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The Impact of and Key Elements for a Successful Virtual Early Field Experience: Lessons Learned From a Case Study

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Abstract

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 Virtual School teaching skills and teacher's role as well as the supportive role of technology. Teacher candidates also reported an increased interest in Virtual School and learning goals at the end of the experience. Five key elements were also identified as contributive to the successful experience. The elements were 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.

Virtual schooling 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; Ferdig et al., 2009; National Forum on Educational Statistics (NFES), 2006; Roblyer, 2003, 2008; Setzer, Lewis, & Green, 2005; Zucker & Kozma, 2003).

Davis and Ferdig (2009) noted that 44 states in the U.S. offered VS opportunities to their K-12 students with doubling enrollments yearly in up to 20% of virtual schools in the last few years. In 2007, Watson and Ryan (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 students involved with VS would continue to increase and may even be amplified by legislation in some states that requires 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., 2009). 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., 2009; 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, 2009; Davis & Ferdig, 2009; Smith, 2009). 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, and 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).

Virtual school experiences over the past decade have shown that effective virtual teachers have qualities and skills that differ from traditional face-to-face teaching, such as building and maintaining a sense of trust and community among individuals who will never meet face to face. Thus, 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 included the expectations that "any regular classroom teacher...[could be] qualified to teach online" and "newly qualified teachers who learn about virtual schooling in their preservice programs will be ready to teach online when they graduate" (p. 8). Without deliberate exposure and virtual field experience, preservice teachers cannot be expected to transfer their theoretical knowledge into practice.

A consortium of teacher education programs has collaborated to better prepare their preservice teachers for this new form of education. This paper reports a case study of a pilot virtual early field experience designed to expand preservice teachers' knowledge, experience, and preparation for VS, which is also relevant for the induction of new teachers and site facilitators in VS. To showcase good practice, preservice teachers were

placed with an award-winning exemplary teacher from Iowa Learning Online (ILO). (Editor's Note: For website URLs see the Resources section at the end of this paper.)

Field Experience and Virtual Schooling

Traditionally, teacher education has placed a 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 postobservation 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 et al. (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 were influenced from their years of experiences and exposure to different teaching and learning situations and contexts, which may cause them to have preconceived images that are at odds with realities and that need to be challenged and corrected (Knowles & Cole, 1996). Field experiences provide "the first formalized opportunity for preservice teachers to verify, challenge, and modify their preconceptions" (Knowles & Cole, 1996, p. 654). Additionally, such experiences help the teacher candidates 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).

There are many approaches to VS, including different organizational structures, pedagogies, and technologies, and virtual schools typically develop their own approaches. For example, the large Florida Virtual School offers additional courses to students in brick and mortar high schools mainly through Web-based instruction, while Iowa Learning Online offers its courses through a blend of Web-based instruction and a two-way, audio-video interactive system.

The lack of a standard approach to VS has caused it to be contentious, resulting in many misconceptions about virtual schools (Charania, 2010; North American Council of Online Learning, 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 distance learning.

Preservice 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 preservice online "student teaching" might include the following:

- Research on online instruction in the preservice 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)

In the case study described in this paper, 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 a researcher's reflective journals. Semistructured 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 (Esterberg, 2002; Merriam & Associates, 2002) was employed to gain an in-depth and holistic understanding of the impact of the virtual field experience on the participants and possible improvements. 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. Semistructured 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

Two preservice teachers, one graduate student, and one VS cooperating teacher who participated in the pilot field experience were selected using convenience sampling (Maxwell, 2005, Weiss, 1994). To protect the anonymity of the student participants, pseudonyms were used. The two preservice 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 nontraditional 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 preservice teacher. To minimize confusion, both preservice teachers and the graduate student will be referred to as teacher candidates from this point forward.

The VS cooperating teacher, Mrs. 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 Teacher Education Goes Into Virtual Schooling (TEGIVS) project, she agreed to be a VS cooperating teacher for this pilot field experience.

A university field placement director was also included as a participant using purposeful sampling, based on her vast experience with field experiences and her critical input during the brainstorming stage of this pilot field experience, to ensure that the field experience would meet the goals aligned with the university's teacher education program. Mrs. Huey (real name used with permission) holds several teaching licenses in various states, including Iowa. Her 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 was an active TEGIVS project collaborator and provided critical information for the field experience team.

The first author played the role of a participant researcher. Observations were conducted concurrