisting of VS teachers and consultants, teacher educators, a field experience director, and a field experience supervisor from partner teacher education programs actively participated in discussions to conceptualize new curriculum that would help to improve the state of preparedness of pre-service teachers for VS. As a result, two new innovations were implemented in the field experience components of the pre-service teacher education program: a) virtual seminars on VS incorporated into an existing course in pre-student teaching experience, and b) virtual early field experience.

This paper limited its scope to part of the data in one of the interventions to identify the common preconceptions, misconceptions, and concerns related to VS held by pre-service teachers based on their responses in one of the virtual seminars on VS and to look at how prior experiences with VS and the engagement with the given resources impacted the conceptual change. A separate paper documented the implementation and impact of a pilot virtual early field experience created to provide pre-service teachers with opportunities to observe an award-winning exemplary virtual teacher and her virtual classroom (Compton, Davies & Mackley, in press; Compton, in press). This paper investigated the common preconceptions, misconceptions, and concerns as believed by pre-service teachers at a large Midwestern university and proposed a framework to facilitate the conceptual change of pre-service teachers with respect to VS. In addition to an analysis of secondary data from pre-service teachers, the study was also informed by the reflections of the instructor of the course and his teaching assistant who was also the researcher. Two general questions were developed to guide the data analysis and interpretations:

1. What were the pre-service teachers’ common preconceptions, misconceptions, and concerns relating to VS?

2. How did the pre-service teachers’ prior experiences and interaction with the given resources impact their conceptual change?
Literature Review

This section reviewed relevant literature from different areas of study including science education, general pre-service teacher education and pre-service teacher technology education. It highlighted the importance of pre-service teachers’ personal histories as students and the influences they have on their professional studies. It also reviewed the theory of conceptual change and how it had been used in these different areas of study. Finally, this section drew upon the reviewed studies and their frameworks, and concluded with a proposed framework for helping pre-service teacher increase their awareness and knowledge about VS as an alternative form of education. The first sub-section looked at the influence of pre-service teachers’ personal histories as students on their conceptions of education.

Personal histories and pre-service teacher education

Studies on personal histories and pre-service teacher education (Knowles & Holt-Reynolds, 1991; Knowles and Cole, 1996) have shown that pre-service teachers rely on their personal histories to shape their conceptions of school, teachers, students, learning, and teaching. They defined personal histories as experiences that “mold the educational thinking of pre-service teachers” including the varied experiences they bring into teacher education (Knowles & Holt-Reynolds, 1991, p. 89). Knowles and Holt-Reynolds (1991) stated that the experiences “of family, of learning, and of being in school” accumulate and integrate to “form a cohesive and coherent belief system,” which pre-service teachers use to make purposeful choices about how they will behave as teachers (p. 87). They added that teacher education is different from other professional fields like law, architectural, and medicine because pre-service teachers have gone through twelve years of “apprenticeship of observation” in schools as students unlike lawyers, architects, and physicians who have not been immersed in their future profession prior to entering their professional schools. They believed that these influences of observing and participating in “status quo” school and university classrooms have created a unique tension in teacher education because these personal histories can shape the conclusions pre-service teachers reach as they participate in their teacher education program. Knowles and Holt-Reynolds explained that pre-service
teachers can be resistant to ideas presented in their program because they use “alternate and potentially dysfunctional rationales for interpreting classroom events” and instructional decision making (p. 88).

In their investigation of pre-service teachers’ personal histories, they found that pre-service teachers relied and trusted their previous memorable student experiences as models and used these critical incidents as a framework and as a strategic filter to evaluate the potential of ideas presented to them in their teacher education. They also use critical past experiences to construct an imagined classroom “to predict the value of new strategies, theories, or principles of instructions” and participate in a mental role-play where they “explore predictions about what their own teaching might look like” (p. 91). Also, they relied not only on good but also bad experiences as students as a base for modeling and extending their preferred future teaching practices. Overall, the research showed that pre-service teachers’ past experiences as students contribute to their personal histories that they bring with them into their teacher education program and these personal histories influence their new experiences including how they view and accept pedagogical concepts during their teacher education. The next sub-section reviewed the theory of conceptual change from science education and how conceptual change can be facilitated.

Conceptual change and science education

The concept of VS is new to many pre-service teachers. In order to increase their awareness of VS, conceptual change has to occur. The theory of conceptual change commonly used in science education states that beliefs are changed when pre-service teachers recognize the discrepancies between their preconceptions and new ideas of teaching and learning (Posner, Strike, Hewson & Gertzog, 1982; Strike & Posner, 1985, Strike & Posner, 1992). Posner, et al. (1982) defined preconceptions as ideas or notions about a specific topic or issue possessed prior to any formal instruction on the matter. They were concerned that preconceptions were often inaccurate and incomplete. They added that preconceptions could lead to a resistance to change and argued that students need to experience a conceptual change so they can alter their misguided beliefs. According to Strike and Posner (1992), there are four conditions for a successful conceptual change:
o “There must be dissatisfaction with current conceptions [because learners will not alter their preconceptions] unless and until they see them as having become dysfunctional

o A new conception must be intelligible [because learners will only] begin to explore a new concept only if it makes minimal sense to them

o A new conception must appear initially plausible [so that it can at least] appear as a candidate for the truth

o A new conception should suggest the possibility of a fruitful research program [and] suggest ways of approaching the world and open new avenues of inquiry.” (p. 149)

Strike and Posner (1985, 1992) were influenced by literature on misconceptions, which suggested that learners come to school with many pre-formed ideas about scientific matters and do not approach the subject of science as blank slates. They noted that a misconception is “not merely a mistake or a false belief” but rather, “a candidate for change” because it either plays an organizing role in cognition or is dependent on an organizing concept (pp. 152-153). They also warned that misconceptions are highly resistant to change because concepts exist not in isolation but rather they are semantically and syntactically interdependent for meaning. In other words, to alter one concept, learners need to alter other concepts as well, and unless other concepts are altered, the misconception will remain. They added that misconceptions tend to have built in ‘defense mechanisms’ that could lead learners to “perceive the world in ways that are inconsistent with alternative concepts and that support the misconception” (p. 154).

In 1992, Strike and Posner attempted to revise their theory of conceptual change. In their revised theory, they acknowledged that other factors such as motives and goals, and the institutional and social sources may influence the learner’s “conceptual ecology,” which consisted of cognitive artifacts such as “anomalies, analogies, metaphors, epistemological beliefs, metaphysical beliefs, knowledge from other areas of inquiry, and knowledge of competing conceptions” (p. 150). They added that teachers needed to consider the kinds of cognitive artifacts learners possessed because these artifacts can either “promote or frustrate
progressive conceptual change” and can influence the types of resources and tasks teachers use for instruction to facilitate conceptual change (p. 150).

Overall, the theory of conceptual change states that preconceptions can be addressed if the new concept is presented as intelligible, plausible, and fruitful. It also acknowledges external influences such as motives and goals, and the institutional and social sources. The following sub-section looked at how the theory of conceptual change was applied to general pre-service teacher education to help pre-service teachers accept ideas of teaching and learning that contradict their preconceptions.

Conceptual change and general pre-service teacher education

J. Davis (1991) pointed out that (mis)conceptions about non-scientific concepts are widespread but research on conceptual change in other areas besides science education is scarce. In pre-service teacher preparation, some researchers (Knowles & Holt-Reynolds, 1991, Dole & Sinatra, 1998, Tillema & Knol, 1997; Pintrich, Marx, & Boyle, 1993) have integrated this theory into pre-service teacher preparation courses to help pre-service teachers accept alternative beliefs about teaching and learning.

Pre-service teachers bring preconceptions from their personal histories with them into the teacher preparation program. With more than thirteen years of experience in classrooms and observing teaching from a student’s lens, these pre-service teachers have preconceptions about teaching (Ball, 1988; Feiman-Nemser & Featherstone, 1992; Feiman-Nemser & Remillard, 1996; Weinstein, 1988). These preconceptions may cause them to have preconceived images that are at odds with realities and need to be challenged and corrected (Knowles & Cole, 1996) because they can significantly influence what they learn and accept as valid knowledge in teacher education (Bird & Anderson, 1992, Borko, Livingston, McCaleb & Mauro, 1988, Calderhead, 1991; Feiman-Nemser & Remillard, 1996; Kagan, 1992; Tillema & Knol, 1997). After researching the different kinds of knowledge and beliefs of pre-service teachers and how they interact with teacher education curriculum, Calderhead (1991) concluded that the many years of studenting caused pre-service teachers to embrace naïve and uncomplicated beliefs about teaching. He added that these beliefs were also very different and do not necessarily reflect good teaching.
Because U.S. has no national curriculum, resulting in the teacher’s freedom and latitude to teach as they deem most appropriate and efficacious, pre-service teachers enter their teacher education programs with a wide range of preconceptions and misconceptions about teaching and learning. This led Knowles and Holt-Reynolds (1991) and Howey and Zimpher (1996) to stress the need to focus on addressing pre-service teachers’ beliefs about learning and learning to teach. Knowles and Holt-Reynolds (1991) warned that pre-service teachers’ past classroom experiences as students are more influential than any classroom discussions in their teacher education programs. They added that pre-service teachers should be given opportunities for “acknowledging and understanding their previously unexamined, tacit beliefs” and opportunities to develop alternative beliefs (p. 103). Likewise, Howey and Zimpher (1996) shared that “a fundamental principle to guide both learning and learning to teach is to begin where one is” (p. 483). In other words, attention needs to be given to the knowledge and beliefs brought in by pre-service teachers. A prominent practice found in writings on field experiences is dialogue in a weekly seminar setting in which pre-service teachers and university faculty can reflect on experiences through conversations (Applegate & Lasley, 1982; Tabachnick & Zeichner, 1984; Zeichner & Liston, 1987). These seminars provide the opportunities to expose misconceptions, fears, and frustrations (Carter & Anders, 1996).

Tillema and Knol (1997) believed that new information given to pre-service teachers often does not stimulate their pedagogical reasoning. They developed two sets of materials based on a five-step Conceptual Change (CC) approach that integrates pre-service teachers’ preconceptions about teaching: 1) activation of prior experiences, 2) introduction of new information, 3) active exploration, 4) strengthening of understanding, and 5) discussions and idea exchange. They proceeded to compare this CC approach with the Direct Instruction (DI) approach, which explicates new knowledge clearly and requires study through “repetition and frequent practice until sufficient mastery is achieved” (Tillema & Knol, 1997, p. 580). They implemented two programs each with two parallel teaching modules to explain the teaching strategies of DI and CC.

Using a pre-and post-vignette test and a teaching-belief test, they tested both approaches as part of regular courses and gathered data from three teacher education
institutions. They found that there was only a small change in pre-service teachers’ beliefs about teaching. While it was not surprising that the belief change under the DI program was negligible since it did not deal explicitly with student teacher beliefs, they were surprised that the CC approach did not result in belief change either. Their further analysis, however, showed that a majority of the pre-service teachers did change their initial position either in the direction of CC or DI. They concluded that the CC program did lead pre-service teachers to a greater awareness about their beliefs but did not convince them of either approaches. Essentially, it “stirred, but did not restructure” (p. 591). They reasoned that the lack of a unidirectional change was due to the duration of exposure, which was too brief. While their study did not find any change in beliefs about DI or CC, the researchers did find that the pre-service teachers could apply the principles of both approaches accordingly. Thus, they concluded that if beliefs were unchanged, behavioral change would only be superficial and would not be sustainable.

Overall, the studies showed that pre-service teachers can change their preconceptions about teaching and learning if they were presented with opportunities and resources to address their preconceived ideas as well as the alternative ideas. The next sub-section reviewed studies that applied the theory of conceptual change into pre-service teacher technology education to help pre-service teachers consider different approaches to technology education.

*Conceptual change and pre-service teacher technology education*

Few researchers have looked at conceptual change in pre-service teacher education. Even fewer (Niederhauser, Salem & Fields, 1999; Sadera, 2001, Sadera & Hargrave, 1999) have looked at conceptual change in pre-service teacher and technology education. The first two studies focused on examining pre-service teachers’ reactions toward behaviorist and constructivist instruction in a technology classroom. Both studies showed that participants’ conceptual change progressed at different rates depending on their preconceptions and willingness to reflect on their personal learning experiences. Niederhauser, et al. (1999) found that pre-service teachers were more motivated and learned better when they used the constructivist approach, while Sadera (2001) discovered that those with pre-existing preferences for the behaviorist strategy displayed stronger conceptual change than those with
holistic or constructivist preconceptions. Sadera (2001) added that extended time for continuous exposure would be needed to facilitate better understanding of constructivism. Meanwhile, Sadera and Hargrave (1999) examined pre-service teachers’ preconceptions and conceptual development about educational computing. They found that pre-service teachers possessed simplistic preconceptions about the role of technology in teaching and learning, and their computer competence, epistemological beliefs, and attitudes towards computers influenced their preconceptions about educational technology.

Using Posner, et al.’s (1982) conceptual change theory, Sadera and Hargrave (2005) modified and proposed a three-stage conceptual change framework for pre-service teacher technology preparation, i.e. pre-dissatisfaction, dissatisfaction, and post-dissatisfaction. In the first stage of pre-dissatisfaction, learners acknowledge their pre-existing beliefs about educational technology. Sadera and Hargrave believed that pre-service teachers have not consciously contemplated about their beliefs and therefore are not cognizant of their beliefs. Therefore, they must be directed to “access, engage, and activate their basic beliefs about teaching and learning,” followed by their beliefs about technology and its role in teaching and learning (p. 297). Next, learners acquire relevant knowledge about the alternative concept in the dissatisfaction stage and compare the new concept with their preconceptions. In this stage, learners must be challenged to reconsider their beliefs in relation to the new concept. In order to do so, learners have to be exposed to information that will ignite dissatisfaction about their preconceptions. This is similar to “dissatisfaction,” which is one of the four conditions the original conceptual change theory (Posner, et al., 1982, Strike & Posner, 1992) that described dissatisfaction as critical to the reconceptualization of their preconceptions. Sadera and Hargrave emphasized that instructional activities need to be engaging and require pre-service teachers to “articulate deliberate and definitive positions regarding their beliefs...[and] formulate rational arguments to defend and advance their positions (p. 298). Finally, the post-dissatisfaction was based on the idea that even if a new concept was understood and accepted, “dissatisfaction must be sustained over a period of time for accommodation to occur” (p. 297). Here, the authors stressed the need for pre-service teachers to continue their exploration and evaluation of the two concepts so they have a better understanding about the alternative concept. They listed the three remaining
conditions from the original conceptual change theory, which are to be intelligible, plausible, and fruitful. They advocated activities that would provide pre-service teachers with relevant information and opportunities to test the alternative concept. Examples of good strategies for the post-dissatisfaction stage include effective modeling, idea exchanges, and journal keeping.

This sub-section looked at how the theory of conceptual change can be used to help pre-service teachers accept different instructional approaches to technology instruction. In the next sub-section, this paper proposed a framework that integrated the theory of conceptual change to help pre-service teachers accept VS as an alternative mode of schooling.

Conceptual change, VS and pre-service teacher education – A proposed framework

Thus far, this literature review has identified the importance of personal history and how it influences pre-service teachers’ professional studies (Knowles & Holt-Reynolds, 1991). It also reviewed the four conditions of conceptual change theory in science education (Posner, et al., 1982, Strike & Posner, 1992) and the modified three-stage conceptual change theory for pre-service teacher technology education (Sadera & Hargrave, 2005). Based on these reviews, this study proposes a framework to help pre-service teachers deal with VS as a new and alternate form of education. This framework is created with the intention of helping teacher educators design instruction that will help pre-service teachers with their conceptual change about VS.

The framework identified in Figure 3.1 is divided into three stages horizontally. These three stages, pre-dissatisfaction, dissatisfaction, and post-dissatisfaction, are similar to those proposed by Sadera & Hargrave (2005). Under the pre-dissatisfaction stage, the framework incorporates the findings of Knowles and Holt-Reynolds (1991) that emphasized the recognition of pre-service teachers’ personal histories as students. Starting at this point, the framework then branches to experiences that include or do not include VS experiences. Those that have past experiences with VS may have either good or bad experiences depending on different factors such as how the VS course was designed, the context in which the course was offered, the effectiveness of the VS instructor, etc. Whether pre-service teachers have or do not have VS experiences, or whether their VS experiences were good or
bad, their personal experiences help them to formulate beliefs, misconceptions, and
preconceptions about VS resulting in certain concerns. In this framework, preconceptions are
defined as any ideas formulated prior to formal instructions, and these can be accurate or
inaccurate. Misconceptions, on the other hand, are regarded as inaccurate preconceptions.
Meanwhile, beliefs involve some judgment or conviction that an idea possessed by the
individual is true. Finally, concerns are issues that occupy the individual’s thoughts as
expressed through their reflections.

Once these beliefs, preconceptions, misconceptions, and concerns are identified,
relevant resources and activities need to be provided so pre-service teachers’ dissatisfaction
(Posner, et al., 1982; Sadera & Hargrave, 2005; Strike & Posner, 1992) with their existing
ideas about VS can be triggered. These activities can include relevant readings, exploration
of exemplary VS demos or live VS courses, talks with VS instructors and relevant VS
participants, VS field experiences, etc. At this point, if pre-service teachers’ dissatisfaction is
still not triggered, they will not experience any conceptual change because they see no need
to change their existing perceptions of VS. The curriculum designer or teacher educator
should go back to the first stage and reassess the pre-service teachers’ beliefs,
preconceptions, misconceptions and concerns about VS to understand the reasons for the
resistance. However, if they begin to see that there are potential discrepancies between their
perceptions and the new concept, they will then proceed to the third stage, post-
dissatisfaction.

In the post-dissatisfaction stage, activities must be designed to help pre-service
teachers to reflect, process, and actively engage in their thought process about their beliefs
and their reactions to the new concept. Once pre-service teachers have been given the
opportunity to evaluate the new concept and find it to be intelligible, plausible, and fruitful
(Posner, et al., 1982; Sadera & Hargrave, 2005; Strike & Posner, 1992), then there will be a
conceptual change about VS. However, if they find it not to be intelligible, plausible, and
fruitful, then there will not be any conceptual change. If this happens, then the curriculum
designer or teacher educator should proceed back to the first stage and re-assess the pre-
service teachers’ beliefs, preconceptions, misconceptions, and concerns followed by new
resources and activities that will help to further facilitate the conceptual change process.
The last element of this framework is based on Strike and Posner’s (1992) revised theory of conceptual change in which they acknowledged the role of motives, goals, and the institutional and social sources of them. They stated that these factors interact with other components in the framework. This framework also acknowledges these factors and has placed them separately in the framework. These factors cover all three stages and have no arrows connecting them to any other components in order to represent the interaction of these factors with the learners’ overall conceptual ecology as proposed by Strike and Posner.

Overall, this framework suggests that pre-service teachers’ prior experiences as students can influence the beliefs, misconceptions, and preconceptions they have about VS. These thoughts can lead to a range of concerns. To help pre-service teachers accept VS as an alternative mode of schooling, relevant and useful curriculum materials must be presented to show that this new idea is intelligible, plausible, and fruitful. This study took place as part of a federally funded project to develop model curriculum to help U.S. teacher education to prepare pre-service teachers for VS as an alternative mode of schooling. This study examined
pre-service teachers’ reflective journals to determine some of the common misconceptions, preconceptions, and concerns they had regarding VS.

**Methods**

This qualitative study was based on a grounded-theory approach (Strauss & Corbin, 1990, 1998). Instead of beginning with a theory, this study started by examining rich empirical data from participants for “interconnected thoughts or patterns linked to a whole” and then used these relationships to develop a “pattern theory” that was grounded in participants’ information (Creswell, 2003; Esterberg, 2002; Lincoln & Guba, 1985; Merriam & Associates, 2002). The purpose of this grounded study is to identify common preconceptions, misconceptions, and concerns about VS held by pre-service teachers. This study includes an in-depth analysis of pre-service teachers’ reflective journals and discussion posts from a pre-student teaching seminar and the course instructor’s semi-structured interview. The researcher’s journal was also used to provide additional insights.

**Setting/Context**

This study was conducted within a teacher education program at a large state university in the Midwest. This teacher education program includes 16 undergraduate licensing areas, 28 added endorsement programs, and 11 graduate licensing areas. The university also has the Center for Technology in Learning and Teaching (CTLT) that aims to provide leadership in the use of educational technology in teacher education through research, development, and service.

**Participants**

The participants of this study were selected based on their participation in the first of three virtual seminars on VS integrated in a pre-student teaching experience course at a large Midwestern university. Three sets of student participants were gathered from fall 2006, spring 2007, and spring 2008. Students from fall 2007 were not included in this study because a technical glitch in the course management system (CMS) failed to release the tasks for this virtual seminar. The participants were informed of the TEGIVS project and research intentions as required and approved by the university’s Institutional Review Board (IRB) at the beginning of the course, and they gave their permission to have all their reflections and
responses in the course to be used as secondary data. Because this was a secondary education
course, only five of the participants were from elementary education. These five participants
had to enroll in this course concurrently with a technology course as a requirement for a
minor in technology. Table 3.1 shows the numbers of participants according to the semester
they participated as well as their declared major based on the enrollment data provided by the
course instructor. No additional survey was given to obtain information such as past VS
experiences or perceived expertise with educational computing. To protect the anonymity of
the student, pseudonyms were used.

Table 3.1 Number of Participants According to Declared Major and Semester

<table>
<thead>
<tr>
<th>Major</th>
<th>F06</th>
<th>S07</th>
<th>S08</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum and Instruction</td>
<td>1</td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Computer Science</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Electrical and Computer Engineering</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Elementary Education</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>English</td>
<td>13</td>
<td>9</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>World, languages, and culture</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Health and Human Performance</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>History</td>
<td></td>
<td>11</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>Mathematics</td>
<td>2</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Political Science</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Grand Total</td>
<td>22</td>
<td>17</td>
<td>26</td>
<td>65</td>
</tr>
</tbody>
</table>

In addition to the student participants, the course instructor was also included as a
participant using the method of purposeful sampling. He was included in this study because
of his role as the course instructor as well as his five years of experience with pre-field
experience seminars and his critical input during the brainstorming stage of the curriculum
development. Jason Follett (real name used with permission) has ten years of experience with
the education system in the state of Iowa both in public and parochial schools. He has been a
certified teacher since the early 1990s and holds a graduate degree in Curriculum and
Instruction. He also has more than nine years of experience in teacher preparation and holds
several teaching positions for various institutions of higher education as well as non-profit
educational groups. Because of his interest in educational technology, he was recommended
by the university field placement director to participate in the TEGIVS project. As an active
collaborator, Jason had provided critical information for the project field experience team
and volunteered to try out the TEGIVS material in his curriculum.
Lastly, I played various roles including the researcher, curriculum developer, and course teaching assistant. I conducted my preliminary observations concurrently with my responsibilities as the course teaching assistant. These early observations helped to inform minor revisions in the curriculum. In a later section of this paper, I provide additional information about myself as a researcher and the multiple roles I played in this study.

**The Researcher and the Research Context**

In qualitative research, Jones (2002) stated that researchers must “make known who they are in the context of the study under investigation and make explicit the ‘subjective I’” and that the researchers have to be cognizant of their own assumptions and be explicit about the influences that these assumptions have on the research since they are the “instrument” in the research design (p. 463). In line with this recommendation, I will describe the different roles and responsibilities I play within this study and the influences they may have on my analyses and interpretations. In order to minimize my subjectivity, I have identified circumstances and the many intertwined roles that may have influenced my thoughts, and hopefully in so doing, understand why and how I have come to my interpretations. Reflexivity is crucial for this case study because the experiences that I have identified below have led me to many preconceived notions about the research context and expectations for the findings (Esterberg, 2002).

From 2004 to 2008, I worked as a graduate research assistant funded by the TEGIVS project. By the time I conducted this study, I had been working on the project for more than three years. My experience with the project resulted in knowledge as well as personal ideas of VS. Moreover, my continual professional development as a TEGIVS collaborator and my interactions with others in the field through professional conferences also contributed to reinforcing some of my perceptions of VS. Additionally, my personal experiences with graduate courses online also contributed to my perceptions of VS. Some of those perceptions include my acceptance of VS as an effective format of education as long as sound learning theories are incorporated and technology is used as the vehicle rather than the content. In other words, I see VS as a good format of education if technology is used effectively to enable the learning activities to occur.
I also played the role of a curriculum developer and teaching assistant in this study. My 12 years of training and experiences as a teacher in Malaysia, England, and United States gave me skills in curriculum design and knowledge of teaching strategies. Additionally, I was familiar with educational technology as I had integrated online chat tools to improve the willingness of international teaching assistants to communicate in English in my master thesis (see Compton, 2004a, 2004b) as well as develop and pilot a virtual field experience for pre-service teachers for TEGIVS (see Compton, N.E. Davis, & Mackley, in press). As a graduate student, I have also been involved with faculty technology mentoring where I helped a faculty member learn and design a course in WebCT. Since the course instructor in this study was new to WebCT, I was able to design the VS seminars and provide mentoring and technology support as his teaching assistant.

As a researcher, my involvement with research on VS has been greatly shaped by my research experiences as a doctoral student in Curriculum and Instruction and master student in Teaching English as a Second Language. I have conducted and published research in the areas of computer assisted-language learning (Chapelle, Compton, Kon, & Sauro, 2004; Compton, 2004a, 2004b, 2009) and virtual field experiences for pre-service teachers (Compton, N.E. Davis, & Mackley, in press; N.E. Davis, Roblyer, Charania, Ferdig, Harms, Compton, & Cho, 2007). My research experiences gave me sufficient tools and understanding of quantitative and qualitative research to design, implement, and conduct this present study. Because of that, I was given the opportunity to develop and lead this part of the TEGIVS project for my doctoral dissertation.

**VS Curriculum Intervention**

In spring 2006, a course instructor teaching a pre-service teaching experience course at a large Midwestern university was invited to participate in one of the TEGIVS curriculum intervention. This pre-student teaching experience course addressed educational topics ranging from classroom discipline to reflective teaching practices. Pre-service teachers participated in eight or nine weekly seminars prior to their school placement for observation of in-service teachers. During spring 2006, one pilot seminar on VS was integrated into this existing pre-student teaching experience. The pilot seminar included three learning tasks:
exploration of a VS demo, review of a VS case study, and a written reflection about VS. (See Appendix 1 for curriculum materials developed for the pilot seminar.) Based on the feedback from participants of this pilot seminar, additional readings and discussion activities were included and the number of seminars increased from one to three. The additional readings covered the challenges of VS and the efficacy and influence of VS on student learning and legislative issues pertaining to VS. (See Appendix 1 for the link to curriculum materials used for all three seminars.) The purpose of these seminars was to increase the pre-service teachers’ awareness of VS and provide them with a general introduction to VS. These listed curriculum materials were reproduced in Microsoft Word for the purpose of sharing resources on the TEGIVS website. The participants however received the list of readings and tasks in a password protected learning management system, i.e. WebCT. Three preparatory seminars on VS (Parts 1, 2, and 3) were integrated in subsequent course offerings between fall 2006 and spring 2008. To limit the scope and focus of this study, only responses to Part 1 were used to allow an in-depth study of the data. Part 1 had four tasks (See Appendix 2). The first task required participants to read and respond to a document by NACOL listing the top ten myths about virtual schools. The second task in this seminar led the participants to explore an exemplary VS course that showcased an effective course management, a good blend of asynchronous and synchronous activities, a mix of individual and group tasks, a curriculum that utilized relevant resources found online and in the students’ homes, course rigor, teacher feedback, classroom interactions, and various strategies for learning evaluation and assessment. The participants also had to watch the recorded interview with the course instructor, identify the positives and negatives of the course, and relate it to their future teaching careers. In Task 3, participants read a case study of a VS course and considered its effectiveness and replicability. Finally, in Task 4, participants summarized their thoughts as a personal journal after completing the first three tasks. In spring 2007 and spring 2008, an additional task was set for participants to write their initial thoughts of VS as a personal journal before starting on the four tasks. Participants from fall 2006 did not receive this instruction to provide their initial thoughts.
Data Collection

I used multiple data collection procedures for this study. The primary research tool was WebCT Vista, the learning management system used to manage all the curriculum materials in the learning modules and participants’ responses. The pre-service teachers who participated in this study in fall 2006, spring 2007, and spring 2008 were required to reflect and respond to the curriculum materials on VS. These participants responded by writing and posting journal responses and a summative report within WebCT Vista. All journals were electronically archived automatically. Because I was helping the course instructor to create and manage the learning management system, I was able to retrieve the electronic journals with the instructor’s permission after the course had ended. These reflections were considered to be electronic texts and treated as documents (Creswell, 2003; Esterberg, 2002). Because they were part of an online curriculum, these electronic texts provided rich qualitative data that represented the participants’ thoughtful reactions after giving attention to the assigned tasks in the first of three seminars. While WebCT allowed me to access this data and retrieve it at my convenience for secondary data analysis, it did not allow me to pick up on any non-verbal cues or to probe the participants for further clarification.

Once all journals were retrieved, I proceeded to sort them. The first step was to exclude participants who only completed one or two tasks and isolate their journals from the data. Table 3.1 in the previous section showed the final count of participants that were included in this study. The second step was to calculate the percentages of responses according to the tasks and semesters. Table 3.2 shows the percentages:

<table>
<thead>
<tr>
<th>Data</th>
<th>Fall06</th>
<th>Spring07</th>
<th>Spring08</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Students</td>
<td>22</td>
<td>17</td>
<td>26</td>
<td>65</td>
</tr>
<tr>
<td>Average of Initial*</td>
<td>n/a</td>
<td>100%</td>
<td>88%</td>
<td>93%</td>
</tr>
<tr>
<td>Average of Q1</td>
<td>100%</td>
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<td>92%</td>
<td>82%</td>
</tr>
<tr>
<td>Average of Q2</td>
<td>100%</td>
<td>88%</td>
<td>92%</td>
<td>94%</td>
</tr>
<tr>
<td>Average of Q3</td>
<td>95%</td>
<td>41%</td>
<td>81%</td>
<td>75%</td>
</tr>
<tr>
<td>Average of Q4</td>
<td>95%</td>
<td>88%</td>
<td>81%</td>
<td>88%</td>
</tr>
<tr>
<td>Average of Summary**</td>
<td>27%</td>
<td>82%</td>
<td>77%</td>
<td>62%</td>
</tr>
</tbody>
</table>

n/a not applicable
*Seminar 1 consists of the Initial thoughts*, Questions 1-4.
**Summary is the concluding report by students after Seminars 1-3
In addition to the reflective postings from the student participants, a semi-structured interview was also conducted during summer 2008 with the course instructor in his office. Open-ended questions were used to probe his thoughts about the need to expose pre-service teachers to VS and the pre-service teachers’ level of awareness about VS over the last few semesters. (See Appendix 3 for list of questions.) The interview lasted approximately an hour and was recorded using a digital audio recorder. The interview was transcribed the following week and follow-up questions were conducted via e-mail throughout the analysis process as they arose.

I also maintained my researcher’s journal that included ruminations of my “experiences, ideas, fears, mistakes, confusions, breakthroughs, and problems” (Spradley, 1980, p. 71) based on the multiple roles I played including researcher, curriculum developer, and teaching assistant.

**Data Analysis**

Coffrey and Atkinson (1996) stated that the goal of qualitative analysis is to focus on the potential meanings. They recommend three basic steps: “(a) noticing relevant phenomena, (b) collecting examples of those phenomena, and (c) analyzing those phenomena in order to find commonalities, differences, patterns, and structures” (p. 29). For this study, I used emerging themes from a conference presentation as a starting point because those themes indicated that there was a set of common ideas about VS held by pre-service teachers. I proceeded to expand my data set so I could thoroughly examine the common patterns in the pre-service teachers’ responses regarding VS.

*Pre-study*

Prior to the analysis of data for this study, I had conducted preliminary analysis for a conference proceeding at an international teacher education conference. The data for that proceeding paper was only limited to spring 2006. The analysis for the conference gave me an opportunity to get an overview of what the participants were thinking and concerned about. Also, because this pre-study was also part of the bigger project, i.e. TEGIVS, I shared the developments and progress of this early pre-study during weekly project meetings with the principal investigator who was also the director of the Center of Technology for Learning.
and Teaching at the university and three graduate research assistants who were doctoral and master students in the Department of Curriculum and Instruction. The process of reporting about the pre-study helped me in the initial stages of thinking through the development and implementation as well as the data collection process. It also led me to revise parts of the curriculum design to facilitate the data collection process. One example was to instruct pre-service teachers to post their thoughts as reflections under the threaded discussion board in WebCT instead of submitting them as assignments or assessments. Another example was to include the additional task of eliciting pre-service teachers’ initial thoughts on VS. The support of the project team who were all immersed in issues relating to VS allowed me to raise questions and concerns, and their probing for details allowed me to report my initial reactions after skimming through the participants’ data. This process of sharing helped me to clarify part of my emerging understanding of this pre-study. Furthermore, the conference presentation of this pre-study also helped me to organize my thoughts and get useful feedback from others in the field.

Present study

This study uses a grounded approach to the analysis process. Strauss and Corbin (1990, 1998) recommended a two-stage process of coding, i.e. open coding followed by focused coding. Esterberg (2002) explained that the open coding stage should include intensive line by line analysis of themes and categories of interest and not to use any pre-established codes, even my own. Thus, I did not refer to my pre-study for any pre-existing codes, which allowed me to remain open-minded. I highlighted phrases of interest and wrote one or two word codes like “cheating”, “interaction”, “teacher” and “feedback” in the margin. After completing this stage of analysis, I began to see some common themes and expanded my coding system to be more specific. For example, the code “teacher” was further divided into “teacher-feedback” and “teacher-job”.

Once the open-coding process was completed, I began to identify several key recurring themes. I proceeded with a focused coding process where I looked through line by line focusing only on the key themes that emerged (Esterberg, 2002). Some of the themes that emerged included career, academic issues, pedagogical issues, and equity. At this point, I also referred to emerging themes from my previous conference proceeding (Compton, Follett...
Demiraslan, 2007) in which I had conducted preliminary analysis of data from spring 2006.

I repeated the open and focused coding with the interview data and linked the codes with the emerging themes from the pre-service teachers’ data. I also wrote analytic memos in my researcher journal throughout the analysis process to remind myself of my “hunches ideas and best guesses” and how I made “connections between cases” (Esterberg, 2002, p. 166). Some of these analytic memos helped to raise more questions, which led me to repeat the focused coding process. For example, I started to notice a similarity in responses among the pre-service teachers from the Department of English and among the pre-service teachers from Department of World, Language and Culture (WLC). Consequently, I returned to my data to track the participants according to these two declared major to see if there were commonalities and differences.

**Trustworthiness**

In qualitative study, Creswell (2003) stated that trustworthiness is used to determine “whether the findings are accurate from the standpoint of the researcher, the participant, or the readers of an account” (p. 196). Lincoln and Guba (1985) listed three criteria for trustworthiness, which are credibility, transferability, and confirmability. To promote the trustworthiness of this study, several strategies have been utilized. The primary strategy utilized is the provision of rich, thick, detailed descriptions of the research methods, analysis process, and the participants’ experiences to provide “sufficient information about the context in which an inquiry is carried out so that anyone else interested in transferability has a base of information appropriate to the judgment” (Lincoln & Guba, 1985, p. 124). To facilitate the credibility of my findings, I triangulated different sources of data including the students’ journal reflections from three different semesters, the course instructor’s interview data as well as my researcher’s journal to build a coherent justification for the themes. Furthermore, I conducted member checking by sharing my findings with the course instructor and systematically soliciting his feedback and confirmation to determine if my interpretations and conclusions were valid. Finally, to promote confirmability, I clarified my researcher’s bias under the earlier heading of “The Researcher and the Research Context.”
also relied on my researcher’s journal, which included my assumptions, biases, and insights throughout the study.

Findings

This section looks at the common preconceptions, misconceptions, and concerns under the following three themes: future career, academic issues, and pedagogical issues. Several participants expressed concerns that VS posed a threat to their future careers and contemplated about the viability of VS in their content area. In addition, many participants raised concerns about academic issues such as academic dishonesty and equity. In terms of pedagogy, participants’ thoughts focused on interactions, teacher feedback and lack of rigor. Besides these three themes, a further analysis of the experiences and reflections of three purposefully selected participants and the course instructor provided a closer look at how prior experiences and curriculum materials influenced the conceptual change as well as the perceived trend in the pre-service teachers’ response to VS.

Future Career

Career threat. Participants in this study were pre-service teachers who had entered the teacher education program in hopes of becoming teachers after graduation. Many participants expressed fears in their initial journals that VS would lead to the cut in teacher employment. It was not surprising that the loss of job prospects would be a common concern because these participants were only in the early stages of their teacher education program. They viewed VS as a threat to their future careers because they believed that VS involved very little need for teachers in course offerings. Instead, their responses indicated a common misconception that VS was similar to correspondence courses. However, instead of a teacher sending out course materials and grading submitted work, they saw the substitution of the technology to offer the curriculum and conduct automatic grading of quizzes and tests, resulting in the elimination of a teacher position. The following comments illustrate this concern and misconception:

I am concerned for my job. This is not my chosen vocation for a whim. I want this job, and I find this to be a potential threat. (Initial thoughts) …What will VS do (to) the population of working teachers? Theoretically, it has the power to replace vast numbers of them, thereby reducing overhead through budget cuts. (Bart, S07, Myth)
My biggest concern about VS is that someday I may be out of a job because computers have taken over education. (Sho, S07, Initial thoughts)

This misconception was cleared by the end of their first seminar. Many participants indicated in their summary journal that they were willing to consider teaching a VS course or to consider blended learning in their future careers. Although there were no direct responses that stated that their misconception of VS as a threat to their future careers had been cleared, their willingness to incorporate elements of VS into their future career or to consider a career related to VS showed that they no longer viewed VS as “teacher-less”. As seen in the statement below, the participants signaled that they had a role in the VS course (italics mine):

It would be a challenge to teach an English course in VS. I think it could be done, but the students would have to participate in discussions/chats a lot and I would have to be present to answer questions on things like grammar if they were discussing writing or to answer questions about literature… I think VS is only effective when it is done right and that requires the teacher to be organized and clarify everything that is being done. (Sod, S08, Summary)

…though I’m not very knowledgable [sic] on the subject of VS, I think it would be to my benefit to take additional courses to enhance my understanding of VS and hope to use it in conjunction with my classroom. (Jon, S08, Summary)

Overall, the curriculum materials provided participants with information to help them understand that VS was unlike correspondence courses because the VS teacher still played an important role. This realization helped to ease their concerns about the potential loss of jobs and made them more willing to consider VS options such as blended learning.

Viability of VS. Participants also tended to view the viability of VS differently according to their declared major especially those with English education and foreign language (Spanish and French) majors. Almost all participants from the English education program indicated that it would be difficult to implement VS English courses even though they saw the possibility for VS in other subject areas. Many viewed face-to-face discussions and group work in traditional classroom settings as important components of any English class but did not accept online threaded discussions or online group work to be as effective, even though they thought the exemplary VS course (Task 2) illustrated excellent uses of online discussions and group work. The comments below illustrated these sentiments:

I feel like a VS class in English would be fairly limited. …I feel that literature is best discussed where conversation can happen face-to-face and would feel very reluctant teaching it in a VS format. (Leks, F06, Summary)
My content area is English, and I could see this kind of class to be a bit more difficult to teach in a virtual schooling setting simply because so much of English education involves reading, writing, and class discussion. These are often the kinds of activities that benefit a student more to experience one-on-one or in a physical class environment. (Sar, F06, Summary)

If I were to teach a VS class in English, I would feel that deep constant discussion, as well as being able to hear how certain texts are read would be an issue. (Eng, S08, Summary)

On the contrary, participants from the foreign language programs, specifically those specializing in Spanish, were more open to the potential of Spanish in VS. Although they saw challenges in implementation, they considered adapting ideas from the exemplary VS course and the culinary case study to provide effective learning tasks in a VS Spanish course as seen below:

For teaching a VS course in Spanish there are several resources, such as videos, podcasts, discussions, short writings, essays. … I think it is possible to design a Spanish VS course, yet it requires the use of different technologies and strategies for this kind of course. The students must demonstrate proficiency in the language in relation to communication, culture, connection, comparisons, and communities. These elements must be included in any language course either VS or regular classroom. (Gonz, S08, Summary)

If I needed to teach a Spanish class as a VS course, I would have the issue of not being able to have choral repetition and to practice as a class. I would hope to have a 2-way interactive ICN$^{3.1}$ so the class could be given synchronous instruction. (Hans, S07, Summary)

For Spanish, I think one of the biggest issues would be teaching the correct pronunciation of words and seeing if the students were also pronouncing words correctly. I think the remedy for this would be to stream examples of speaking in Spanish to students so that they could listen to the examples whenever they wanted, and also have the students record themselves speaking so that I could provide them feedback….Another issue that I see with Spanish is that students may lack the ability to interact and use their new language skills with other students. I think for that we would have to orchestrate some type of live chat where students would have to talk to each other in Spanish. (Ken, S07, Summary)

The differences between the two groups of participants were likely to be influenced by the culture of their respective departments, i.e. the departments of English and WLC. Both groups expressed the importance of aural-oral activities such as read-aloud and choral repetition in English or pronunciation exercises in Spanish but more participants from the

$^{3.1}$ Iowa Communication Network (ICN) has over 700 two-way interactive audio-video classrooms in education facilities, government agencies, hospitals, armories, and public libraries throughout the state of Iowa. (see http://www.icn.state.ia.us/)
WLC department were open to the use of technology and the modification of the tasks for a VS course. As a graduate student who has experienced the culture of the English department and worked with faculty in the WLC department in this university, I believe that the culture of the departments played an influential role in shaping the reactions of the participants. As indicated in my researcher journal below, the role of technology as viewed by faculty likely impacted the participants’ preconceptions about VS in their content areas:

The English department here houses the programs for English education and linguistics. In the linguistics program, there’s strong technology culture because there is a CALL (computer-assisted language learning) emphasis. But the English faculty who deal with the English education program are more conservative when it comes to teacher training. Most of their faculty conduct traditional in-class methodologies for teaching English and do not integrate much technology into their lessons, at least not in the early part of their program. Thus, pre-service teachers do not have access to modeling for the use of technology for English education classes. I also think that many of the faculty members working with the English education pre-service teachers are from the older generation so they are less likely to be interested in working with technology. I know this is similar to the perceptions of the director of field experience based on my past interview (for a different study). On the other hand, the WLC department has a strong technology focus. They have a technology center with full time staff that supports research and teaching using technology. Their research grants have helped them to acquire different technologies that support their instruction such as videos, podcasts, digital recorders, etc. Their faculty members are also actively engaged in technology-assisted language learning and often model it through their class instructions. That is probably why their pre-service teachers are more willing to consider modifying in-class activities and using technology to support the delivery of a VS Spanish course. (Researcher journal)

The course instructor expressed similar thoughts about the influences of faculty on pre-service teachers’ view of educational technology. He thought that younger faculty tended to include technology in their classroom while older faculty “who live and breathe their specialty don’t necessarily live and breathe the technology aspects of it” (Jason, Interview). Although he noted that the faculty members in charge of the English pre-service teachers and WLC pre-service teachers were similar in age, he perceived the WLC faculty member and her colleagues to be more open towards technology and was likely to “promote it in a positive light in [their] methods class” (Jason, Follow-up interview). He believed that pre-service teachers need to see effective modeling of online technology in order to see the potential of VS in their content area. To do so, he recommended integration of online technology in existing courses because that would provide examples of how VS could be
done. He added that the Department of Curriculum and Instruction faculty that teach the methods courses in elementary education, secondary education, mathematics and science education have little control over the methods classes in English education because the Department of English is within a different college at the university. Therefore, it would be difficult to provide knowledge about the potential VS for pre-service teachers in English education beyond this required pre-field experience course unless the faculty of the English education program chose to integrate it into their courses.

**Academic issues**

*Academic dishonesty.* Academic dishonesty appeared to be a common academic concern. Several participants reported that they or people they knew had cheated in online courses. Three popular ways of cheating reported were as below:

1. getting someone else to do the assignment
2. collaborating with someone else on an assignment
3. downloading and saving the quiz in the first attempt, complete the quiz with the help of resources either books or other people, then entering answers on the second attempt.

Additionally, several participants believed that cheating was more difficult to detect and there were more opportunities to cheat in VS compared to a traditional classroom setting. Responses also showed that many participants did not favor collaborative learning. For example, in these responses to the exemplary VS course (Task 2), the participants viewed changing answers as a form of cheating rather than a learning process. These participants’ preconceptions of assessment were based on their prior experiences as students in contexts in which testing was an individual effort and grades were assigned based on knowledge displayed in paper and pen tests.

…students working collaboratively together. They are able to share their results, and access their works. This may also be a negative. What does sharing results entail? Are students then able to change answers and cheat? (Eng, S08, Demo)

…if you assign a quiz/test, it is easy for the students to collaborate and get a perfect score on the test. (Mill, S08, Myth)

After reading the NACOL article, participants displayed varied responses about this issue. Some participants were convinced by reading the NACOL article that “Cheating is no
more prevalent online than in the classroom” (p. 2) while others thought of ways to prevent cheating:

Some virtual classrooms require tests to be taken in a testing center or traditional classroom situation that is no different than a bricks-and-mortar class. Some instructors simply remove much of the cheating factor by making VS assessments open-book and open-note. (Long, S08, Myth)
I would require students have proctored tests so I can tell whether or not they are actually understanding the material or just copying answers and examples from a book. (Per, S08, Myth)
I think the best way to keep students from cheating is to monitor what work they turn in and check it. (Ferg, S08, Summary)

In response to the exemplary VS course (Task 2), some participants took note of the two different functions of quizzes in the VS Demo, i.e. teaching and assessing quizzes. The use of quizzes for different purposes drew mixed responses. While some saw these quizzes as useful to “prevent cheating” as well as “keeping students from falling behind” or “to find out what areas they may need assistance on,” others felt the high number of quizzes took “too much time and energy” and could be discouraging because “students need to be assessed in a constant and on-going manner.”

After the completion of the first two tasks, some participants maintained skepticism about cheating prevention because they believed that students were more likely and more able to cheat in a VS environment. Others, however, began to realize that there were ways of reducing cheating opportunities, such as proctored tests and open-book assessments. Some participants like Mil (S07, Demo) also expressed interest in learning more about VS and cheating prevention once they realized that “students can be kept accountable in VS.”

Equity. Equity in terms of the target VS population was another common academic issue. Many participants who had not been exposed to VS had preconceptions of VS as a small population that was restricted to college students, talented and gifted (TAG) high school students or advanced placement (AP) students as indicated in responses similar to the following:

I was not, however aware of how many students participated in virtual schooling. … I would have thought that online courses would work best for talented and gifted students. (Bee, F06, Myths)
Additionally, the course instructor mentioned that the pre-service teachers were acutely aware of the equity issue from personal experiences and realized that “schools, states, students, etc. are not made from the same casts and thus some have more than others and not everyone is equal. Students also know other equality factors are at play in education” (Jason, Interview). However, this perception gradually changed for some after completing their assigned tasks. These participants began to realize that students who were in rural areas and who did not learn well in traditional settings could benefit from VS as seen in the responses below:

I realized that not only would lower-level students also benefit from this option, but they would also be granted precious access to computers… (Bee, F06, Myths) …many classes are offered exclusively online because without them being offered this way, students wouldn’t get access to them at all. I imagine this is especially true in rural areas where access to a brick and mortar campus is difficult or where finding qualified local teachers is difficult. (Sar, F06, Myths)

Few participants expressed concerns about equity in terms of technology access and cost. These participants initially believed that many students would miss out on the opportunities offered by VS because computers are “not readily available for everyone” and many students do not have an internet connection. Some others were concerned that rural schools may be at a disadvantage due to the lack of funding:

One negative I see is adequate funding for rural schools… (Solb, S08, Demo) What about poorer districts and low-income families? Will VS be another extension of the digital divide? (De, S07, Initial thoughts)

The course instructor also noticed these concerns as he noted that the pre-service teachers talked about “some schools and communities that did not have the technological capabilities” to provide effective VS experiences for their students.

Because none of the curriculum materials on VS explored the issue of cost or technology access in detail, the participants completed their tasks with their concerns still unanswered. Although their summative responses indicated that they were more open to the use of technology to support VS, they still believed that the cost would be a major deterrent: “If a district cannot afford an ICN, they lose the benefit of interacting with students of different learning environments, backgrounds, etc, and the idea of Distance Education is lost to them.” (Kad, S07, Summary). However, others like Mill (S07, Summary) and Metz (S07,
Summary) believed that the issue of cost should not deter them from the benefits of VS and that funding issues can be overcome through grants.

**Pedagogical issues**

*Interaction.* The level of interaction in VS was a common pedagogical concern for the participants. Most participants who relied on their past experience with VS stated that online courses did not provide many opportunities for interaction. These participants said that their online experiences were limited to individual tasks in which they retrieved materials and completed assignments and assessments individually. They were often not required to actively participate in asynchronous (threaded) or synchronous discussions or collaborate with other students.

Other participants who did not have any prior online experiences relied on their personal experiences as students within a traditional classroom to formulate their preconceptions of interaction in a VS setting. Most of these participants commented in their initial posts that VS would lead to the loss of “socialization,” “human connection” and “personal contact” as reflected in the example below:

> My biggest concerns about virtual schooling are that it makes genuine and spontaneous interaction impossible and that it eliminates the public and social aspects of learning. …It seems to me students need more contact time with peers and teachers where they must develop social and political skills, not more time interacting with a machine. (Cop, S07, Initial thought)

Such comments again indicated that some of the participants viewed VS as automated learning environments that were driven by technology rather than using technology as a supportive agent in a learning environment.

There also appeared to be a disparity in the way participants viewed interaction. Responses showed that some participants only accepted face-to-face interaction in traditional classrooms as interaction. Online interaction through asynchronous discussion boards was viewed as forced or not “spontaneous” and therefore, not “genuine” interaction, whereas face-to-face online interaction supported by video technology was not accepted as interaction because there was a spatial distance, which affected the validity of the “face-to-face” concept. For example, in response to the exemplary VS course, Ren (S07, Demo) noted that “The lack of physical human interaction makes me worry about the future.”
Additionally, participants who commented on the level of interaction after completing the same task of exploring the exemplary VS course came up with opposite observations. Some saw limited interaction while others saw high levels of interaction among students and between teacher and students. For example, these participants noticed very little interaction:

…I noticed …that it does seem to lack interaction. Also it seemed very formal. There was no personality or touch to it to make it seem that inviting to me. (Upch, F06, Demo)

Some setbacks of VS is that the teacher doesn’t exactly get the opportunity to know the student on a one to one basis. (Phil, F06, Demo)

Something that I didn’t like about the VS course was that there is limited interaction with peers in the course. (Egg, F06, Demo)…The one thing that holds me back from taking more VS course is the lack of peer involvement. You don’t really get a chance to work face-to-face with other peers. (Egg, F06, Summary)

On the other hand, these participants below saw many opportunities for interaction:

Even though the course is online, the teacher is still very active in interacting with the class. She gives them opportunities to interact with her in real time. She also gives them groups to work in as support if she’s not available. The assignments go far beyond just quizzes and tests, and involve actual lab work within their groups…There is also a great tool for discussion on the webpage. This way, students can communicate between each other and the teacher. (Will, F06, Demo)

Another positive of this VS class is that Gail provided many opportunities for students to get to know each other and work together, just as a teacher would in a traditional classroom. (Mill, S07, Demo)

I like the idea that they used both WebCT and ICN, because there is still a personal interaction and the VS didn’t completely replace the need for a teacher. …it also still involves student-student interaction with the chat feature. (Hay, S07, Demo)

After reading the NACOL (n.d.) article, some participants also expressed skepticism towards the idea of teachers knowing their online students better than in face-to-face classrooms because of their personal VS experiences as seen in the comments below:

I have been involved in 2 online courses in college and I felt no connection to my teacher… (Mos, F06, Myths)
I also though(t) that virtual classes did lack interaction because I have taken many classes online where I never even knew what the professor looked like. (Bee, F06, Myths)

This skepticism was addressed in their exploration of the exemplary VS course in Task 2 as they saw how students were required to actively engage in the VS course through carefully structured tasks and learning activities. A participant (Sar, F06, Demo) commented that “the
demo course proves that VS courses can be completely interactive and engaging as long as the teacher is willing to put the time into designing the course that way”. Others also realized that the level of interaction in a VS course can be high depending on the opportunities provided and reacted positively to the high “amount of student involvement,” “student to student contact,” and “the different types of interactions” as seen in the exemplary VS course. For example, Bee (F06, Demo) noted that she liked the level of engagement required by students through collaborative projects, discussion boards and responsibility as a constructive learner.

Another issue regarding interaction was the loss of student-teacher interactions. This preconception was either based on their assumption that VS was like a digital version of a correspondence course run by automated systems with minimal teacher responsibilities or that VS was conducted only asynchronously leading to the unavailability of the teacher to provide immediate feedback through the digital space that detached the teacher from the students. Several participants expressed concerns that students would lose access to a teacher and the personal feedback necessary for learning as seen in the comments below:

I think students need a teacher who is present in the classroom and can explain things and answer questions immediately. (Hamp, S08, Initial thoughts)
Some students feel the need to have the teacher in the classroom to explain anything they are not understanding and are able to answer questions. (Perr, S08, Initial thoughts)
I would rather teach it in a classroom setting because I would want to be able to SEE if my students were understanding what they were learning. (Egg, F06, Demo)

The curriculum materials included information and evidence of interaction in VS. However, participants had different views about what was accepted as interaction, which led to varied reactions about the level of interaction in VS. Furthermore, the lack of specific guidelines for the exploration of the VS demo and the exclusion of supplementary information such as a digital observation of the VS office hour led to many participants’ oversight on the issue. An in-depth discussion on this issue might be necessary to help participants negotiate their understanding of interaction in VS.

Teacher feedback. Many participants expressed worries that the delay of teacher feedback would affect the learning process. They viewed the teacher’s immediate feedback as crucial and did not believe that VS could provide that type of feedback. Others commented
that teachers were responsible for giving feedback or correcting wrong information as displayed by students’ responses:

Though there is interaction between the teachers and the students and among the students, because of the time flexibility, not everyone is online at the same time. This means that a student that is doing his or her work cannot get immediate feedback. If they have a question they can e-mail the instructor, but they may not get a reply for a day or more. …a student in the middle of an experiment can’t raise their hand and say ‘I don’t get this’ or ‘what am I looking at’ or any of that. Obviously a student can’t just put their experiment on hold for two days while they wait for a reply from the professor. (Plum, F06, Demo)

My biggest concern about VS is the loss of the student-teacher relationship. Students that struggle to learn, or those that have questions about certain aspects of the lesson, may get left on the wayside due to an absence of the teacher’s ability to respond in real-time. (Kad, S07, Initial thoughts)

Only a few participants commented on the different quizzes used in the exemplary VS course. Those who noted the difference between learning and assessment quizzes quickly saw that quizzes could serve as a substitute for the teacher to provide feedback for the learning process:

I really like how she uses the quizzes as learning activities which let the students have feedback right away and then lets them retake it tell [sic] they get it right and learn that. (Cop, S07, Demo)

She did have quizzes that were single try but she also had quizzes that the students were aloud [sic] to take over until they got it right, and the teacher could give feedback on an individual basis. (Rich, S07, Demo)

I found it interesting when the teacher said she uses teaching quizzes and assessing quizzes. It is about using the quizzes to find out in what areas they may need assistance on. (Mun, F06, Demo)

A few other participants also noted at the end of their seminar that VS could be an effective mode of education if done right:

…So my conclusion is this: VS can be good, in moderation, when it is done correctly. My experiences haven’t been good, but that doesn’t mean there aren’t people out there who have benefited from VS. (Garv, S08, Summary)

I think the demo course proves that VS courses can be completely interactive and engaging as long as the teacher is willing to put the time into designing the course that way. In the demo course, it was very clear that the teacher put a great deal of thought into making it an inclusive classroom. She gave her students multiple ways to communicate with each other… (Sar, F06, Demo)

After watching this teacher, I can see that there are so many things that a teacher can do with their students in a VS environment that I never would have thought to be
possible before. I can see that I would be able to allow my students to interact with me and other students through different means of technology. (Mill, S07, Demo)

Overall, most participants realized that the learning feedback in VS could be provided by the VS teacher as well as learning quizzes and classmates’ posts. Those with prior VS experiences with high levels of interaction tended to show less concern about the loss of teacher feedback because they had actual experiences of interacting with their VS teacher “in order to get through the class successfully” (Egg, F06, Myth).

*Lack of rigor.* Another common preconception held by participants was the lack of rigor in VS courses. Participants who did not have prior experiences often perceived VS courses to be “easy,” “blowoff” or “an easy way to slack off.” In part, this preconception is linked to the previous preconceptions that VS courses do not require students to be actively engaged with other students or the teacher but instead have the freedom to “do whatever they want” in the course with little accountability because they would be isolated from the rest of the VS participants. Kli (S08, Initial thoughts) for example commented below:

My biggest concern about VS at this point is the thought of how intrapersonal it is and that it seems like a lazy way to learn. When I think of online classes, I usually think of courses people just want to take to get them over. There is no peer interaction and the response time between people in the class is delayed, unlike group discussion in the classroom.

Similar to these participants, those who did have prior VS experiences admitted that they too had similar perceptions before enrolling in their VS courses. Some, however, realized while taking their online courses that it was a misconception because they were required to put in more effort, and the teacher’s expectations were no less than those of teachers in a traditional classroom. The comments below illustrate some of their sentiments:

I did think that it would be an easier version of a fairly difficult class, and I was wrong, never again will I assume that online courses are easier than going to an actual class. (Hosc, F06, Myths)

But I have actually found some of them (myths) to be false after I took an online course myself. My online course was not easier than a traditional course; it was just as hard if not harder. (Egg, F06, Myths)

While prior experiences can change the participants’ preconceptions about the rigor of VS courses, it can also strengthen them. In the cases in which their prior VS courses were indeed
less rigorous than most exemplary ones, a few participants maintained their initial perceptions towards VS as illustrated below:

I think VS courses are seen as a way to slack off, at least at the college level. All the ones I have taken are really easy. Or the professors [sic] posts too much stuff it is overwhelming and the students never read it at all. (Sod, S08, Initial thoughts) In my experience, online courses were easier than regular course. There was less reading, less work, and less accountability. (Sod, S08, Myths)

Contrary to the participants who had only taken “easy” VS courses in the past, participants who had encountered both rigorous and non-rigorous VS courses tended to take a more balanced view. These participants realized that the rigor of VS courses depended on the teacher’s expectations and the course set-up:

My experience with VS is that VS classes could be very challenging or very undemanding depending on the teacher’s expectations and delivery. (Gonz, S08, Initial thoughts)
I have taken classes that I would qualify as easier than an [sic] bricks-and-mortar version of the same class, as well as virtual classes that are more difficult than the bricks-and-mortar version. This all depends on how dedicated the instructor is to the course and how he or she designs it. Just like traditional classrooms, many variables play into the difficulty of a course. (Long, S08, Myths)

After completing the seminar, many participants who perceived VS courses to be non-rigorous reported that they were surprised to see how inaccurate their preconceptions were and that VS courses could be just as rigorous as traditional in-class courses. While some participants were persuaded after reading the NACOL (n.d.) article about the myths of virtual schools, others were persuaded only after exploring the real-life VS cases (i.e., the exemplary VS course and the culinary case study). As Cor (F06, Summary) concluded in her summative report:

I’ve always considered VS classes to be more remedial…where a student takes easy (“blowoff”) classes. This, of course was my own bias about VS. However, after reading about classes like the chef internship and the online anatomy class, I can see how these teachers end up putting a lot more time into their classes because they work very hard to make sure the class isn’t just a ‘read this and then answer the questions’ kind of environment for students (which is what my past experience has been). When I started this unit on VS, I was rather against the idea of virtual schooling. I’m starting to see now, though, it does have applications to my content area and I would be interested to work with it more and perhaps try to develop my own course someday.
Overall, the combination of reading and exploration of effective VS examples helped to increase the participants’ awareness about academic rigor in VS. Most participants realized that academic rigor can be achieved in VS depending on different factors such as instructor’s dedication, course design, and learning expectations.

**Prior experiences, curriculum materials, and conceptual change – A further analysis**

This sub-section presents the further analysis of three purposefully selected participants for a closer examination at how prior experiences and the curriculum materials influenced their conceptual change process. They were selected because their backgrounds were varied and their cumulative journal reflections provided substantial data for further analysis. Also reported in this section are the instructor’s perceptions of the trend in pre-service teachers’ response to VS and the types of curriculum materials needed to match this trend.

*Megan.* Megan was a pre-service teacher in History. She noted that she had prior VS experiences in courses such as computer science, economics, biology, communications, and mathematics and found those courses to be varied in levels of rigor. She thought that VS was offered to everyone but best for courses that require more “teacher-centered instruction (or) factual topics because VS often does not allow extensive student-centered learning.” Her postings indicated that she had some knowledge about on-site coordinators or assistants, different formats of VS and strategies to prevent cheating in VS such as proctored tests or open-book assessments. In fact, Megan was only one of two participants that mentioned the need for on-site coordinators. She also realized that the rigor of a VS course depended on different variables (e.g. course design and instructor’s commitment) just like a traditional brick-and-mortar class. Her awareness of VS was likely to be due to her past experiences with VS courses.

In her initial post, Megan stated that she found the interaction in VS to be “forced” through required discussion boards and therefore “not genuine” because they often “become forums of students repeating or summarizing the same information – few students are interested in reading dozens of the same post or attempting to come up with unique responses to their classmates.” After reading the NACOL article (n.d.), she noted that she was not surprised about the myths. She thought the responses provided in that article included general
explanation and information regarding common myths so these responses did not persuade her to change her ideas about VS. Because Megan had taken several VS courses that were different from each other, her knowledge of VS was more than that of the targeted audience for this article who is assumed to have little or no information about VS. For Megan, readings that provided more in-depth knowledge such as research- or data-based articles or a comprehensive exploration of a VS course would have been needed to give her new knowledge that could challenge her existing ideas.

Following her exploration of the VS demo, Megan’s journal again reflected high level of awareness about VS. She noted that the VS course was very organized but could be overwhelming because of the amount of information. She recommended that the course units be released in parts and that on-site demonstrations and supervision should be included. Because this was an archived version of a VS course with the purpose of showcasing an exemplary course, Megan did not realize that the VS instructor had released the units according to scheduled dates and visited different remote sites to provide on-site demonstrations as well as regional laboratories where VS students physically gathered at one common location to complete experiments under the supervision of the VS instructor. Additionally, the VS demo did not capture the weekly office hour through the ICN that the VS instructor used to provide synchronized supervision, feedback, support, demonstrations, and assessments. Even though Megan did not see these happening in the VS demo, she had a good grasp about good VS practices as evident in her journal:

If I were to teach a VS course, I would do my best to ensure real-time interaction, either with local on-site coordinators with understanding of the material, teleconference, or a supplemental lab time that meets in person.

When summarizing her thoughts, Megan indicated that she would be willing to teach VS History even though she believed that it would be a challenge since she perceived middle and high school students as struggling to “stay engaged and see the relevancy of the course.” She also suggested some examples of how she could use different strategies and technologies to make the course engaging and interactive. She claimed that she had not had any VS experiences that resulted in “genuine, long-term learning … as in a more traditional classroom” but appreciated the flexibility it provided. Overall, her ideas about VS did not change because her extensive VS experiences had provided her with a realistic understanding
of VS, which included strengths and weaknesses as well as the variables that have to be considered as noted in her comment:

I believe that, as with most things, virtual schooling must be judged on a case-by-case basis, considering students, teachers, resources, opportunities, needs, and abilities.

Laura. Laura was a pre-service teacher in English. Like Megan, she noted that she had taken several online courses but her experiences had not been positive since they had been very confusing and had either “too little work or too much work.” She also claimed not to know her virtual classmates or professors very well. Also, she said that her personal experiences had led her to believe cheating was more likely to happen and VS courses lacked rigor. She was also concerned about the potential loss of student-teacher interaction.

After reading the NACOL article, she admitted that she shared similar perceptions about academic rigor and cheating based on her personal experiences. Despite her perceptions of prevalent academic dishonesty and lack of rigor in VS, she still demonstrated an open attitude towards VS as she commented:

If I still have these common perceptions after being an online student, doesn’t that mean they are partly right? It’s always possible I’ve just taken the wrong courses, though.

Laura was impressed with the VS demo and thought that it was set-up much better than any course she had taken. However, she was still concerned about the lack of face-to-face communication. As explained in the earlier section, the VS demo did not include a digital recording of how the VS instructor conducted weekly office hours on ICN. Had Laura seen this, she might have been less concerned about this issue. She believed that VS could be effective if done right and commented that the VS demo and the culinary case study provided good examples of how technology can be used to support VS. Nonetheless, she was a bit hesitant about teaching VS English herself because she preferred in-class face-to-face communication and discussion sessions and thought that VS was better suited for fact-based courses such as history and not for courses that required constant feedback.

Overall, Laura’s negative VS experiences had led her to perceive the prevalence of academic dishonesty and lack of rigor. However, her willingness to consider new information about VS helped to “open [her] mind to some of the ways VS can be better.” The curriculum materials in the seminar provided new information that helped her to conclude the following:
I understand that it gives people educational opportunities they may not have had otherwise. I think that if VS is done right (something I have yet to experience) it can be effective...So my conclusion is this: VS can be good, in moderation, when it is done correctly. My experiences haven’t been good, but that doesn’t mean there aren’t people out there who have benefited from VS.

Anne. Anne was a non-traditional pre-service teacher in French. She reported that she had work experience with curriculum development for a university and had recently applied for a teaching job at a large Midwestern community college. Her journals showed no indication of any prior VS experiences and she reported that she had never seen an ICN site. She believed that VS would work best for courses that “involved little interaction or few hands-on activities... [and that] few subjects fall into this category.” As a foreign language pre-service teacher, her biggest concern about VS was the issue of interaction, or more specifically the “lack of genuine and spontaneous interaction.” This concern was evident in all her journal entries where she consistently linked aspects of assigned curriculum materials to the importance of interaction and communication.

Anne appeared to have a preconception that VS was a digital correspondence course that involved students learning in isolation and instruction was conducted by technology applications rather than virtual teachers as evident in her journal:

As a language teacher, I see certain applications for things like rote memorization or viewing videos, but spontaneous communication is a paramount goal which cannot be attained without interaction between real people. [italics mine]

This perception was probably reinforced by her past work experience of drafting a correspondence course manual for a university as she wrote:

I can imagine transferring a lot of conventional lessons, book and language lab type of lessons to a virtual system. This would be somewhat similar to a correspondence course manual I once drafted for KU.

Throughout the whole seminar, Anne continuously reported that she was skeptical about VS. For example, in response to the NACOL article, she questioned the validity of the knowledge:

Always question your source. The debunking of the ten myths was done by the North American Council for Online Learning, which just might have some vested interest in the positive debunking of myths.
She also displayed skepticism after exploring the VS demo course and stated that she was unsure if “the goal of spontaneous communication in a second language can be attained using virtual methods.”

Despite the skepticism, Anne appeared to display some conceptual change after reading about the culinary case study. She liked that there was an instructor involved and that the ICN was able to support two-way instruction:

This appears to be an effective use of virtual schooling. The designers provided instruction and hands-on learning with area chefs who were willing to mentor students in the chefs’ kitchens so they had real opportunities to cook and have their work products assessed by an expert.

It was likely that Anne’s realization of the VS instructor’s presence and the availability of synchronized technology moved her away from the perception of VS as a digital correspondence course and this realization contributed to her willingness to consider teaching a VS course despite her reservations as she noted in her summary:

I have many reservations about virtual schooling, but that does not mean I would not consider teaching with it. …As a language teacher, real-time interaction is essential, so any system I would use must allow for simultaneous two-way interaction. The ICN (and perhaps other technologies I am unfamiliar with) provides this, so I would like to see its strengths and weaknesses.

Overall, Anne still showed strong reservations about VS after completing this seminar and two other seminars on VS. Her conceptual change was minimal compared to most other participants as she wrote:

I hate to end up where I started, but I am afraid that is the case. I see many positives about VS but most of my concerns have not been allayed. What surprised me most about much of the assigned reading and activities is the lack of skepticism about the value of VS. Many of the plusses advocated by the proponents of VS were assertions made without evidence, or detailed evidence. For example, they say many teachers report their interactions with students are increased or improved. How many? In what way are they enhanced? They argue that AP test results are better for VS learners, but do we know if this is a result of the method in which students learn or whether the population of those studying AP online differs from the students who take it in a regular class?

Her comments showed that, like Megan, she needed more in-depth information and she preferred to have knowledge about both the positives and negatives about VS before making any conclusions. In Megan’s case, the need for comprehensive information came from her
many experiences with VS that had provided her with a good understanding of VS. However, Anne did not have any VS experiences. It is possible that her situation as a non-traditional student provided her with work experiences that contributed to strong misconceptions about VS. She also displayed strong critical thinking skills as evident in her thoughtful questions about information sources and research methodology. These factors would have led to her need for a comprehensive look at VS. Because the goal of the seminar was to provide an introduction to VS, the curriculum materials would not have provided in-depth information to help Anne with her conceptual change.

Overall, the further analysis of these three pre-service teachers’ experiences have shown that the levels of prior experiences with VS differ greatly, and they can influence the way pre-service teachers perceive VS as an alternative mode of schooling. The analysis also looked the impact of the curriculum intervention on the conceptual change of these pre-service students. The following subsection focuses on the course instructor’s response to the curriculum intervention.

Jason. Jason was the course instructor for the pre-field experience course. I interviewed him in October 2008 after we had completed the data collection process. I also sent him follow-up questions via e-mail in June and July 2009. At the time of the face-to-face interview, he had completed his seminar on VS with his pre-service students in Fall 2008. He mentioned that he had integrated the topic of VS into his face-to-face seminars instead of conducting it through WebCT because I was not available to assist him, and he had more field-supervision responsibilities that limited the amount of technology preparation required. He thought the curriculum intervention was successful and that he “liked it when we did it on WebCT” (Interview). He found the curriculum materials useful but wished he had more time and better understanding of WebCT to make the experience more effective:

I believe it [the curriculum intervention] was successful, but in hind sight, we should have probably been more interactive and realistic to how virtual schools operate. The WebCT we built and used was typical for any course using WebCT. The problems for me were not having enough of a background working and designing with WebCT and what it could do along with the time requirement needed to be fully involved virtually. (Follow-up interview)

Although he was unable to conduct his latest seminars in WebCT, he continued to use the same curriculum materials from the WebCT seminars, and his responses during the
interview showed that he still strongly believed in the need for pre-service teachers to be aware of VS and that teacher preparation should reflect what happens in schools. In fact, he believed that it was necessary to incorporate some virtual learning when it came to the topic of VS because “investigating virtual schooling without going virtual seemed to be a contradiction” (Follow-up interview). He also advocated integrating the topic of VS into existing teacher education programs because “if you want virtual schooling to become used out there it has to be integrated and it has to be seen as valuable instead of an add-on” (Interview).

He noted that pre-service teachers’ prior experiences with VS had an influence in the preconceptions they brought to the teacher education program. He also noticed a difference in preconceptions, misconceptions, and concerns, such as future career and the viability of VS. Jason thought that more post-study pre-service students had awareness about VS because it was becoming more widespread and many of them had some VS experiences. Although there were still some post-study pre-service teachers who had bad experiences with VS, he perceived them to be less hesitant than the participants of this study because they understood how VS worked. Jason noted that the post-study pre-service teachers appeared to be more concerned about how to get the right skills that would allow them to teach online effectively compared to the participants of the study who were concerned about potential job losses. Therefore, he emphasized the need to incorporate curriculum materials and training that would help future pre-service teachers acquire necessary online teaching skills:

When we first started, we had to give them that knowledge [about VS]. Now, I think we actually have to put things in our teacher education program to show them how to use that, because they are becoming students who are doing online classes or they have web-blended or they’re using WebCT or some other management system out there to manage these classes. So they want to know how to do it because they’re going to go out in the classroom and be asked to do it. (Interview)

He also noticed that the post-study pre-service teachers expressed a lot of concerns about the technology, particularly how it is used. He added that they wanted more training in pre-packaged applications because they felt unprepared to create online courses from scratch:

…most of them said they would be comfortable teaching online classes because they’ve taken classes, but they would hope that the school had some kind of package thing that they could just plug into and do all those things. They said if they had to start from square one and all the technical stuff on top of the pedagogical stuff, they would be really hesitant, but they would still be comfortable doing it. (Interview)
Jason felt that teacher preparation needed to include both the technical and pedagogical aspects of VS in order to effectively prepare future pre-service teachers. He noted that the pre-service teachers were noticeably more confident with technology but did not know how to use it for teaching purposes. He advocated the revamping of existing courses to include VS as a topic and eventually creating a course specifically focusing on VS. He was disappointed that the TEGIVS project had ended because he believed more curriculum resources were needed to help prepare pre-service teachers for VS:

I believe it [the TEGIVS project] is a success as I have seen in the news over the past year or so that states, PK-12 schools, and higher education institutions are implementing more virtual schools and developing programs to train teachers for them. They are even looking at virtual field experiences as we investigated. A disappointment is that what we have investigated is very much at a stand still right now at our university. (Follow-up interview)

Overall, Jason noticed a change in the pre-service teachers’ attitudes towards VS. He perceived that the level of awareness about VS was higher among the later group of pre-service teachers and attributed that increase to more personal VS experiences and widespread publicity of VS. The early concerns about VS being a potential career threat and the viability of VS based on the responses of the participants of this study seemed to be less common while the acquisition of adequate technological skills for creating and teaching online courses appeared to be a more common concern for the later group of pre-service teachers. This change in concerns between the participants of the study and the post-study group suggests that pre-service teachers’ common misconceptions, preconceptions, and concerns about VS can differ and should therefore be addressed regularly from group to group so the curriculum intervention can be revised to include the most relevant curriculum materials (e.g. relevant reading articles and learning activities) to match the common misconceptions, preconceptions, and concerns of each group.

**Discussion**

Pre-service teachers enter their teacher education program with years of experiences as students. They rely on these experiences to formulate their preconceptions, misconceptions, and concerns about VS. In order to increase the pre-service teachers’
awareness of VS, a curriculum intervention using related readings and learning activities was implemented. This section discusses the influence of three variables from the proposed framework on the conceptual change process. The three variables are: 1) prior experiences, 2) curriculum materials, and 3) motives, goals, and institutional sources.

**Prior experiences**

This study highlighted the strong influence of prior VS experiences. As Knowles and Holt-Reynolds (1991) and Knowles and Cole (1996) pointed out, pre-service teachers relied on their personal histories to shape their conception of education. In this study, the pre-service teachers entered with varied levels of previous experiences with VS. Some had little or no exposure to VS while others had extensive experiences with online courses. Those with little or no awareness of VS were less likely to have strong preconceptions about VS, and were therefore able to accept the new knowledge as intelligible, plausible, and fruitful more easily than those with prior experiences. On the other hand, those with bad experiences tended to voice skepticism and hesitance. This finding supported Knowles and Holt-Reynolds (1991) who said that pre-service teachers used critical past experiences to predict the value of new educational ideas. Thus, the negative experiences would have caused the pre-service teachers to have strong preconceptions about VS. Meanwhile, the pre-service teachers who had both good and bad experiences held more realistic views about VS and often concluded that the effectiveness of VS depended on factors similar to those in a traditional class setting such as the effectiveness of the instructor, the curriculum design, and the course materials.

The amount of prior VS experiences can also influence the type of readings and tasks that should be included in the curriculum. The findings of this study showed that pre-service teachers with little or no prior VS experiences were generally satisfied with the amount and quality of information provided as an introduction to the concept of VS. However, to persuade those with more VS experiences to accept VS as an effective education concept, more comprehensive information including research-based articles and comparative publications that discuss both strengths and limitations are required. Therefore, the types of reading materials that should be included in any course should partly depend on the level of prior VS experiences of the intended audience. In situations where the general goal is to
provide pre-service teachers with an introductory look at VS, relevant supplementary materials could be provided to those with more VS experiences to accommodate their existing knowledge.

Curriculum materials

The findings in this study show some common recurring themes in the journals of the pre-service teachers. These common themes include future career, academic, and pedagogical issues and these themes highlight preconceptions, misconceptions, and concerns held by most of the pre-service teachers in this study. The study shows that the curriculum materials presented in the curriculum intervention were useful. It also shows that some of the preconceptions, misconceptions, and concerns could be corrected through the provision of relevant readings and learning tasks.

As the proposed framework suggests, the pre-service teachers would be able to accept VS as a new educational concept as long as they find the new provided information to be plausible, intelligible, and fruitful. However, the number of reading materials and learning tasks provided in the seminar was restricted by the allotted time. Consequently, some ideas and concerns that were raised, such as the issues of equity and cost, were not addressed and they remained after the seminar ended. A further extension of such curriculum intervention with other complementary and relevant curriculum materials (e.g. digital scenarios http://ctlt.iastate.edu/~tegivs/TEGIS/VSLab/all%20scenarios.html) would likely help to address more misconceptions, preconceptions, and concerns about VS. Additionally, the findings show that concerns about VS are likely to differ as the concept of VS becomes more widespread and as more proficient users of technology emerge. Since Howey and Zimpher (1996, p. 483) recommended that a fundamental principle for learning and learning to teach should “begin where one is,” a review of pre-service teachers’ thoughts about VS should therefore be included at the start of any course work so the relevant readings and learning activities can be included to trigger their dissatisfaction with their existing knowledge.

In addition to considering the quantity, the type of learning tasks is also equally important for the conceptual change process. Readings and online exploration of archived course demos cannot fully provide a comprehensive overview of VS. Many pre-service teachers believed they understood how VS worked by exploring the VS demo, but their
comprehension was limited to what they observed in an archived course. Although the VS demo course was effective in showcasing a good model of VS, it did not provide the pre-service teachers with a complete understanding of how VS office hours worked or how online face-to-face interactions were included to facilitate learning and assessment activities. Other complementary materials, which were later developed for the TEGIVS project such as a digital video of VS office hours (e.g. http://ctlt.iastate.edu/~tegivs/TEGIVS/virtual_office_hour_1.html) or a frequently-asked questions (FAQ) page by the same VS instructor (e.g. http://ctlt.iastate.edu/~tegivs/TEGIVS/GailFAQ.html) could be added to provide a more comprehensive look at the exemplary model. Additionally, the inclusion of VS teachers, VS site-facilitators, and/or VS students as guest speakers as well as field experiences both virtually and on-site would also benefit the pre-service teachers’ learning experiences richly because they would be able to observe from different perspectives. All these added activities can offer pre-service teachers more opportunities for exploration of the new concepts.

Besides that, the findings also show a need to include curriculum materials reflecting VS in different content areas. The materials used in this study provided convincing information to many pre-service teachers. As a result, they were able to accept the possibility of VS as an alternative education model. However, some were not ready to accept the viability of VS in their content area because they were unable to apply the knowledge from the VS demo and VS case study that were based on science and culinary arts. If the goal of the curriculum intervention is to go beyond increasing pre-service teachers’ awareness of VS, then additional curriculum materials should be included. These materials could include VS demos or relevant publications or literature in different content areas (e.g. http://ctlt.iastate.edu/~tegivs/TEGIVS/resources/demosCI280A.html) so pre-service teachers could explore the materials within their specialization.

Motives, goals, and institutional sources

The proposed framework includes the influence of variables such as motives, goals, and institutional sources on the conceptual change process. Strike and Posner (1992) stated that learners have motives and goals that can either promote or frustrate conceptual change. The findings of the study illustrate how the motives and goals can influence the pre-service
teachers’ reception of VS. Since most pre-service teachers enter the teaching education program with the goal of gaining teaching credentials to secure a job in the future, misconceptions of VS likely lead to concerns that VS would be a threat to their future job prospects. Strike and Posner said that the selection of resources and learning tasks should take these motives and goals into considerations so misconceptions and concerns can be addressed. In terms of VS, concerns about the loss of future job prospects due to VS can be addressed through relevant curriculum materials that illustrate the role of a VS teacher and the new skills and career opportunities in VS.

In addition to motives and goals, Strike and Posner (1992) also pointed out that institutional sources can influence learners’ belief system. In this study, the faculty’s view of educational technology is an example of institutional source that can influence the pre-service teachers’ perception of VS. The impact of institutional sources, however, is harder to address than motives and goals, especially if it involves different departments. Since pre-service teachers learn through modeling in their teacher education programs, pedagogy in their primary teacher education program is especially influential. If technology is not used or modeled effectively, it can reduce the level of dissatisfaction about current educational practices, resulting in little need to consider alternative educational ideas. Furthermore, if technology is only advocated in the general teacher education department, conceptual change about VS (if any) is unlikely to last or transfer into future practices because Sadera and Hargrave (2005) stressed the need for pre-service teachers to continue their exploration and reflection about the alternative concepts during the post-dissatisfaction stage to facilitate long term conceptual change. Otherwise, the duration of exposure to the alternative idea that is too brief may only result in superficial and non-sustainable changes as pointed out by Tillema and Knol (1997) and Sadera (2001).

Conclusion

This study reviewed several conceptual change theories in education and proposed a conceptual change framework to help pre-service teachers increase their awareness of VS. The proposed conceptual change framework shows that personal histories of pre-service teachers and prior experiences of VS can influence their misconceptions, preconceptions, and
concerns about VS. The findings of this study support the proposed framework, which suggests that difference levels of prior VS experiences can lead to different misconceptions, preconceptions and concerns. The proposed framework also recommends that the selection of curriculum materials should depend on the common misconceptions, preconceptions, and concerns. As the findings show that misconceptions, preconceptions, and concerns about VS can vary from group to group, teacher educators should therefore address the common misconceptions, preconceptions, and concerns according to each group of pre-service teachers in order to select the curriculum materials and learning tasks that would be most effective in facilitating the conceptual change. Furthermore, the rich and thick descriptions of this study show that their preconceptions, misconceptions, and concerns can be mostly addressed by carefully selected readings and learning tasks that help to trigger dissatisfaction with their current existing knowledge of VS. If pre-service teachers feel dissatisfied with their existing knowledge, they are more likely to be open to new information. And if they find the new information to be intelligible, plausible, and fruitful, they are likely to accept VS as an alternative educational concept. Finally, the findings of this study also support the idea of affective and external influences such as motives, goals, and institutional sources. Since the career goal of the pre-service teachers is to become a future teacher, teacher educators should, therefore, integrate preparation for VS into their curriculum because pre-service teachers need basic skills and knowledge of VS to be prepared for teaching in the 21st century classroom.

This study relied on secondary data from three sets of pre-service students, which led to limitations in the study. There were no follow-up interviews with the pre-service students, which could have provided more supportive evidence. Additionally, an observation or a video recording of the in-class discussion after the online curriculum intervention could have yielded richer insights and stronger triangulation of data. Future replication of this study should include these research activities in their methodology.

The study highlighted the need for more research in the area of pre-service teachers’ preconceptions, misconceptions, and concerns of VS as practices with education technology continue to evolve, and as pre-service teachers’ level of exposure to technology as students and as users continue to increase. Future studies should also examine whether nontraditional
pre-service teachers require different types of curriculum materials on VS compared to traditional pre-service teachers and whether age and work experiences influence their conceptual change process. Researchers should also compare the conceptual change process of pre-service teachers according to their declared specialization to see how the content area can influence the acceptance or rejection of VS. Finally, more studies are needed to understand how affective factors (e.g. motives and goals) and external factors (e.g. institutional and social sources) can impede or facilitate the conceptual change process.

References


Compton, L., Davis, N. and Mackey, J. (in press) Field experience in virtual schooling - To be there virtually. *Journal of Technology and Teacher Education*.


Acknowledgements

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acknowledge support from all participating organizations, particularly the Iowa State University Center for Technology in Learning and Teaching. Additionally, I would like to thank Dr. Niki Davis for the opportunity to work on the project and for her guidance and support. I would also like to express my appreciation to Gail Wortmann, our wonderful virtual cooperating teacher as well as Dr. Ann Thompson, Gayle Huey, and Jason Follett in their dedication to help me with this research.
APPENDIX 1: CURRICULUM MATERIALS DEVELOPED AND USED IN TEGIVS

Curriculum materials developed for pilot seminar -
http://ctlt.iastate.edu/~tegivs/CI280A/introduction.html

Curriculum materials developed for all three seminars including Part 1 that was used in this study - Extended version (Fall 2006) Parts 1-3.
http://ctlt.iastate.edu/~tegivs/TEGIVS/curriculum.html
APPENDIX 2: OVERVIEW AND LIST OF THE CURRICULUM MATERIALS USED IN THE FIRST SEMINAR (PART 1)

(see also http://ctl.t.iastate.edu/~tegivs/TEGIS/Field_Experience/Virtual_Schooling/CI280A_Fall_2006_Part_1.pdf)

<table>
<thead>
<tr>
<th>TASKS</th>
<th>Fall 06</th>
<th>Spring 07</th>
<th>Spring 08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial thoughts</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Students post their initial thoughts about VS.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 1 – Top 10 myths</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Students read an article and post their responses to the myths.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 2 – Exemplary VS course</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Students explore a demo of an award-winning VS course and watch a recorded interview with the VS teacher, then post their thoughts about the pros and cons, and the possibility of teaching a VS course.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 3 – VS culinary case study</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Students read a case study of a VS culinary course and post their thoughts about the effectiveness.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 4 – Summative reflection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Students reflected and summarized about the potential of VS, their potential future engagement in a VS career, and the issues.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 3: SEMI-STRUCTURED INTERVIEW QUESTIONS

Background Information
1. What’s your background in teacher preparation?
2. What is your philosophy about teacher preparation and field experience?
3. How did you get involved in Virtual Schooling? How long have you been involved with VS?
4. What is your perception about the future of VS and the state of teacher preparation?
5. Which of the TEGIVS implementations related to VS that you have been directly or indirectly involved in? What were your roles?

Virtual Schooling Seminars
6. Do you think that ALL pre-service teachers should learn about VS? Why/Why not?
7. Are there changes that you noticed among the pre-service teachers in their attitudes towards VS?
   a. How has it changed?
   b. What were their reactions before? (Perceptions, misconceptions?)
   c. How did they react after?
   d. Did they notice anything related to VS during their field experience after their seminars on VS?
8. What do you think of the seminars on VS that we’ve incorporated into the CI280A curriculum?
   a. What do you think can be improved?
   b. What were the positive aspects of integrating the seminars?
9. What are the key areas that pre-service teachers should be aware of in VS? (Pedagogy, Technology, Evaluation, Collaboration, etc)
Virtual schooling, or the practice of offering K-12 courses via distance technologies, has rapidly increased in popularity since its beginning in 1994. Although effective interaction with and support for students in these environments requires a unique set of skills and experiences, teacher education programs rarely include teaching and facilitation competencies for virtual school education. Even less has been offered in terms of virtual field experience. A pilot virtual field experience enabled teacher candidates to observe how a high school science course was taught by an exemplary teacher using blended technologies. Key findings show that the virtual field experience helped to clarify misconceptions, preconceptions, and concerns and led to a better understanding of VS teaching skills and teacher’s role as well as the supportive role of technology. Teacher candidates also reported an increased interest in VS and learning goals at the end of the experience. Five key elements were also identified as contributive to the successful experience, i.e. putting the “virtual” in the virtual early field experience, increasing awareness through external and internal informational gathering methods, including self-paced and guided observation, providing guided hands-on experiential learning, and including on-site observation.

Introduction

Virtual schooling (VS) in the United States (U.S.) for K-12 students, an innovation that began just after the Internet went graphic with Web browsers in 1994, has increased exponentially within many states and school districts (Barbour & Reeves, 2009; Clark, 2001; Davis & Ferdig, in press; Ferdig, Cavanaugh, DiPietro, Black, & Dawson, in press; National Forum on Educational Statistics (NFES), 2006; Roblyer, 2003, 2008; Setzer, Lewis, & Green, 2005; Watson, Gemin, & Ryan, 2007; Zucker & Kozma, 2003). Davis and Ferdig (in
press) noted that 44 states in the U.S. offered VS opportunities to their K-12 students with doubling enrolments yearly in up to 20% of virtual schools in the last few years. In 2007, Watson, et al., reported that “forty percent of the online programs responding to a recent survey reported annual growth of over 25% in the 2006-2007 school year, and half of these programs reported growth of 50% or higher” (p. 10). They predicted that the number of students involved with VS would continue to increase and may even be amplified by legislation in some states that require high school students to have some form of online experience prior to graduation.

The VS movement seems to be redefining what it means to be “in school” (Roblyer, 2008) and who the key players are (Ferdig, et al., in press). There is evidence of different roles emerging in the virtual classroom besides the VS teacher, including a VS site facilitator in the students’ school (Davis & Niederhauser, 2007; Ferdig, et al, in press; Harms, Niederhauser, Davis, Roblyer, & Gilbert, 2006; Hannum, Irvin, Lei, & Farmer, 2008). Many “virtual schools and other organizations that offer online courses and other forms of distance education to K-12 students are eagerly seeking to recruit new staff to match the demand for high quality VS in many U.S. states” (Davis & Rose, 2007, p. 7). These changes have placed new requirements on teachers entering these 21st century environments. Teacher education programs, however, have a gap, leaving most new educators unprepared for the new competencies required to teach in virtual classrooms (Barbour, Kinsella, & Toker, in press; Davis & Ferdig, in press; Smith, in press). The National Educational Association (NEA) (n.d.) was concerned that most teacher preparation programs “rarely include courses either about online teaching, or conducted through distance teaching” (p. 3) and most of the 86,000 new teachers that enter the profession each year, do so without online teaching skills in their professional repertoire. Smith, Clark, & Blomeyer (2005) reported that “many teachers currently teaching in online environments lack both the theoretical and practical understanding and are ‘learning on the job’” (p. 59). Since virtual school experiences over the past decade have shown that effective virtual teachers have qualities and skills that often set them apart from traditional teachers, it would be foolish to assume that “people who have never taught in this medium can jump in and teach a class … A good classroom teacher is not necessarily a good online teacher” (Wood, 2005, p. 36). Davis and Rose (2007) reported that
common misconceptions about VS that included the expectations of virtual schools that “any regular classroom teacher… [could be] qualified to teach online” and “newly qualified teachers who learn about virtual schooling in their pre-service programs will be ready to teach online when they graduate” (p. 8). Without deliberate exposure and virtual field experience, pre-service teachers cannot be expected to transfer their theoretical knowledge into practice.

A consortium of teacher education programs have collaborated to improve their teacher education programs to better prepare their pre-service teachers for this new form of education. This paper reports a case study of a pilot virtual early field experience designed to expand pre-service teachers’ knowledge, experience, and preparation for VS, which is also relevant for the induction of new teachers and VS site facilitators in VS. To showcase good practice, pre-service teachers were placed with an exemplary teacher from Iowa Learning Online (ILO) who won an award for her online high school course in 2005 (http://www2.blackboard.com/exemplary/viewpage?name=exemplary_2005_wortmann) and was Iowa’s Teacher of the Year in 2001.

**Field Experience and Virtual Schooling**

Traditionally teacher education has placed a very high value on various forms of supervised field experience. These experiences are interspersed between blocks of time devoted to theory based courses and allow teacher candidates to contextualize their theory learning and “observe [good practice] and work with real students, teachers, and curriculum in natural settings” (Huling, 1998, p. 2). Huling likened field experience in teacher preparation to internships and residencies provided to medical students. Field experience is part of the learning sequence that scaffolds the transition to a teaching role and provides the opportunity to link theory and practice (McIntyre, Byrd, & Foxx, 1996). It involves the initial observation of an experienced and competent teacher role model followed by post observation discussion to clarify and usually expand upon the teacher candidate’s observation insights. When part of a practicum, this discussion will often be followed by cooperative planning involving a single teacher candidate and the associate (cooperating) teacher.
In teacher education, there are different types of field experiences. Two main types are the early field experience and the student teaching experience. These are different from clinical experiences, which are implemented in more tightly controlled educational settings such as clinics and laboratory schools. Huling (1998) defined early field experience as field experiences prior to the student teaching experience with the primary focus on observation. On the other hand, student teaching experience requires teacher candidates to assume more teaching responsibility “under the joint supervision of a cooperating teacher and a university supervisor” (p. 2). In the early stages, responsibilities typically include lesson planning with focus upon the needs of a group within the class and early teaching experiences involving teaching a single lesson or series of lessons to a group rather than the whole class. Such lessons will often provide the teacher candidates with the opportunity to focus on aspects of lesson delivery such as group management or questioning skills.

McIntyre, Byrd, and Foxx (1996) stated that constructivist teacher education programs should create field experiences that facilitate the growth of teacher candidates through experiences, reflection, and self-examination rather than a positivist program that requires the teacher candidates to assume practices mandated by those in authority. They added that field experiences should not only enable teacher candidates to observe teaching as practiced by experienced teachers but also to practice reflectivity. They agreed with Bullough (1989) that reflective field experiences should begin during the first semester or quarter of the teacher preparation program.

Teacher candidates bring preconceptions with them from their personal histories into the teacher preparation program. These preconceptions that were influenced from their years of experiences and exposure to different teaching and learning situations and contexts may cause them to have preconceived images that are at odds with realities and need to be challenged and corrected (Knowles & Cole, 1996). Field experiences provide “the first formalized opportunity for pre-service teachers to verify, challenge, and modify their preconceptions” (Knowles & Cole, 1996, p. 654). Additionally, such experiences help the teacher candidates to realize that “schools, as professional communities, are made up of numerous persons in various roles: students, parents, administrators, professional and non-
professional support staff and other teachers in the schools as well as members of the professional community at large” (p. 659).

VS, a new mode of education that has emerged in the 21st century school, is contentious and has led to many misconceptions about virtual schools (Charania, 2009 in preparation; NACOL, n.d.) professional and organizational development (Davis & Rose, 2007) as well as equity issues (Rose & Blomeyer, 2007). Additionally, the lack of standards and benchmarks in distance education courses may have led to serious misconceptions about the quality of online and/or distance learning. Pre-service teachers who may have had negative or poor experiences with online or distance learning in the past would certainly have preconceptions that need to be addressed through field experiences specifically for VS. Moreover, changes in roles in virtual classrooms, such as the complementary roles of the VS teacher and the VS site facilitators, cannot be observed in traditional field experiences. Also, without the teacher and students in one traditional classroom setting, assigning teacher candidates to a brick and mortar school for a field experience emphasizing VS would be pointless. Therefore, an alternative form of field experience is required to capture the reality of VS. In their guide to teaching online courses, the NEA (n.d.) suggested that pre-service online “student teaching” might include the following:

- “Research on online instruction in the pre-service teacher’s academic discipline and on the learning and behavioral characteristics of the grade level of the students the novice teacher will instruct;
- Experience with and research into different delivery platforms, and examination of the pros and cons of each;
- Experience with self-paced “demos” of courses;
- Auditing professional development training for online instructors, and
- Student-teaching opportunities in online classes – a 15-week commitment in which a student learns course content, is mentored by an experienced online instructor, and, with constant supervision by a “master teacher” of record, has the opportunity to “practice teach” online.” (p. 13)

To summarize, there is evidence that the new mode of learning at a distance is spreading in the 21st century schools, that new complementary roles are emerging, and that
teacher educators need to ensure a quality learning experience for the teacher candidates in teacher education programs. Field experience mentored by a cooperating teacher with oversight from a university supervisor is an important aspect of preparing future teachers, and a variety of field experiences are sought where possible. However, few future teachers are prepared for this new mode of teaching since many teacher education programs provide traditional field experiences but do not include any training or field experiences for VS in their curriculum. Therefore, an early field experience conducted via virtual technologies was conceptualized as an attempt to provide pre-service teachers with a better understanding of VS and the necessary skills needed to be effective 21st century teachers.

**Background of Case Study**

An innovative national project to develop a model for US teacher education that includes VS as a model of schooling created the opportunity for this case study. The project “Teacher Education Goes Into Virtual Schooling” (TEGIS). TEGIFS, a three-year project led by Iowa State University's (ISU) Center for Technology in Learning and Teaching and supported by the U. S. Department of Education’s Fund for Improvement of Postsecondary Education (FIPSE). In addition to ISU, project partners include the University of Florida, the University of Virginia, and Graceland University. The goal of the project was to prepare pre-service teachers to implement effective VS curricula in three VS roles: facilitator, teacher, and designer. As part of the project goal, a team of collaborators consisting of VS teachers and consultants, teacher educators, a field experience director, and a field experience supervisor from partner teacher education programs actively participated in discussions to conceptualize new curricula that would help to improve the state of preparedness of pre-service teachers for VS. As a result, two new innovations were implemented: a) virtual seminars on VS incorporated into an existing course in pre-student teaching experience, and b) virtual early field experience. This case study looks at the implementation and impact of the virtual early field experience. The virtual early field experience was created to provide pre-service teachers with opportunities to observe an award-winning exemplary virtual teacher and her virtual classroom. A separate case study documents the implementation and impact of the virtual seminars on VS in an existing pre-student teaching experience course.
In this case, a pilot field experience centered on the topic of VS was created and offered virtually. The central purpose of this case study was to understand what impact this virtual early field experience had on the teacher candidates’ understanding of VS through an examination of the participants’ and researcher’s reflective journals in this pilot virtual early field experience. Semi-structured interview data from the virtual cooperating teacher and a university field experience director were also used to provide additional insights on this experience and the future adaptations of this field experience. Two general questions were developed to guide the data analysis and interpretations:

1. What impact did the virtual early field experience have on the teacher candidates’ response to VS?
2. What elements of this virtual early field experience were effective and how can it be improved?

Methods

A qualitative case study methodology was employed to gain an in-depth and holistic understanding of the impact of the virtual field experience on the participants and possible improvements to better understanding of VS (Esterberg, 2002; Merriam & Associates, 2002). The primary data source used to provide rich and thick descriptions were students’ reflective journals, postings online, and discussion forum responses to the selected readings. Semi-structured interviews were also conducted with the participating VS teacher and the field experience director at the participating university. Additionally, the researcher’s journal was used to provide additional insights.

Participants

The participants of this case study were selected using convenience sampling. Although Patton (1990) warned against its use because he considered it to be neither purposeful nor strategic, Weiss (1994) argued that convenience sampling may be the only feasible way in some situations, for example, in cases in which “a category of people who are relatively rare in the population and for whom no data on membership exists” are being studied (Maxwell, 2005, p. 89). In this case study, convenience sampling was necessary because only the two pre-service teachers, one graduate student, and one VS cooperating
teacher who participated in the pilot experience could provide the necessary data. In addition to the convenience sampling of these four participants, a university field placement director was also included as a participant using the method of purposeful sampling. She was included in this study because of her vast experience with field experiences and her critical input during the brainstorming stage of this pilot field experience. She also provided useful resources for the curriculum development stage to ensure that the field experience would meet the goals that were in line with the university’s teacher education program. These selected participants provided data from three complementary perspectives: VS student teacher, VS teacher, and the teacher education administrator.

To protect the anonymity of the student participants, pseudonyms will be used. The two pre-service teachers were both traditional female undergraduates enrolled in an early field experience course with an emphasis on technology. Mary and Helen, both in their early 20s, participated in this pilot field experience to accumulate credit hours as part of their early field experience course requirement. Robin, on the other hand, was a non-traditional master’s level graduate student in her late 20s who had teaching experience at the college level but little experience with teacher preparation at the K-12 level. As part of her independent graduate level study, she was asked to participate and complete all learning activities in this pilot field experience as if she were a pre-service teacher. She was also required to provide feedback and recommendations at the end of the course to help in the course revisions. To minimize confusion, both pre-service teachers and the graduate student will be referred to as teacher candidates from this point forward.

The VS cooperating teacher, Gail Wortmann (real name used with permission) was Iowa’s Teacher of the Year in 2001 and has vast teaching experiences in both traditional and virtual classrooms. She is currently the lead teacher at ILO where she has helped to develop several online courses including her award winning Anatomy and Physiology course. Her other experiences include faculty mentoring and evaluation of teacher preparation programs. Because she was an active collaborator in the TEGIVS project, she agreed to be a VS cooperating teacher for this pilot field experience.

The other participant in this case study was the university field placement director, Gayle Huey (real name used with permission). She holds several licensures in various states
including Iowa. Her extensive experience includes 18 years of traditional classroom teaching and more than 18 years of working with practicum students at the university. She has also developed many models for early field experiences and student teaching including work with content-based cohorts, urban sites and international student teaching. She believes in accountability for both student teachers and partner schools. She was also an active TEGIVS project collaborator and provided critical information for the field experience team.

Lastly, I played the role of a participant researcher. I conducted my observations concurrently with my responsibilities as the field experience supervisor. The student participants involved were informed of my intentions from the beginning, and they gave their permission to participate in this research. In a later section of this paper, I provide additional information about myself as a researcher and the multiple roles I played in this case study.

Course structure in the VS field experience course(s)

Two different versions of this virtual early field experience course were created. For easy referencing, these two versions will be referred to as Version 1 (V1) and Version 2 (V2). Both versions were created in fall 2007. V1 was offered as a one-credit independent study (24-hour study) for a graduate level student while V2 was offered as a 10-hour field experience in conjunction with an existing undergraduate early field experience. (See Appendix 1 for a summary outline of both versions and Appendices 2-3 for the learning modules.) Both versions were created in the university’s learning management system, WebCT, and access was granted using each participant’s university ID and password. V1 was divided into nine learning modules while V2 was divided into five learning modules. Both versions ended with a summary report from participants.

Data Collection

I used multiple data collection procedures for this study. The primary data tool was WebCT Vista, the learning management system used to manage all the curriculum materials in the learning modules and participants’ responses. The teacher candidates who participated in this study in fall 2007 and spring 2008 were required to write their weekly reflections and their summative reports in their respective journal area after completing the scheduled tasks in their learning modules. All journals were electronically archived automatically. Because I
was the field experience supervisor, I was able to retrieve the electronic journals after the course had ended. These reflections provided rich qualitative data that reflected the participants’ thoughts and reactions after completing the selected assigned readings on VS, their observation of the VS course, and their participation in the virtual and/or on-site tasks. Besides that, I also had access to the video recordings of the two synchronous sessions (the VS introductory session and the VS office hour) as well as screen captures of the Skype text messages, which were converted to digital images.

In addition to the reflective journals from the teacher candidates, semi-structured interviews were also conducted during summer 2008 with the two other participants, namely the cooperating VS teacher and the university field placement director. Open-ended questions were used to probe their thoughts about, and their reactions to VS field experiences. With the VS teacher, the semi-structured interview was conducted via e-mail. A first list of open-ended questions was sent for her response via e-mail. Follow-up questions were added to the same document that contained her initial response so she could refer to her previous responses. During the same week, a face-to-face semi-structured interview was conducted with the university field placement director in her office. The interview lasted approximately an hour and was recorded using a digital audio recorder. The interview was transcribed the following week and follow-up questions were conducted via e-mail throughout the analysis process as they arose.

I also maintained my researcher’s journal, which included ruminations of my “experiences, ideas, fears, mistakes, confusions, breakthroughs, and problems” (Spradley, 1980, p. 71) based on the multiple roles I played including participant observer, curriculum developer, and field experience supervisor. In addition, I kept all my e-mail correspondences with all the participants, which allowed me to keep track of the data chronologically.

**Theoretical Framework**

For this case study, I utilized two complementary frameworks as “theoretical lens[es]...to guide [my examination of] what issues are important to examine [and] how the final accounts need to be written” (Creswell, 2003, p. 131) : a) an experiential learning framework (Knowles & Cole, 1996) and b) a constructivist approach to teacher preparation.
(McIntyre, Byrd, & Foxx, 1996). These two frameworks were selected because they fit the experiential and constructive nature of the field experience. In this section, I outline key points in the two frameworks that proved to be helpful in my data analysis process.

The first theoretical framework, in Figure 4.1, emphasizes a cyclical yet spiral movement in the learning cycle (Knowles & Cole, 1996). There are two parts to this framework. As seen in 4.1(a), the basis of the cycle is the personal experience and practice of the learner. This is followed by information gathering and documentation that assist the learner in making critical reflections and analysis on the experience that will eventually help to inform future practice. Figure 4.1(b) shows the whole framework, which includes several cycles of field experiences that facilitate the development of a reflexive teacher. As stated in the framework in Figure 4.1, “learning is increasingly enriched by the experiential learning process (represented by the ‘upward’ spiraling movement).
The experiential learning framework also requires teacher candidates to reflect and analyze their field experiences and compare personal histories with new information gathered during the field experiences. Based on their reflections and analyses, they then formulate personal theories of teaching and learning that would influence their future practices. This is similar to the constructivist approach to teacher preparation (McIntyre, et al., 1996) that emphasizes the development of the prospective teacher through experiences, reflection, and self examination. This constructivist approach to teacher preparation, like the experiential learning framework, also recognizes the influence of personal histories on professional choices. McIntyre, et al., therefore, emphasize restructuring field experiences that allow teacher candidates to engage in reflective practices in conjunction with observation of real practices by experienced teachers so they “can act on their decisions in the spirit of praxis [and] begin seeing through a teacher’s eyes and consider responses in light of practical, social, and ethical consequences” (p. 172).

Based on these two frameworks, I identified several key phrases that helped to scaffold my data analysis and structure my final findings. These key phrases included personal histories, information gathering, reflective practices, and informed actions.

**Data Analysis**

I conducted the data analysis in three phases. The first phase was the preliminary analysis that was conducted throughout the data collection period. The second phase was the open coding process to identify key phrases, followed by a focused coding process to look for correspondences between two or more phrases to establish patterns. Finally, the third phase was to link back some of the findings to the key ideas in the two selected theoretical frameworks.

During Phase 1, I conducted preliminary analysis of the reflective journals throughout the data collection period. Since I was reading the participants’ weekly journals as their field experience supervisor to ensure they were completing their tasks and to address any concerns, I was able to get an overview of what the participants were noticing and concerned about. Also, because this case study was part of the bigger TEGIVS project, I shared the
developments and progress of this study during weekly project meetings with the principal investigator, who was also the director of the Center of Technology for Learning and Teaching at the university, and three graduate research assistants who were doctoral and master’s students in the Department of Curriculum and Instruction. The process of reporting about the case study helped me in the initial stages of thinking through the development and implementation as well as the data collection process. The support of the project team, who were all immersed in issues relating to VS, allowed me to raise questions and concerns, and their probing for details allowed me to report my initial reactions after skimming through the reflective journals. This process of sharing helped me to clarify part of my emerging understanding of this case study. Additionally, a conference presentation of this study in its early stages also helped me to organize my thoughts and get useful feedback from others in the field.

During Phase 2, the reflective journals and summative reports were compiled, printed, and organized according to participants and according to learning tasks. The recorded semi-structured interviews were transcribed and all responses to the interviews were compiled and printed. I then conducted open-coding on these data. Using significant ideas from phrases, sentences, and paragraphs, I coded the data with key words that represented those ideas. Examples of key words were ‘misconceptions,’ ‘beliefs,’ ‘change,’ ‘knowledge,’ and ‘technology.’ Following this coding, I grouped those key words into larger ideas that formed my themes and proceeded with focused coding, in which I went back to the data to look for specific instances that would clarify the themes further.

In Phase 3, I referred back to the key ideas in Knowles and Cole’s (1996) theoretical framework to link the findings under the four aspects of personal experience and practice; information gathering and documentation; reflection, analysis, and formation of personal theories; and informed action. The use of the framework in Phase 3 to guide my analysis allowed me to minimize researcher bias. And to practice reflexivity, I kept my research notes along with my field experience supervisor notes. Finally, to promote trustworthiness, I relied on peer review by sharing my ideas and preliminary coding notes with my project collaborators who provided helpful feedback and insights that guided my later
interpretations. I also conducted member checking by sharing my drafts with my participants and requested for their feedback via e-mail.

**Trustworthiness**

In qualitative study, Creswell (2003) stated that trustworthiness is used to determine “whether the findings are accurate from the standpoint of the researcher, the participant, or the readers of an account” (p. 196). Lincoln and Guba (1985) listed three criteria for trustworthiness, which are credibility, transferability, and confirmability. To promote the trustworthiness of this study, several strategies have been utilized. The primary strategy utilized is the provision of rich, thick, detailed descriptions of the research methods, analysis process, and the participants’ experiences to provide “sufficient information about the context in which an inquiry is carried out so that anyone else interested in transferability has a base of information appropriate to the judgment” (Lincoln & Guba, 1985, p. 124). To facilitate the credibility of my findings, I triangulated different sources of data including the teacher candidates’ journal reflections, the interview data from the VS co-operating teacher and the university field placement director as well as my researcher’s journal to build a coherent justification for the themes. Furthermore, I conducted member checking by sharing my findings with the VS co-operating teacher and the university field placement director and systematically soliciting their feedback and confirmation to determine if my interpretations and conclusions were valid. Finally, to promote confirmability, I clarified my researcher’s bias under the next heading of “The Researcher and the Research Context.” I also relied on my researcher’s journal, which included my assumptions, biases, and insights throughout the study.

**The Researcher and the Research Context**

Jones (2002, p. 463) stated that researchers must “make known who they are in the context of the study under investigation and make explicit the ‘subjective I’ and that the researchers have to be cognizant of their own assumptions and be explicit about the influences that these assumptions have on the research since they are the “instrument” in the research design. In line with this recommendation, I will describe the different roles and responsibilities I play within this case study and the influences they may have on the study.
As a qualitative researcher, I entered this study with many personal experiences that would have influenced my interpretations of the data. In order to minimize my subjectivity, I have identified circumstances and the many intertwined roles that may have influenced my thoughts, and hopefully in so doing, understand why and how I have come to my interpretations. Reflexivity is crucial for this case study because the experiences that I have identified below have led me to many preconceived notions about the research context and expectations for the findings (Esterberg, 2002).

Firstly, I was a graduate research assistant who was financially funded by the TEGIVS project. My involvement in the project began in 2004 when the principal investigator hired me as the first research assistant for the project. By the time I conducted this study, I had been working on the project for three years. My experience with the project allowed me to acquire a great deal of knowledge as well as preconceived ideas pertaining to the area of VS. Moreover, my continual professional development as a TEGIVS collaborator and my interactions with others in the field through professional conferences also contributed to reinforcing some of my perceptions of VS. Some of those perceptions include my acceptance of VS as an effective format of education as long as sound learning theories are incorporated and technology is used as the vehicle rather than the content. In other words, I saw VS as a good format of education if technology is used effectively to enable the learning activities to occur.

Secondly, I was also a novice field experience supervisor. Since I was new to the role of field experience supervisor, I relied on the support of the principal investigator and another university field experience supervisor. I also conducted my role as a field experience supervisor based on my readings about the process. Although I was new to the role of a field experience supervisor, I was not new to the profession of teaching. I had received my teacher training and also taught in Malaysia, England and the United States. Additionally, I have also been awarded a teaching excellence award for my teaching at a Midwest university during my master’s program. All these experiences greatly influenced me in how I conducted my role as a field experience supervisor.

Thirdly, I noticed that my journal contained notes regarding the curriculum itself because I was also the curriculum developer. Because of my previous teaching experience, I
was familiar with the process of writing a curriculum. Also, I was familiar with a curriculum that involved technology as a tool because of my master’s thesis in which I used online chat tools to attempt to improve the willingness of international teaching assistants to communicate in English (see Compton, 2004a and 2004b).

Fourthly, I was a researcher who was given full authority to develop this aspect of the project for my own research. Again, my master’s thesis and prior research experience throughout my graduate studies helped me to be an experienced participant observer, so I was comfortable with the process of taking research notes and conducting effective observations. I identified myself as a participant observer to the participants at the start of the course, but they saw me primarily as their field experience supervisor. This made it easier for them to accept my presence during their synchronized activities. However, because I was personally vested in this particular case study, I needed to be acutely aware of my desire for a successful outcome and be cautious in my expectations for the analysis of emerging themes.

**The Impact of the Virtual Early Field Experience on the Teacher Candidates’ Responses to VS**

This virtual early experience had a positive impact on the teacher candidates. They started the course with preconceptions about online learning that were based on their previous experiences. Their preconceptions led to questions and concerns about how to be a teacher in an online environment. The analyses show that after they completed the virtual field experience they not only cleared up many misconceptions but also indicated an interest in teaching online in their future careers. Additionally, they recognized that technology is merely a vehicle for learning and that the learning process still needed to be facilitated by a VS teacher, though with the teacher playing some different roles than in a traditional classroom. The following subsections will describe these findings in further detail.

*Clarifying misconceptions, preconceptions, and concerns*

The virtual early field experience course was divided into learning modules, which included reading, observation and reflective activities. The first four learning modules in V2 were similar to the first four learning modules in V1. In the early learning modules (Modules 1-3), the course focused on introducing the participants to the concept of VS through reading
reports and documents pertaining to topics such as the national vista of VS, online teaching skills, misconceptions, responsibilities of a VS teacher, and legislative issues. Additionally, these early modules required participants to read about participants of VS from the perspective of the VS student, VS teacher and site coordinator from the Virtual High School website (See “Day in the Life” at http://www.govhs.org/Pages/Welcome-Home). In addition, an extra article on VS that was research-based was also assigned in Module 4 because V1 was a graduate level course.

By Module 2, access to the VS teacher’s high school anatomy and physiology course was also provided for lurking purposes. Here, “lurking” is defined as virtually navigating in the VS course environment without active participation in the course itself. In other words, participants navigate as invisible participants in the VS course and do not post any comments or contribute anything to the discussion boards or learning materials in the observed VS course. The university supervisor coordinated with a VS teacher of Anatomy and Physiology from ILO (www.iowalearningonline.org) to gain access to her ILO WebCT course for lurking privileges. Individual access and password was provided as teaching assistants to allow observation at both the VS student and VS teacher levels. Participants were assigned an open lurking task where they navigated freely throughout the course and made notes of general observations. In the following module (Module 3), however, participants were assigned a focused lurking task in which they had to pay attention to specific details such as pedagogy, technology, and assessment. The lurking activities allowed the participants to observe how the high school course was organized in terms of the individual reading assignments and kitchen labs, the threaded online discussions, quizzes, and tests. They could also observe each individual unit to see how existing internet resources were carefully selected to complement tasks designed by the VS teacher.

They also participated in two synchronous activities that allowed them to have a conversation with a VS teacher and observe her conducting virtual office hours. The first synchronized meeting scheduled in Module 3 allowed the VS teacher to meet the participants virtually either using Skype or the Iowa Communication Network (ICN) (http://www.icn.state.ia.us/), a two-way interactive audio-video system with studio classrooms at schools in all Iowa school districts. This session allowed the VS teacher to
meet with the participants and explain how the course was set up. The VS teacher also took
the opportunity to address any questions and concerns. Meanwhile, the second synchronized
activity was a live observation of two to three 45-minute virtual office hour sessions via ICN
in Module 4. Participants were required to meet with the university supervisor on campus in
one of the university’s ICN rooms. Because the university’s ICN room had to be added as a
remote site, arrangements were made with the VS teacher ahead of time. During the
observation, the participants used Skype as a back channel communication tool to ask
questions, which were addressed by the VS teacher when her students were working on their
units. Additional 15 minutes were added to the last session for a debriefing session between
the participants and the VS teacher.

The combination of different activities helped to clarify all three teacher candidates’
misconceptions and preconceptions, and addressed some of their concerns about VS as
indicated in their reflections:

At first I believed that virtual schooling could only be used for certain classes and
was worried about the teacher/student communication as well as the cost of virtual
schooling. A lot of the concerns that I believed about virtual schooling turned out to
be myths. And the myths came from just not having the right knowledge about virtual
schooling. (Teacher candidate Helen, summative report)

Through the readings I have minimized my own fears and anxieties about VS. It was
amazing to see the statistics about how children are learning through VS. I liked to
learn as well that VS helps kids who cannot have an actual teacher in their school due
to budget or just a shortage in teachers. (Teacher candidate Mary, summative report)

When I came to this field experience I was expecting to go through something similar
to the distance education that I had been exposed to. I really don’t think I could have
been more wrong about what virtual schooling (VS) was. I experienced very little that
I expected during this experience….Reading about VS could have in no way
completely prepared me for the real experiences that I was able to go through by
doing this field experience. (Teacher candidate Robin, summative report)

**Changing personal learning goals and increasing interest in VS**

Weekly reflective journals were included as part of the teacher candidates’
assignments to encourage reflective practices and critical analysis of VS. These reflections
included their thoughts after completing the readings, lurking, virtual and on-site
observations as well as practice grading. Additionally, the teacher candidates were required
to submit a summative report as part of their final learning module assignment. Participants
were required to report on what they had learned about VS, the challenges they faced during
this experience with VS, and any changes in their perception about VS after reviewing all their weekly journals. Their journal entries and summative reports showed that they were more positive towards the idea of VS and were eager to learn more about it. They also expressed interest in pursuing a career related to VS as a teacher. For teacher candidates Mary and Helen, their original intention in participating in this pilot virtual field experience was to acquire the necessary observation hours for their course. However, their personal learning goals soon changed as they began to realize the potential of VS as noted in their reflections:

I am excited to be a teacher and like to widen my knowledge about the field as much as possible. (Teacher candidate Mary, reflection 1)
I at first was in the class just because I needed to finish my hours for CI 280. Now that I have experienced VS first hand, and see the other side of it, I definitely think it would further my career to be a VS teacher. I would love to work in the classroom as well, but I love the strong role technology plays in VS. I think it would be a challenge to create a course that is good for VS and would like to see and improve on what is already out there. My perception about virtual schooling is changed because I think at first what I had in mind was that it was far away from happening, and everything that was said bad about it. I now know it is such a good thing, and not necessarily better, "just different". …I am very excited to get to know more about virtual schooling. (Teacher candidate Mary, summative report)

When I first signed up for the course I was just worried about getting my required hours in for CI280. I didn’t know much about Virtual Schooling in fact I knew very little about virtual schooling. I am now really glad that I signed up for the course and have changed a lot of my own personal beliefs and values from the time I first began to now. …I feel that VS will be around for a very long time and that people should become aware of what it exactly is.(Teacher candidate Heather, summative report)

Besides reflective journals and summative reports, V1 also included an additional assignment in Module 5 that required teacher candidate Robin to travel to a school for an on-site visit to observe a regional laboratory and interact with VS students and VS site facilitators to learn about their experiences and responsibilities. The VS teacher included quarterly regional labs as part of her online course to ensure that students received hands-on experience. Therefore, she arranged regional labs in a few locations to allow students from nearby sites to attend. Robin scheduled her observation at the nearest location. Since her content area was not science, she was not expected to focus on the experiments. Instead, she was encouraged to talk to the students and the VS site facilitators to get a better understanding of their experiences and responsibilities in VS. Robin was the only participant
who had the opportunity to observe a regional lab at a nearby high school. Because V2 did not include this task due to time limitation, Mary and Helen were not required to observe the regional lab even though an open invitation was provided. Although both of them expressed interest and enthusiasm, they were unable to attend a regional lab due to their busy schedules.

The regional lab provided an additional perspective and opportunity for Robin to interact with the VS students and VS facilitator. These interactions helped to improve her understanding about how VS works and especially about the role of the student coach. She later expressed an interest in a career as a student coach as she noted in her reflection, “I think I would enjoy being a student coach for a VS course sometime” (Teacher candidate Robin, reflection 4).

**Understanding of key VS teaching skills and teacher’s role**

At the end of the field experience, all three teacher candidates were able to identify key teaching skills required for a VS course. Some of the main skills included effective facilitation, organization and management, providing clear instructions and ensuring clarity throughout the course, and multi-tasking:

The skills that I feel are most important when conducting a smooth office hour include certain aspects such as being able to multi-task, and organization. Throughout the office hour we were able to observe the teacher doing multiple activities such as talking to the students and asking them questions or answering their questions as well as typing to us answering our questions or letting us know important aspects of the office hour, also keeping an eye on all of her schools that were present during the office hour. (Teacher candidate Helen, reflection 4)

She manages so much at one time with so many different students….Everything was so clear…Each direction is clear and concise and leaves no room for the incorrect interpretation on the student’s end. (Teacher candidate Mary, reflection 5)

Even though I know this lab took a lot of time to prepare, Mrs. Wortmann makes it seem effortless. (Teacher candidate Robin, reflection 4)

The teacher candidates also realized that the VS teacher’s roles were as learning facilitator and manager while the students had to be extremely responsible for their own learning:

The main characters in VS are the students. …they have to be independent, organized, and driven…She (Mrs. Wortmann) told me that it would be an authentic experience for them when they realized that they did not plan accordingly for the lab. This was really the first time I completely understood the independence that these students are given and required to handle. I understood another side of the virtual
sarking teacher’s job in that they don’t always guide at every second in this type of course. (Teacher candidate Robin, reflection 3)
The students have a lot of responsibility on their own…(Teacher candidate Mary, reflection 5)

Understanding the supportive role of technology

The use of different technologies in this pilot field experience helped the teacher candidates to understand that technology plays an important role in VS, especially in making the virtual aspect of VS less noticeable. For example, after viewing a recorded demonstration of an online math tutoring session, teacher candidate Helen was amazed that the use of technology made the session look “exactly like [her] tutoring sessions when [she] was in Math 150 freshman year, except this was through the computer.” She also noted that the use of Skype, an audio-video conferencing tool, helped make the communication more natural because they “were able to view her talking to [them] live, or chat with her like [they] were on the telephone.” Besides Skype, she also pointed out the use of the ICN audio-visual technology allowed the teacher to “show the students a variety of additional visual aspects such as pointing out where the muscles are located just as if you were in a traditional classroom atmosphere.”

Additionally, they noticed that the technologies used in the VS course provided flexibility. For example, teacher candidate Mary wrote in her reflection that the use of Skype allowed scheduling flexibility for a conference call between the cooperating teacher and a student who was spending a semester abroad, “There was a 6 hour time difference, which actually worked out well because when the student got home from regular school it was just about lunch time here in Iowa.” She added that VS teachers have much more flexibility with their schedule because technology is readily available even if teachers need to go out of town and therefore there is no need for substitute teachers. Teacher candidate Helen also noted that the technology used in VS allowed “students and teachers to work at their own pace as well as their own time.”

The teacher candidates were also excited to discover how technology provides educational access and opportunities to students who otherwise would be left out:

I liked to learn as well that VS helps kids who cannot have an actual teacher in their school due to budget or just a shortage in teachers. I am glad we are using technology
to reach out to these children and they are not missing out on their education. (Teacher candidate Mary, summative reflection) [VS] also has the ability to reach children that are unable to make it to the traditional classroom setting, which helps them stay caught up in their current grade level. It also provides students with the opportunity to take additional courses that may not be offered by their own school. VS provides students with a variety of opportunities such as taking courses that are interesting to them, as well as broadening their insights and knowledge of different cultures and people since the students in the class are located all over the world sometimes. (Teacher candidate Helen, summative reflection)

In summary, the rich qualitative evidence showed that the virtual early field experience had positive impact on the teacher candidates and helped them to clarify the myths and realities of VS, the skills of a VS teacher, and the role of technology in VS. The increase in awareness about VS also spurred an increase in interest in future careers related to VS.

**Key Elements for a Successful Early Field Experience of VS**

This early virtual field experience was created as a pilot project to help create a more suitable form of field experience aimed at helping teacher candidates gain a better understanding of VS. When I created the curriculum, I researched the purposes of field experience through relevant publications (e.g. Murray, 1996; Sikula, Buttery, & Guyton, 1996) and existing practices of traditional field experiences. I also referred to the NEA (n.d.) for their recommendations of what a VS field experience should look like. I then identified some key elements and incorporated them into this pilot field experience. Through in-depth analysis of the data, I have discovered five main elements that were crucial to the success of this experience. To be reflexive, I have also listed some challenges and suggestions.

*Putting the “virtual” in the virtual early field experience*

Huling (1998, p. 2) stated that field experiences allow “teacher candidates [to] observe and work with real students, teachers, and curriculum in natural settings.” It is necessary, therefore, to offer early field experience in VS in a fashion that will mirror the “natural settings,” which in this case was a virtual setting. Teacher candidates participated in activities in the same manner that the VS students conducted their learning activities, e.g. online readings, instructions, and tasks, off-line reflections, and virtual office hours. In this pilot case study, the teacher candidates obtained their online readings, instructions, and tasks
through the university’s WebCT system, which is the same system used in the VS course. This allowed the teacher candidates to gain similar experiences to those of the VS students in the course they were observing. Moreover, taking this field experience virtually would provide teacher candidates with at least one online experience as advocated by the NEA (n.d.).

The synchronized observation of the virtual office hours was very crucial to the teacher candidates’ understanding of how VS operated in this particular case. Teacher candidate Helen called it a “huge eye opener and great experience,” while teacher candidate Robin noted that “it was more exciting than [she had] expected.” Even though the asynchronous lurking activities provided teacher candidates the flexibility and freedom to explore the VS course, they did not provide the teacher candidates with the full picture, particularly with student-teacher interactions. The synchronous mode of observation had a big impact on the process of internalizing:

The virtual office hour was a success! The teacher candidates had a live observation of how the VS teacher interacted with her students synchronously through ICN. They had a chance to see an example of the teacher addressing students’ concerns and progress, a demonstration of a concept, a student presentation, and the provision of instruction for future lessons. The teacher candidates commented after the experience that they finally understood the set-up. I think a light-bulb just came on. If this had just been a viewing of a recording, I don’t think the impact would have been as strong. Because they were participating in the experience, they were able to comprehend how the ICN works in supporting the teacher-student interactions. They themselves were part of the virtual office hour as “passive students.” (Field experience supervisor, personal journal)

The NEA (n.d.) stressed the importance of providing online “student teaching” experiences to give teacher candidates the “experience with and research into different delivery platforms” (p. 13). Likewise, Mrs. Wortmann also thought that it was important for teacher candidates to understand the mechanics of the course management systems:

Pre-service teachers need to first understand the teaching end of the course framework systems (WebCT, Blackboard, Moodle, etc.). The mechanics are the first step. Knowing how those mechanics work behind the scenes opens up creative uses of the tools and best practices for teaching virtually. (Mrs. Wortmann, interview)

Mrs. Wortmann provided each teacher candidate her own login ID and password and listed them as teaching assistants so they could see not only the student pages but also the teaching
tools. The lurking activities allowed them to observe how the high school course was organized, such as the individual reading assignments and kitchen labs, the threaded online discussions, quizzes, and tests. They could also observe each individual unit to see how existing internet resources were carefully selected to complement tasks designed by Mrs. Wortmann.

There were challenges in making the virtual connections. The first challenge was scheduling. Because the virtual office hours were scheduled at specific days and times weekly, the field experience supervisor had to find virtual office hours that would fit the teacher candidates’ busy schedule of classes and in-school observations. Also, the field experience supervisor had to ensure that the ICN room on the university campus was available for the selected dates and times. The second challenge was funding. In this particular case study, the payment for the use of the ICN room was funded by the TEGIVS project. Funding for future experiences needs to be addressed before more virtual field experiences can be scheduled.

Besides these challenges, the field experience supervisor noted some concerns for future experiences. In this particular case study, the teacher candidates observed two virtual office hours, which were scheduled back to back and lasted 45 minutes each. Although the observation proved to be very fruitful in this case, the field supervisor noted that it may not always be the case as noted in her journal:

We were very lucky that the two virtual office hours yielded rich input. Mrs. Wortmann had informed me that not all virtual office hours are as productive. Sometimes students don’t show up because they are only required to show up once out of two weekly meetings. Other times the students show up for 5 minutes and leave if they have no questions. If that had happened, the pre-service teachers would end up observing very little. How can we ensure that pre-service teachers will observe what they need to observe? (Field experience supervisor, personal journal)

According to Gayle, Iowa requires student teachers to complete at least 80 hours of observation before they proceed to student teaching. She added that some programs require up to 100 hours of observation. If teacher education programs were to include virtual field experiences as part of the 80 hours of observation, they could easily schedule more than one live observation so the teacher candidates could have more opportunities to observe how VS works.
Another concern is about the availability of good examples of VS and VS cooperating teachers. As noted in my research journal, getting access to good examples of VS was extremely challenging:

We have tried for several months to identify a few good models of VS in different subject areas. Unfortunately, we have not been able to enlist the help of the VS teachers or institutions beyond the state of Iowa for our pilot virtual field experience due to time constraints and other circumstances. We are extremely fortunate to have Mrs. Wortmann and access to her award-winning course, but I would really prefer to have access to a range of courses, not just science or at the high school level. I think that it would be more meaningful if the teacher candidates can observe examples of VS as close to their area of study as possible. But we have also seen a lot of bad examples in our search that we want to stay away from (Researcher journal).

As the university director of field experience, Gayle emphasized the importance of field experience and strongly asserted that “it is a critical part of [the teacher candidates’] training of what it’s like to be a practicing professional…. It is the once chance that the students have to see the methods that they are being taught and the pedagogy in their classroom and put a practical application to those” (Gayle, interview). She added that one of the goals of field experiences is to “expose our students to a range of locales, diverse populations, and a range of philosophies among districts and curricula, and that should include the idea of online learning, teaching, and observation” (follow-up interview). While she felt that field experience should incorporate virtual field experiences, she was also concerned that there were not sufficient good models of VS with effective VS cooperating teachers available for teacher candidates to observe and work with, and she warned that unfocused observations can be harmful. This case study was based on the teacher candidates’ experiences with an exemplary VS teacher and her award winning Anatomy and Physiology course. It is unnecessary for all teacher candidates to observe award winning courses, but undoubtedly, they should be exposed to good models of VS and work with VS teachers who can provide excellent mentorship in this area.

*Increasing awareness through external and internal information gathering*

Knowles and Cole (1998) indicated that teacher candidates enter teacher preparation programs with personal histories that influence their preconceptions about education. However, preconceptions that “are at odds with realities presented in the field” can lead to difficulties (p. 654). Therefore, it is necessary to address any preconceived notions or
misconceptions that teacher candidates have regarding VS and help them increase their knowledge through multiple resources. Knowles and Cole recommended two methods of exploring field experience through inquiry: 1) gathering external information, and 2) gathering internal information.

Knowles and Cole (1996) listed artifactual information and observation as two ways of gathering external information. In this pilot case study, artifactual information was provided to the teacher candidates rather than requiring them to conduct their own search. In line with the recommendations by the NEA (n.d.) for online student teaching experiences, the artifactual information included the carefully selected readings that addressed misconceptions and myths, and research on effective VS in the early modules. In addition to these readings, the later learning modules (i.e. Modules 8 and 9 in V1 and Modules 4 and 5 in V2) provided selected list of web links to recorded demonstrations by established VS institutions that illustrated a range of technologies and VS courses in various content areas and grade levels. The artifactual information proved to be effective in addressing some of the teacher candidates’ misconceptions and preconceptions. For instance, teacher candidate Helen thought that only certain courses could be offered through VS.

Before reading the NACOL website, I was very picky on what I thought would make good online courses and what wouldn’t make good online courses. Here are examples of what I believed….Bad: Science, health, and any course that I believed required hands on activities. I didn’t believe that you could teach courses like this without hands on activities. However I have found that there are many activities that you can do that creates a great learning environment as well as ways of altering the course to make certain courses work online” (Teacher candidate Helen, reflection 3)

On the other hand, teacher candidate Mary believed that only high school courses could be offered through VS. After exploring some of the recorded demos, she noted that “it was cool to see how each grade level can use virtual schooling” and that “virtual schooling is a great opportunity for children from kindergarten to the high schools” (Teacher candidate Mary, reflection 2). She was also surprised to find out that the cost involved in VS was more expensive than traditional classroom settings and thought it would be a “wonderful alternative for districts” (reflection 2).

Of course, readings and recorded demos alone cannot provide the full picture of how VS works. The use of observation through asynchronized (lurking) and synchronized (virtual
meeting with VS teacher and live observation of virtual office hours) activities were included to allow the teacher candidates to experience VS personally. In V1, additional activities included on-site visit during a regional lab and facilitation and grading of a group discussion. The careful blend of the different activities was necessary to facilitate the experiential learning of the teacher candidates. As indicated by teacher candidate Robin in her summative report, reading alone would have not sufficed in helping her learn about VS:

> Reading about VS could have in no way completely prepared me for the real experiences that I was able to go through by doing this field experience. I am the kind of person who will try to read about an experience and get the information that I need, as I rarely have time to go experience it for myself. I have tried to find readings, both in the class and out that I could say would prepare someone for this experience but so far there isn’t one or a combination [of readings] that can replace the experiences that I had this semester. (Teacher candidate Robin, summative report)

Besides external information gathering, Knowles and Cole (1996) also recommended internal ways of information gathering such as reflective and summative journals. The use of these reflective journals helped the teacher candidates to analyze what they had experienced and to make sense of the experience for their professional growth (Rudney & Guillaume, 1989-1990). The limited number of field experience credit hours in this case study restricted the type of tasks that could be included. Future virtual field experiences should include more attention to the personal histories of the teacher candidates especially at the beginning of their field experience. This can be facilitated through a thorough reflection or journal of their past educational experiences and the expectations about VS that they have developed based on those personal histories. Besides that, future virtual field experiences should also include other methods of external information gathering. For example, teacher candidates can gather their own artifactual information or interview the VS teacher, site facilitator and/or VS student so that they can make better connections between their observation and their personal history.

**Including guided observations**

Observation alone is insufficient for effective learning. Huling (1998) reported that “careful guidance and mediation to help candidates focus on critical aspects of classroom teaching and interactions and to interpret what they see are necessary for candidates to benefit from field experiences” (p. 3). Therefore, in addition to the general lurking activities,
the university supervisor and VS teacher also negotiated guided observations, which were essential for the later learning modules. An early virtual meeting was arranged as an introductory session for the teacher candidates to meet with the VS teacher. In the V1 version, the meeting was mediated by the ICN while in the V2 version, Skype was used. Both instances required the teacher candidates to meet with their university supervisor on the ISU campus before meeting with the VS teacher. In V1, the VS teacher had full control of the camera, but the teacher candidate could speak at anytime by pressing the microphone button. In V2, the virtual meeting began with introductions using a webcam on both ends. Later, the webcam was replaced with voice chat to reduce technical difficulties. The VS teacher was able to provide a guided tour of the course and address questions from the teacher candidates.

Guidance was also provided during the virtual office hour observation. During the synchronized observation, the teacher candidates used Skype’s text messaging as an unobtrusive back channel communication tool to ask questions, which were addressed by the VS teacher when her students were working on their units. This allowed them to ask questions as they arose, and the VS teacher was able to provide almost immediate feedback. Because text messaging was used, the VS students were not aware of the communication between the VS teacher and the teacher candidates.

Debriefing following any observation is an important element in a field experience (Huling, 1998). Mrs. Wortmann also believed that the teacher candidates “should reflect on the experience and have a debriefing conference with the cooperating online instructor [because] all teachers should be reflective practitioners” (Mrs. Wortmann, interview). She continued,

At the end of each lesson, I ask myself the following questions: What did I want to have happen? Did it happen? If it didn’t happen, what can I do to make it happen? If it did happen, how can I make sure it happens again? In this way, the practitioner’s teaching repertoire grows and choices can be purposefully made to attain lesson objectives in the future (Mrs. Wortmann, follow-up interview).

Likewise, the university field experience director also believed that debriefing the observation was critical in helping the teacher candidates understand “the planning of the lesson both from a curriculum and a delivery standpoint, the assessment of the lesson, and
the accomplishment of student learning [as well as] how the lesson relates to the state’s standards and district benchmarks” (Gayle, follow-up interview). Therefore, an additional 15 minutes were added to the ICN virtual office session to allow for a debriefing between the VS teacher and the teacher candidates. Here, the VS teacher addressed in detail some of the questions that were raised and also provided information about other aspects of the course that were not observable during the virtual office hour. Because of my role as a research assistant on the TEGIVS project, I had insights into the VS course and used my knowledge to prompt the VS teacher by text messaging her through Skype and asking her to elaborate or talk about certain issues or aspects of her VS course and teaching practices.

For future virtual early field experiences, it is recommended that the VS teacher and teacher candidates have more debriefing opportunities. For example, a Skype session can be included weekly to allow teacher candidates to report what they have observed and ask any questions they might have. This experience would not only facilitate better understanding of VS but also allow the teacher candidates the experience of a VS learner attending a VS office hour.

*Providing guided hands-on experiential learning*

Huling (1998) reported that field experiences may include other responsibilities including supervising students and grading student work. In Modules 6 and 7 of V1, teacher candidate Robin was assigned to track a specific group of students. Since the VS course was set up to be flexible and self-paced to a certain extent, tracking a specific group of students allowed her to follow the students’ progress more closely and gain a better understanding of these students’ learning situations, including their schedules and conflicts at their own schools. Additionally, she was asked to follow a discussion thread for two weeks and facilitate when necessary. At the end of the two weeks, she had to grade the assigned students’ involvement in the discussion according to a rubric set by the VS teacher. These grades were then emailed to the VS teacher who took them into consideration when she actually graded them herself. V2, however, did not include the facilitation and grading tasks due to time limitation.

Mrs. Wortmann thought that this activity was an important piece of a field experience for teacher candidates to “lurk in an active class and facilitate a discussion if at all possible . . .
. [and] have a chance to grade that discussion” (Mrs. Wortmann, interview). She also stressed the importance of interactions between the teacher candidates and VS students during a field experience, and that a virtual field experience was no exception:

Observing is one way to learn how things are done, but actual practice with live students is better. The teacher of record can monitor the discussion and grading to make sure it is within the acceptable parameters of the course. Because the lurking and interactivity are online, schedules and distances do not preclude a pre-service teacher from participating. It is a type of “field observation” for the pre-service teacher, but with some involvement to give the pre-server a better sense of online facilitation. In a face-to-face classroom, the lurker can observe body language and interaction. In order to do that online, one has to communicate directly with the students. (Mrs. Wortmann, follow-up interview).

Gayle also agreed that teacher candidates should eventually be given added responsibilities under the cooperating teacher’s supervision so they can practice in “baby steps”:

I think that for field experience in VS, they also need to practice in baby steps. It is a very appropriate place to start – you learn about the process and the need, you go in and observe, even though it is not face to face but it is using the type of classroom you will be using or working or lurking in as the case may be. If we are going to develop facilitators/teachers to work in a virtual classroom, then they also have to practice with that and see a professional model, the kinds of experiences that they will have…If we use our teacher education program as a model, then the logical next step would be that the next step the student facilitator would get practice teaching or facilitating a lesson, probably not taking on a whole curriculum. We save that for student teaching. (Gayle, interview).

Including on-site observations

Another important component of this field experience was an observation of a regional lab. The VS teacher included quarterly regional labs as part of her online course to ensure that students received hands-on experience. Therefore, she arranged regional labs in a few locations to allow the VS students from nearby sites to attend. In Module 5, V1 required the teacher candidate to travel to a school to observe the on-site regional laboratory and interact with VS students and VS site facilitators to learn about their experiences and responsibilities. Due to time constraints in V2, the teacher candidates did not have such opportunities. In this pilot study, teacher candidate Robin scheduled her observation at the nearest location. Because this was planned ahead of time, the VS teacher was able to ensure
that the VS students assigned to the teacher candidate for tracking would be at that location. This allowed teacher candidate Robin to meet with the VS students that she had tracked online:

> It was really fulfilling to meet face to face the students that I had been following. . . . I was able to watch, walk around, and ask questions without feeling awkward or like I was interrupting them. (Teacher candidate Robin, reflection 4)

Since teacher candidate Robin’s content area was not science, she was not expected to focus on the experiments. Instead, she was encouraged to talk to the students and the student coaches to get a better understanding of their experiences and responsibilities in VS. This task was beneficial in helping teacher candidate Robin explore the role of a student coach as she spent time with one of the student coaches and even encouraged her to consider a future career as a VS student coach.

> The VS role that I was least familiar with before today was the student coach. . . . I am really excited to have been able to spend this serious time with [the student coaches] to get a better feel for their tasks in this course. I was able to spend some one-to-one time with [one of the student coaches] and find out what her job as the student coach entailed. . . . Where her role becomes completely beneficial to the VS process is in keeping everything running smoothly. . . . If the coach finds out that a student is just not keeping up they will work with the student to get back on track by giving them some help in time management or even getting their parents involved. . . . I think I would enjoy being a student coach for a VS course sometime.” (Teacher candidate Robin, summative report)

Teacher candidates Mary and Helen did not have an opportunity to spend time with any VS students or their student coaches due to the shorter allotment of observation hours in V2. This lack of opportunity prevented them from getting a better understanding about the different roles and responsibilities, particularly those of a student coach. This lack of knowledge is reflected in teacher candidate Mary’s early reflection as she placed the responsibility of technology support on the VS teacher rather than the student coach:

> Each student taking a VS course would need to have access to a computer on a regular basis. Without this, the course is delayed significantly. The teacher may need to help their student find access to a computer, by setting up times at a local school for the student to go, or find a grant or government to help get the student a computer. (Teacher candidate Mary, reflection 1)
No other reflections by teacher candidates Mary and Helen made any reference to student coaches. They did note in their feedback about the course that it would be good to “add a bit more knowledge [and] a variety of viewpoints from the students and possibly the proctors behind the virtual school” (Teacher candidate Mary, feedback comment).

Gayle also stressed the importance of providing teacher candidates with different perspectives besides the VS teacher perspective. She agreed that the teacher candidates should visit different locations so they can experience VS from different angles:

> . . . add a student location and see it from that angle also. It would be an important developmental progression. A lot of our students have not necessarily experienced being a virtual student. And so until they have experienced all sides of that triad, the observer, the teacher and the student, they won’t have a full understanding of the intricacies of planning, or the implications and how you can be accountable for student learning at a distance. Accountability is extremely important these days (Gayle, interview).

In summary, there were five main elements that contributed to the success of this pilot virtual field experience and were important in helping the teacher candidates gain a better understanding of VS. The first and most important element was to offer the field experience via virtual technologies rather than traditional student placement in a brick-and-mortar environment, since a traditional classroom cannot show the first-hand realities of virtual teaching. Secondly, providing access to relevant information plus opportunities for critical reflection helped to facilitate the teacher candidates’ awareness of VS. It was also necessary to provide guidance during live observation to help the teacher candidates focus on certain aspects of VS. This was accomplished using Skype text messaging as back-channel communication and debriefing. Another important element crucial to the field experience was the opportunity to practice facilitating and grading an online discussion. The teacher candidate that had hands-on experience gained a better understanding of what it takes to moderate and facilitate an online discussion. Lastly, it was also very useful to include the on-site observation because it exposed the teacher candidate to additional perspectives that were missing in the virtual observations alone.
From Case Study Back to Theory

In this case study, two complementary frameworks, experiential learning framework (Knowles & Cole, 1996) and constructivist approach to teacher preparation (McIntyre, et al., 1996), were used to guide the data analysis. This section addresses the key ideas from these frameworks and uses them to clarify the themes that emerged from the data analysis.

As shown earlier in Figure 4.1(a), the experiential learning framework of one cycle of field experience is divided into four parts: personal experience and practice; information gathering and documentation; reflection, analysis, and formulation of personal theories; and informed action. The findings showed that the virtual early field experience allowed the teacher candidates to complete one cycle of experiential learning with positive results. During this cycle of experiential learning, teacher candidates were encouraged to formulate their own ideas about VS through critical reflection and analysis as advocated by the constructivist teacher preparation framework.

Personal Experience and Practice

The first part of the experiential learning cycle emphasizes the importance of personal history. Knowles and Cole (1996) listed several studies that have shown how teacher candidates’ past experiences with a wide range of teaching and learning situations and contexts influence their preconceptions of education. These preconceptions that are commonly at odds with reality can often lead to conflicts in their careers as teacher candidates. The findings in this study show that personal history plays a big role in the teacher candidates’ perceptions of VS. Because they all had some form of experience with online or distance education courses, they had misconceptions and preconceptions that resulted in concerns about VS. It is necessary, therefore, to address these inaccurate ideas and to help the teacher candidates modify their preconceptions by allowing them to go through the field experience virtually and placing them with an exemplary VS teacher with whom they can observe good practice. After all, Dewey (1938) reminds us that “It is not enough to insist upon the necessity of experience, nor even of activity in experience. Everything depends on the quality of the experience which is had. The quality of the experience has two aspects. There is an immediate agreeableness or disagreeableness, and there is its influence upon later experiences” (p. 27). The primary influence on the quality of the virtual field
experience was the virtual context in which the field experience took place. And the placement with an exemplary VS teacher also enhanced the quality of the experience by providing a model on which future actions can be based.

Besides personal history with online or distance education, McIntyre, et al. (1996) added that the teacher candidates’ past 13 years of public or private schooling experience can make them “familiar with a school’s classrooms and routines, and therefore, with the context of the field experience placement” but warned that this familiarity could be a barrier to professional growth during field experiences (p. 173). Armaline and Hoover (1989) also stated that such a familiarity with a certain context can mask their potential vision of alternatives. The findings showed that the teacher candidates were less familiar with VS compared to the traditional format of schooling that they had experienced as students, resulting in preconceived ideas about VS, ranging from what courses were not possible with VS to the traditional roles of a teacher. If they had been restricted to only a field experience in a traditional school setting, they would be unlikely to modify their preconceptions about VS. However, because they were given the opportunity to experience a different type of field experience, they were able to conclude that VS was not better or worse than traditional schooling but that it was just an alternative format of education that was becoming prominent in the 21st century.

In the state of Iowa, teacher candidates are required to accumulate 80 hours of field experiences. Teacher education programs have begun to go beyond the common format of limiting field experiences to one school, one classroom and one teacher (McIntyre, et al., 1996). However, with the rising popularity of VS as an alternative, teacher education programs in Iowa and beyond should begin to consider offering field experience not only in a variety of settings, as advocated by McIntyre and his colleagues, but also in different modes, such as a virtual field experience, so teacher candidates are exposed to different contexts and alternatives of education through their extensive field experiences. Knowles and Cole (1996) agreed, stating that professional development can be enhanced by the possibilities afforded by different contexts. Even though they made the statement in reference to non-formal school settings, such as tutoring and remedial centers, community recreation centers, etc., it is safe to assume that in the 21st century, a virtual classroom qualifies as an alternative placement
that teacher education programs of the 21st century cannot ignore. It is cautioned, however, that teacher education programs should have good teacher educators that can provide a holistic look at VS (including the pros and cons) and field experience supervisors can provide good models of VS for their teacher candidates to observe.

Information gathering and documentation

The second part of the experiential learning cycle stresses the importance of information gathering and documentation to help teacher candidates acquire the necessary information they need for reflection and analysis. As described earlier, Knowles and Cole (1996) proposed two primary methods of field experience inquiry: 1) gathering external information through observing real practices and collecting artifactual information, and 2) gathering internal information through reflections. The first method, gathering external information, is relevant for this stage of the learning cycle.

The findings show that the external information that the teacher candidates received through the selected readings and demos, as well as the carefully structured synchronized observations, helped greatly in enhancing their understanding of VS. Because teacher candidates have limited ability to help them make sense of their experiences (Hudson, Bergin, & Chayst, 1993), it was necessary to structure the information gathering process so the teacher candidates could be carefully guided in their learning. Moreover, the short time frame for the virtual field experience limited the amount of time the teacher candidates had to gather reliable and useful information that could facilitate their understanding of VS. By providing them with a series of carefully selected artifactual information, the teacher candidates were able to invest more time in processing the information rather than spending their time and energy sifting through large quantities of information that may or may not prove to be beneficial. Similarly, observation tasks were presented with guiding questions in order to highlight important elements that help the teacher candidates focus their observations. This scaffold was important since the teacher candidates had little or no teaching experience, which limited them in their knowledge of “what to look for or how to interpret what they see in the classroom” (McIntyre, et al., 1996, p. 175).
Reflection, analysis, and formation of personal theories

The third part of the experience learning cycle focuses on reflection and analysis, and the use of these reflections and analyses to formulate personal theories. Reflective practices are also in line with the constructivist approach to teacher preparation to develop reflective teachers. (McIntyre, et al., 1996; Pinar, 1989; Valli, 1992). Knowles and Cole’s (1996) second method of field experience inquiry, gathering internal information through reflection, is relevant for this stage of the learning cycle.

In addition to the information from external methods, such as observations and artifactual information, the internal method of information gathering through reflection allowed the teacher candidates to address their personal beliefs and attitudes towards VS and to make meaning of their field experiences. For instance, the teacher candidates reported that they had misconceptions about VS, but reacted differently after the readings and observations helped to clarify some of the myths and inaccurate preconceptions. Their reflections showed some evidence of analysis, such as the comparison between their own prior experiences and what was observed and the addressing of their attitudes and expectations prior to and after the virtual field experience. These critical analyses were used to form new personal theories about VS, such as the conclusion that VS was not better but just different and that technology was not driving the learning but just making the virtual element in VS less noticeable. However, more emphasis could have been placed on making explicit examinations of personal histories and preconceptions (Knowles & Cole, 1996) so the teacher candidates could clearly see how their attitudes and past experiences influenced their perception of VS and why they were inaccurate.

Informed action

The fourth and final stage in the experiential learning cycle, informed action, utilizes the results from the first three stages (Knowles & Cole, 1996). According to Kagan (1992), this stage requires the “developing awareness of initial and changing knowledge and beliefs about pupils and classrooms, a reconstruction of idealized and inaccurate images of students and a reconstruction of early images of ‘self as a teacher’” as important components of teacher development (p. 164).
In line with the constructivist framework, teacher candidates are encouraged to develop their knowledge via a reflective process following their experiences (Chiang, 2007). Chiang’s study showed that the teacher candidates’ reflective process during their early field experiences helped them to “understand their personal beliefs, enhance their personal growth, and clarify their career goals” (p. 1282). Likewise, in this case study, the teacher candidates identified their personal beliefs and used their newly gathered experiences to address the discrepancies between their perceptions and realities. The process of reflection pushed them to critically analyze the possible reasons for the discrepancies, resulting in their professional development. Based on their conclusions, the teacher candidates formulated new personal theories regarding VS that subsequently led to positive informed actions, ranging from expressing an interest in pursuing a career related to VS to printing out the selected readings for future reference.

In summary, the four stages of this experiential learning cycle helped the teacher candidates increase their knowledge of VS. However, one cycle is insufficient to produce teachers capable of VS teaching. It does, however, provide a foundation for their professional development related to VS. More cycles in similar fashion, but with more complex learning activities, are required to provide teacher candidates with growth in their professional development as illustrated in Figure 4.1(b)’s upward spiral and cyclical framework.

**Conclusion**

Overall, the rich and thick descriptions showed that this pilot study had positive impact on the teacher candidates. The completion of one cycle of experiential learning helped them gain a better understanding of VS, the key VS teaching skills, the VS teacher’s responsibilities, and the role of technology in VS. It also helped the teacher candidates to address their preconceptions and misconceptions, which minimized their concerns about VS. What began with a motivation to acquire the required contact field experience hours ended with spurred interest in a potential career related to VS.

This case study also examined five key elements that were seen as contributive to the success of this pilot virtual field experience. Firstly, offering the field experience virtually not only allowed the teacher candidates to observe the teaching in its real context, it also
provided them with an online experience, which the NEA (n.d.) deemed as important for teacher preparation of the 21st century. Secondly, the inclusion of external and internal methods of information gathering helped to facilitate the teacher candidates’ inquiry of VS, resulting in increased awareness and professional growth. The third and fourth elements stressed the importance of providing a range of learning activities that are self-paced, guided or structured, and hands-on so teacher candidates could focus on critical aspects of VS and interpret their observations accordingly. Lastly, the inclusion of an on-site observation was seen as necessary to provide a more complete overview of different complementary roles played by the VS site facilitator and the VS student in addition to those played by the VS teacher.

In addition to these five key elements, challenges and suggestions were provided to improve future offerings of this virtual field experience. Two key challenges were the difficulties in scheduling and the limited allotted field experience credit hours. Because some activities had to be conducted synchronously, the teacher candidates had to find slots of time amidst their regular weekly activities to coincide with the VS teacher’s schedule, which proved to be a tricky task. Furthermore, funding was important to pay for the ICN room for observation purposes. Also, due to the limited number of hours allotted for this virtual field experience, the teacher candidates were only able to complete a minimal number of learning activities, particularly in V2, which did not allow the teacher candidates the opportunity for an on-site visit. This on-site visit proved to be a valuable opportunity to expose teacher candidates to other people in the VS community. Naturally, two suggestions to overcome these challenges are to ensure adequate funding and more contact hours so teacher candidates could receive adequate learning opportunities.

This case study highlights the need to provide more virtual field experiences so teacher candidates can get a better understanding of VS and of the skills that are needed to be effective 21st teachers. This study needs to be replicated with teacher candidates who are training to teach in different subject areas and grade levels. In addition, future studies should also examine the experiences of teacher candidates who are provided with opportunities to observe VS from three perspectives, (i.e. the VS teacher, VS site facilitator, and VS student) as well as opportunities to observe and experience different delivery platforms. Lastly,
researchers should also consider investigating the impact of including different task assignments, such as online facilitation, grading, and course design and delivery in a virtual field experience.

References


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## APPENDIX 1: SUMMARY OF THE TWO VERSIONS OF THE VS FIELD EXPERIENCE COURSE

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<td>Readings, focused lurking, virtual introductory meeting, reflection</td>
<td>Readings, focused lurking, virtual introductory meeting, reflection</td>
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<td></td>
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APPENDIX 2: LEARNING MODULES FOR EARLY VIRTUAL SCHOOLING FIELD EXPERIENCE (VERSION 1 – UNDERGRADUATE LEVEL)

(Note: This short version was offered as a 10-hour observation of Virtual Schooling at the undergraduate level. It consists of 5 learning modules and 1 summarizing report. To download, go to http://ctlt.iastate.edu/~tegivs/TEGIVS/Field_Experience/Virtual_early_field_experience/Shortversion.doc)

Learning Module 1
Welcome to CI 280 Virtual School Field Experience. Before you proceed further with the course, please download the CI 280 Activity Log. You will need to keep a log of all your time spent on activities relating to this course. Next, complete the survey on virtual schooling. You will NOT see a button to select CI 280, so just select Section 1 for this time. We will indicate that it is for CI 280 in general.

In this first module please get familiarized with what virtual schooling (VS) is about. To do so, I have listed the two resources in your learning module. Please read the NEA Guide to Teaching Online Courses and the VHS "Day in the Life" to get a general idea.

Once you have done that, go to your respective blogs and reflect on the following:

1. In your opinion...What are some of the characteristics a VS teacher should have?
2. In your opinion...What is the role(s) of an effective teacher? Does it change with VS?
3. What role does technology play in the responsibilities of a VS teacher?
4. At this point, what are your thoughts or concerns about VS?

Web Links
NEA Guide to Teaching Online Courses
Virtual High School “Day in the Life”
hhttp://www.govhs.org/Pages/Welcome-Home

Learning Module 2

1. Read the NACOL article (pp. 1-19) to get an idea of common misconceptions and responsibilities of an online teacher.
2. Go to Iowa Learning Online's WebCT and log in with your ID and password. You should be able to find your ID and password from the CI280 Syllabus. If you have problems with access, contact your supervisor. Lurk in the current unit to observe what students are doing and how the unit is set up.
3. Write your thoughts and reflections about your observations in your blog.

Web Link
NACOL: A National Primer on K-12 Online Learning

Learning Module 3

1. Read the NACOL article (pp. 20-34) about the technology, evaluation, and legislative issues in online learning.
2. Read the general guidelines and etiquette from the CI280 Packet and be prepared for your introduction meeting with your cooperating teacher. Before you attend the meeting, make sure you have get technology ready. In most cases, you will need a laptop with certain software. If you are unable to get access to your hardware and software, inform your supervisor as soon as possible. In addition to that, check the date and time and be punctual.
3. Go to Iowa Learning Online's WebCT and log in with your ID and password. Lurk in the current unit to observe what students are doing and how the unit is set up. This time, pay attention to the pedagogy, technology, and assessment surrounding the curriculum.
4. Reflect on the reading and virtual observation, and write your thoughts on how similar or different virtual schooling is compared to traditional education in your reflective journal.

Learning Module 4

For this week, you will be observing a virtual office hour. Before you attend the session, make sure you are prepared. Go through the following checklist to make sure you have everything ready before attending the session.

- Date, time, and location. Be punctual.
- Technology: If you need a laptop but do not have one, check one out from CTLT. Make sure you have the necessary software. Some co-operating teachers like to use a chat software such as Skype to communicate with you while the office hour is in session in a different mode, e.g ICN. Don't forget to get your co-operating teacher's User ID so you can add him/her to your chat contact.

When you have any questions regarding the pedagogy, technology, class management, etc, don't hesitate to ask your co-operating teacher, BUT be tactful! You are there as an observer, not an evaluator so don't be judgmental in your tone or way of asking.

Also, complete the following tasks:

- Watch a recorded panel on VS Trends, Benefits and Elluminate. http://sas.elluminate.com/site/external/event/description?instance_id=8402 (Background note: When this session was offered live, the panel consisted of speakers located in different locations. Likewise, the audience consisted of participants from various locations. When you are watching the recording, pay attention to the interactions between the panel, moderators, and speakers which are
happening simultaneously in the Whiteboard, text chat, as well as the participant box.

- After you have completed the observation and weekly reading, go to your reflective journal and write your thoughts on the experience. Focus on the similarities and differences between online and traditional practices. Here are some questions to help your reflection:
  - What was the purpose of the office hour? What did the teacher use the session for?
  - How did the technology mediate the office hour session?
  - Did it change the dynamics of interactions between the teacher and students?
  - How is the office hour session different or similar to the way things are done in a traditional school setting?
  - What skills were most important in ensuring a smooth office hour?

Also, reflect on the recorded session. You can write your thoughts about the technology itself, i.e. Elluminate and how it works for VS. You can also look at Elluminate Live for Distance Learning Demo http://www.elluminate.com/flash_demos.jsp to get a better understanding of the features offered by this technology for VS. Also, reflect on your reactions to the content presented by the panel. Finally, include your thoughts on the comparison between the ICN and Elluminate for VS based on the two experiences.

Web Link
VS Trends, Benefits and Elluminate
http://sas.elluminate.com/site/external/event/description?instance_id=8402

Learning Module 5

For this week, you will be looking at other VS courses and technology to support VS. In the first link, you will see two brief examples of VS (Japanese and Mathematics) in Queensland, Australia. http://media.helloqueensland.net.au/WM/teachingonline.wmv

You can also see other examples of VS through demos offered by VS institutions. You don't need to go through all of them. Choose three or four demos in different content areas and explore them thoroughly. When you've completed your exploration, reflect on your observation in your reflective journal.

Florida Virtual Academy http://www.flva.org/education/grade.html

Florida Virtual School http://www.flvs.net/products_services/p_s_course_demos.php


Virtual High School http://www.govhs.org/Pages/Academics-DemoCourses
Summarizing Report

This paper should be a one-page, single-spaced reflective piece about your CI 280 Virtual Schooling Field Experience. It should briefly summarize your experience by highlighting what you learned, what were the challenges you faced and what are your current thoughts about virtual schooling. Also, include the changes in your perceptions about virtual schooling. (You can look to your first reflective journal to see what your initial thoughts were.) This report must be posted in your reflective journal/blog by November 31, 2007.
APPENDIX 3: LEARNING MODULES FOR EARLY VIRTUAL SCHOOLING FIELD EXPERIENCE (VERSION 2 – GRADUATE LEVEL)

(Note: This long version was implemented as a one credit independent study at a master level course. It contains 9 learning modules and 1 summarizing report. To download, go to http://ctlt.iastate.edu/~tegivs/TEGIVS/Field_Experience/Virtual_early_field_experience/Extendedversion.doc)

Learning Module 1
Welcome to CI 590B Virtual School Field Experience. Before you proceed further with the course, please download the CI 590B Activity Log. You will need to keep a log of all your time spent on activities relating to this course. Next, complete the survey on virtual schooling. You will NOT see a button to select CI 590, so just select Section 1 for this time. We will indicate that it is for CI 590B in general.

In this first module please get familiarized with what virtual schooling (VS) is about. To do so, I have listed the two resources in your learning module. Please read the NEA Guide to Teaching Online Courses and the VHS “Day in the Life” to get a general idea.

Once you have done that, go to your respective blogs and reflect on the following:

5. In your opinion...What are some of the characteristics a VS teacher should have?
6. In your opinion...What is the role(s) of an effective teacher? Does it change with VS?
7. What role does technology play in the responsibilities of a VS teacher?
8. At this point, what are your thoughts or concerns about VS?

Web Links
NEA Guide to Teaching Online Courses
Virtual High School “Day in the Life”
http://www.govhs.org/Pages/Welcome-Home

Learning Module 2

4. Read the NACOL article (pp. 1-19) to get an idea of common misconceptions and responsibilities of an online teacher.
5. Go to Iowa Learning Online's WebCT and log in with your ID and password. You should be able to find your ID and password from the CI280 Syllabus. If you have problems with access, contact your supervisor. Lurk in the current unit to observe what students are doing and how the unit is set up.
6. Write your thoughts and reflections about your observations in your blog.
7. Go to Iowa Learning Online's WebCT and log in with your ID and password. Lurk in the current unit to observe what students are doing and how the unit is set up. Then go to the scheduled unit for November and get prepared for your task in November where you will be facilitating a group discussion.
5. Read the NACOL article (pp. 20-34) about the technology, evaluation, and legislative issues in online learning.

6. Read the general guidelines and etiquette from the CI280 Packet and be prepared for your introduction meeting with your cooperating teacher. Before you attend the meeting, make sure you have get technology ready. In most cases, you will need a laptop with certain software. If you are unable to get access to your hardware and software, inform your supervisor as soon as possible. In addition to that, check the date and time and be punctual.

7. Go to Iowa Learning Online’s WebCT and log in with your ID and password. Lurk in the current unit to observe what students are doing and how the unit is set up. This time, pay attention to the pedagogy, technology, and assessment surrounding the curriculum.

8. Reflect on the reading and virtual observation, and write your thoughts on how similar or different virtual schooling is compared to traditional education in your reflective journal.

Learning Module 4

For this week, you will be observing a virtual office hour. Before you attend the session, make sure you are prepared. Go through the following checklist to make sure you have everything ready before attending the session.

- Date, time, and location. Be punctual.
- Technology: If you need a laptop but do not have one, check one out from CTLT. Make sure you have the necessary software. Some co-operating teachers like to use a chat software such as Skype to communicate with you while the office hour is in session in a different mode, e.g ICN. Don't forget to get your co-operating teacher's User ID so you can add him/her to your chat contact.

When you have any questions regarding the pedagogy, technology, class management, etc, don't hesitate to ask your co-operating teacher, **BUT** be tactful! You are there as an observer, not an evaluator so don't be judgmental in your tone or way of asking.

Also, complete the following tasks:

- Read the report by Tucker (2007).
- After you have completed the observation and weekly reading, go to your reflective journal and write your thoughts on the experience. Focus on the similarities and differences between online and traditional practices. Here are some questions to help your reflection:
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- What was the purpose of the office hour? What did the teacher use the session for?
- How did the technology mediate the office hour session?
- Did it change the dynamics of interactions between the teacher and students?
- How is the office hour session different or similar to the way things are done in a traditional school setting?
- What skills were most important in ensuring a smooth office hour?
- What was one most important point that stood out to you in the Tucker (2007) report?

Web Link
http://www.educationsector.org/usr_doc/Virtual_Schools.pdf

Learning Module 5

For this week, you will be attending a regional lab at a school. Before you attend the session, make sure you are prepared. Go through the following checklist to make sure you have everything ready before attending the session.

- Date, time, and location. Be punctual.
- Technology: You will need a digital camera and an audio recorder. If you do not have these items, make sure you check them out from CTLT ahead of time.

When you have any questions regarding the pedagogy, technology, class management, etc, don't hesitate to ask your co-operating teacher, **BUT** be tactful! You are there as an observer, not an evaluator so don't be judgmental in your tone or way of asking.

During your attendance at the regional lab, observe and take notes on the following questions. You can talk to the VS teacher, local school site facilitator and/or students.

- Regional Labs
  - What are the purposes of regional labs?
  - How is it different from or similar to traditional labs?
  - How often do students attend these labs in a semester?
  - How are these regional labs organized?
  - Does the local site/school only host the regional lab for its own students or are there other students from different schools? If so, where are they from?
  - Why are they asked to attend the lab at this school?
  - How many other schools host regional labs?
  - What steps do students have to take at their own schools (e.g. scheduling, time table, etc) prior to attending the regional lab?
- Observe how the VS teacher manages the lab. What preparations were done ahead of time?
• Does the local site/school provide any assistance, e.g. a facilitator or a teacher to help with the lab?
• Talk to the local site facilitator or student coach. Find out what his/her responsibilities are for the course in general as well as for the regional lab.

After you have completed the observation and interviews, go to your reflective journal and write your thoughts on the experience. Focus on the similarities and differences between online and traditional practices. You can use the questions above to guide your reflection.

**Learning Module 6**

For the next 2 weeks, you will be following an assigned group of students in the current unit. Your task will be to facilitate the discussion and alert your co-operating teacher if you notice any concerns. Make sure you read through the lessons and be prepared for your task. At the end of the 2 weeks, you will be asked to grade the threaded discussion of your assigned group based on a given rubric (located under Tools and Resources in your observed VS course) and email the grades to your co-operating teacher. [More details about the grading task will be given in the next module.]

Continue to write your reflections in your reflective journal about your virtual experience. You can write about your reaction to online facilitation, teaching and learning, or any interesting aspects that stood out to you.

**Learning Module 7**

For this week, you will continue to follow your assigned group of students in the current unit. Your task will be to facilitate the discussion and alert your co-operating teacher if you notice any concerns. Make sure you read through the lessons and be prepared for your task. At the end of this week, you will be asked to grade the threaded discussion of your assigned group based on a given rubric (located under Tools and Resources in your observed VS course) and e-mail the grades to your co-operating teacher.

Continue to write your reflections in your reflective journal about your virtual experience. For this reflection, focus on the assessment issue. For example:

• How is the assessment conducted for the course, i.e. are grades based on tests, quizzes, projects, etc?
• Is cheating an issue in this course? Why or why not?
• After grading the threaded discussion, do you think it is a good way to assess students' learning? Why or why not?
• What other ways of assessment can you recommend for a teacher in a similar VS course?
Learning Module 8

For this week, you will be looking at other VS courses. These demo courses allow you to take a peek at how other courses are offered. You don't need to go through all of them. Choose three or four demos in different content areas and explore them thoroughly. When you've completed your exploration, reflect on your observation in your reflective journal, e.g what was good, interesting, surprising, or concerning. You can also jot down your thoughts on what you might want to do for your future classroom.

Florida Virtual Academy http://www.flva.org/education/grade.html

Florida Virtual School http://www.flvs.net/products_services/p_s_course_demos.php


Virtual High School http://www.govhs.org/Pages/Academics-DemoCourses

Learning Module 9

For this week, you will be looking at other VS courses and technology to support VS. In the first link, you will see two brief examples of VS (Japanese and Mathematics) in Queensland, Australia. http://media.helloqueensland.net.au/WM/teachingonline.wmv

You can also see other examples of VS through demos offered by VS institutions. You don't need to go through all of them. Choose three or four demos in different content areas and explore them thoroughly. When you've completed your exploration, reflect on your observation in your reflective journal.

Florida Virtual Academy http://www.flva.org/education/grade.html

Florida Virtual School http://www.flvs.net/products_services/p_s_course_demos.php


Virtual High School http://www.govhs.org/Pages/Academics-DemoCourses

Summarizing Report

This paper should be a one-page, single-spaced reflective piece about your CI 590B Virtual Schooling Field Experience. It should briefly summarize your experience by highlighting what you learned, what were the challenges you faced and what are your current thoughts about virtual schooling. Also, include the changes in your perceptions about virtual schooling. (You can look to your first reflective journal to see what your initial thoughts were.) This report must be posted in your reflective journal/blog by November 31, 2007.
CHAPTER 5: SYNTHESIS AND RECOMMENDATIONS

Introduction

This dissertation focuses on the preparation of pre-service teachers for online teaching in the 21st century. Currently, there is little research literature on the preparation of pre-service teachers for online teaching. This dissertation is an effort to fill the void by researching complementary frameworks and two innovative practices from the federally funded project Teacher Education Goes Into Virtual Schooling (TEGIVS) to inform general teacher education and language teacher education. In this chapter, major themes and discussions of the three articles will be presented, followed by the limitations of the studies. The chapter concludes with recommendations for future research.

Major Themes and Discussion of Research Findings

This dissertation summarizes its major findings in three tenets: (a) All pre-service teachers should have basic knowledge of online teaching, (b) Pre-service teachers’ personal histories and prior experiences should be addressed to facilitate the conceptual change about online teaching, and (c) Virtual early field experiences should be provided to help pre-service teachers gain a better understanding of online teaching.

Basic knowledge of online teaching for all pre-service teachers

Teachers entering the 21st century classrooms require new skills besides traditional classroom teaching skills. Recent literature (Compton, 2009; Davis & Ferdig, in press; Davis & Niederhauser, 2007; Davis, Roblyer, Charania, Harms, Ferdig, Compton & Cho, 2007; Ferdig, Cavanaugh, DiPietro, Black, Mukley, & Dawson, in press; Hannum, Irvin, Lei & Farmer, 2008; Harms, Niederhauser, Davis, Roblyer & Gilbert 2006) has highlighted emerging roles in virtual classrooms including the virtual schooling (VS) teacher, VS site facilitator, and the VS instructional designer. Yet recent research has indicated that teacher education programs have not included much preparation for VS (Barbour, Kinsella, & Toker, in press; Davis & Ferdig, in press; Smith, in press). Although many pre-service teachers enter the teacher education programs with the intention of becoming teachers in a brick-and-mortar classroom, teacher education programs should still equip them with basic knowledge of online teaching because they may unintentionally take on related VS responsibilities in their
future careers and because the VS movement is redefining what it means to be “in school” (Roblyer, 2008).

A review of stakeholders in a distance education system in chapter 2 (Compton, 2009) showed that roles such as site coordinators and tutors are essential in helping to support the VS student. Yet without a proper understanding of how online teaching and learning works, pre-service teachers might be at a loss if they were suddenly assigned these roles at their future teaching locations. Chapter 2 also proposed a framework (Figure 2.2) for online language teaching skills, which suggested that pre-service language teachers can be trained at three levels of expertise, i.e. novice, proficient, and expert. Using the novice-expert continuum from general teacher education, this framework suggests that all language teachers should at least be proficient users of technology, have the basic knowledge of online teaching, and have the basic knowledge of task and course evaluation. Although the proposed framework was intended for language teacher education, general teacher education can also glean insights for their program since many of these basic requirements would be the same for VS.

To provide pre-service teachers with basic knowledge of online teaching, both general teacher education and language teacher education programs should consider integrating modules for online teaching or VS into existing methods or technology courses or offering blended/hybrid courses for two key reasons. Firstly, as stated in chapter 2, the lack of resources and time constraints would likely limit the possibility of offering different courses geared solely towards online teaching unless the university was planning to offer a separate certification for online teaching. Secondly, findings in chapter 3 show that institutional sources, such as faculty’s view and use of technology in the classrooms, can influence the way pre-service teachers accept or reject the possibility of online teaching. Furthermore, pre-service teachers would be less likely to “buy-in” to the idea of online teaching if the knowledge or training were added on instead of integrated. Therefore, faculty members should be encouraged to integrate some form of training into their existing methods or technology courses to ensure that all pre-service teachers get some basic knowledge or awareness of online teaching.
Personal histories, prior experiences, and conceptual change

Studies on personal histories and pre-service teacher education (Knowles & Holt-Reynolds, 1991; Knowles & Cole, 1996) have shown that pre-service teachers tend to enter their teacher education programs with an idea of what teaching and learning look like. Because of their years of observing and participating in traditional classrooms, they can be resistant to alternate ideas presented in their programs. Additionally, there is a widespread misconception that VS is not a good substitute for a traditional classroom (Compton, Davis & Mackey, in press; Charania, 2009 in preparation, Davis & Rose, 2007). Because research in conceptual change (Posner, Strike, Hewson & Gertzog, 1982; Strike & Posner, 1985; Strike & Posner, 1992) has shown that preconceptions can lead to a resistance to change, pre-service teachers’ preconceptions, misconceptions, and concerns about VS should be addressed.

The findings in chapters 3 and 4 show that pre-service teachers rely on their experiences as students to formulate their preconceptions and misconceptions about VS, resulting in a range of concerns. In both studies, pre-service teachers were presented with some basic information about VS through “artifactual information” (Knowles & Cole, 1996). Those that had no past experiences with VS were more likely to experience a conceptual change than those that had negative experiences with VS. In contrast, pre-service teachers who had a range of prior experiences with VS were likely to have a realistic view about VS. These experienced pre-service teachers realized that the effectiveness of VS depended on various factors such as effectiveness of the instructor, curriculum design, and course materials. The studies showed that providing relevant artifactual information can help to facilitate the pre-service students’ understanding about VS but only to a certain extent. Therefore, a more accurate conception of VS could be developed if complemented with other types of experiences such as a virtual early field experience (Compton, Davis & Mackey, in press). (See also chapter 4.)

The study in chapter 3 also shows that conceptual change about VS can be limited if pre-service teachers only receive knowledge of VS from the general teacher education program but do not receive the same encouragement or modeling in their main teacher education program. Pre-service teachers should be provided with good models of technology
integration in classrooms throughout their formal education or they may be unable to transfer their knowledge about VS into their areas of specialization or into their future practices. Additionally, conceptual change about VS can also be limited if pre-service teachers do not engage with resources that are relevant to their areas of specialization. If pre-service teachers have limited ability to help them make sense of their experiences (Hudson, Bergin & Chayst, 1993), they might not be able to transfer the knowledge into their own practices as seen in chapter 3. It is important for teacher educators to structure the information gathering process and provide ample opportunities to engage with resources from the pre-service teachers’ areas of specialization, and to reflect and discuss how they can be implemented effectively in their future practices. Otherwise, any conceptual change is unlikely to last.

Virtual early field experience and virtual practicum

Field experiences including early field experiences and practicums are not uncommon in teacher education. Early field experiences allow “teacher candidates [to] observe and work with real students, teachers, and curriculum in natural settings” while practicums provide pre-service teachers with opportunities to practice the theory they have acquired from their coursework (Huling, 1998, p. 2). Pre-service teachers should be provided field experiences that are virtual to facilitate their understanding of VS.

The findings presented in chapter 3 show that pre-service teachers arrive at a myriad of conclusions about pedagogical and academic issues when they explore a VS demo on their own. Even though the other readings provide them with an introduction to VS, there are many aspects of VS that cannot be captured through readings or exploration of an archived course. However, the study in chapter 4 found that a virtual early field experience with the same VS cooperating teacher that showcased the VS demo in chapter 3 helps tremendously because it offers the pre-service teachers an opportunity to observe how VS is actually conducted. Furthermore, the virtual early field experience should include carefully guided observations to focus on critical aspects of interaction and implementation as well as debriefing opportunities for reflection and clarification purposes.

The findings in chapter 4 show that the synchronized observation of an office hour is critical in helping the pre-service teachers fully understand how the VS students and VS teacher interacted, which was a prominent concern in chapter 3. Also, the study in chapter 4
found that it is important to include observations of different stakeholders, especially the VS site coordinator, which is usually unavailable in a traditional school setting. As recommended in chapter 2, an understanding of different roles and responsibilities of stakeholders would enable pre-service teachers to serve as site coordinators or tutors in their future teaching capacity. Thus, early field experiences related to online teaching or VS should be offered virtually and include synchronized observations as well as observations of different stakeholders, particularly the VS teacher, VS site coordinator, and VS students.

Virtual early field experiences cannot fully prepare pre-service teachers for online teaching, because observation alone cannot offer a rigorous experience (Davis & Rose, 2007) or result in substantive learning for effective teaching (Huling, 1998). Pre-service teachers need to gain more knowledge of VS and be given opportunities to put their knowledge into practice if they wish to teach online. Therefore, based on this research, I recommend that pre-service teachers who express an interest in teaching online should be given opportunities for virtual practicums in the last stage of their program as advocated in chapters 2 and 4. Such opportunities will give them the chance to practice what they have learned and gain skills at the proficient and expert levels.

Limitations of the Research

The findings of the research in chapters 3 and 4 substantiate the need to address pre-service teachers’ preconceptions, misconceptions, and concerns about VS. Many of the specific limitations have been included in the respective studies. However, a primary limitation of both studies is the absence of interview data with the pre-service teachers. Even though the use of the pre-service teachers’ reflective journals provided rich data for the studies, follow-up interviews with these participants could have provided more supportive evidence and insights. For example, in chapter 3, the findings suggested that age and work experiences could influence the pre-service teachers’ preconceptions, misconceptions, and concerns. Teacher educators that deal with professional development of in-service teachers should therefore exercise caution when applying the research findings.

The resources used in the studies were limited to science. Although I had originally intended to include resources for different content areas and different grade levels, especially
for second and foreign language, I ended up including only the selected science examples for
two reasons. Firstly, I was unable to locate good examples of online language teaching for K-
12. Even though there are many studies in computer assisted language learning (CALL)
related to effective online language learning, many are limited to higher education and
experimental studies. In a couple of instances where I had located potentially good models of
online language teaching, I was unable to obtain the assistance of the VS teachers despite
numerous attempts at communication. Secondly, I was limited in terms of time because of
the TEGIVS project deadlines and the need to implement the curriculum interventions before
the project funding ran out. As such, many of the findings are limited to evidence from pre-
service teachers’ reactions to the online teaching of science.

The findings in chapters 3 and 4 can provide valuable insights for language teacher
education such as the need to address pre-service teachers’ preconceptions, misconceptions,
and concerns prior to formal instruction and the need to provide virtual early field
experiences for better understanding of online language teaching as recommended in chapter
2. However, this dissertation did not specifically investigate how language teacher educators
can better prepare their pre-service language teachers and the types of resources that might be
more effective or suitable to help their conceptual change. Because online language courses
are skill-based and require some transmission of knowledge through synchronous
communication and language modeling, some teaching skills for an online language teacher
would differ from online teachers of other subjects (Hampel & Stickler, 2005; Sánchez-
Serrano, 2008). Pre-service language teachers would need to understand how to provide
“opportunity for conversation, practice, input, and negotiation of meaning among learners”
(Abras & Sunshine, 2008, p. 189), which can be challenging when the “subject matter is the
communication” and there is a “need to focus on the form of interaction as well as the
content” (Hampel & Stickler, 2005, p. 312).

**Implications for General Teacher Education and Language Teacher Education**

This dissertation proposed two frameworks and reported on two innovative practices
to assist general teacher educators and language teacher educators in preparing their pre-
service teachers for online teaching. Although the frameworks and the innovative practices
refer to either general teacher education or language teacher education, they provide implications for both areas.

In chapter 2, I proposed a framework (Figure 2.2) outlining the different online language teaching skills based on a continuum of expertise. This framework is a useful resource for language teacher educators who wish to incorporate such skills into their existing curriculum. For instance, a language teacher educator offering an introductory methods course can introduce strategies for online community building and socializing, for the facilitation of communicative competence and online interaction, and for online language assessments. These strategies can prepare pre-service language teachers at the novice level. Pre-service teachers who have been introduced to these strategies can later be given opportunities to practice and implement them through projects or virtual early field experiences.

While this framework was originally intended for language teacher educators, general teacher educators can also use it as a resource for their own courses for two main reasons. Firstly, the general teacher educators would find the framework to be familiar because it used the novice-expert continuum from general teacher education. This continuum of expertise allows teacher educators to differentiate the skills that should be learned in progression. Secondly, many of the skills listed in the framework apply to general online teaching. For example, any teacher teaching an online course should know the strategies for online community building and socializing. The listed skills in this framework that referred specifically to online language teaching can be adapted for any content area, for example, strategies for online language assessments can be replaced with strategies for online science assessments.

Chapter 3 provides a conceptual change framework (Figure 3.1) that shows how pre-service teachers’ personal histories as students can influence their belief system and their preconceptions, misconceptions, and concerns. This framework was proposed for the use of general teacher educators to support curriculum design but can also be relevant for language teacher educators who need to design their curriculum to help their pre-service teachers with the concept of online teaching. The findings in this chapter show that the use of relevant resources and tasks can address prior VS experiences. However, those with extensive VS
experiences might require more in-depth or research-based information to assist in the conceptual change process. Therefore, it is advisable for teacher educators to address the preconceptions, misconceptions, and concerns at the start of the instructional course so necessary steps can be taken to select and include the appropriate types of curriculum materials and tasks.

In chapter 4, the pilot case study highlights the importance of providing virtual early field experiences to facilitate the pre-service teachers’ understanding of VS. Similar to chapter 3, this innovative practice draws implications for general teacher education but can also be used to inform language teacher education. The findings of this study show that readings and online explorations of an archived course can only improve pre-service teachers’ awareness of VS to a certain extent. To facilitate a more comprehensive understanding, virtual early field experiences with exemplary VS teachers are needed because they provide synchronized observations of actual virtual classes as well as the guidance pre-service teachers need. General teacher educators and language teacher educators should incorporate opportunities for their pre-service teachers to visit virtual classrooms and observe how they are conducted.

A recent meta-analysis of online learning (U.S. Department of Education, 2009) concluded that blended instruction (online and face-to-face instruction) is more effective than conventional face-to-face classes, particularly for undergraduate and older students. They also stated that online learning is more conducive to the expansion of learning time than face-to-face instruction which had significant impact on learning outcomes. Furthermore, they found that students are more likely to self-monitor and self-reflect on their learning when they are given some control of their interactions with the media. In light of these findings, general teacher educators and language teacher educators should consider revamping their existing courses to offer blended instructions. The blended learning experience will not only provide pre-service teachers with the opportunity to control their own learning but also a first hand experience as online students, which is a necessary step in learning about online teaching (Slaouti & Motteram, 2006). Providing them with a choice of relevant and high-quality online resources to navigate, as well as the time to process and reflect on the
information would likely facilitate a deeper understanding of content and of the online learning experience.

**Recommendations for Future Research**

This dissertation has provided useful implications for general teacher education and language teacher education. However, in the course of the investigations, more questions have arisen. This section presents future research avenues of personal interest as well as recommendations for those who share similar research interests. Firstly, future language researchers should investigate the common preconceptions, misconceptions, and concerns that pre-service language teachers have of online language teaching. Such research could help language teacher educators in their curriculum design because they could then use the information to locate relevant resources and provide appropriate tasks to support the conceptual change process.

Secondly, future researchers should consider replicating the study in chapter 3 to examine the common preconceptions, misconceptions, and concerns held by all pre-service teachers. I recommend those researchers include interview data with pre-service teachers as well as discussion data (either through observation or video recording of in-class discussion or through an online discussion thread) to provide a more in-depth examination of pre-service teachers’ perceptions of VS or online teaching. Furthermore, it would be worthwhile to continue the examination of pre-service teachers’ common preconceptions, misconceptions, and concerns of online teaching as practices with educational technology continue to evolve, and as pre-service teachers’ level of exposure to technology as students and as users continue to increase.

Finally, there should be more efforts to identify different effective models of VS and good practices of online teaching according to different content areas and different grade levels. These efforts can be complementary to investigations for effective virtual field experiences, since it is quite likely that pre-service teachers who are exposed to good practices and a range of VS models in their respective areas of study are able to gain a better and more comprehensive understanding of online teaching. Furthermore, the pilot study in chapter 4 can be replicated to include virtual early field experiences from different
perspectives, such as the VS teacher, VS site facilitator, and VS students. Such research studies can also facilitate a comprehensive understanding of online teaching.

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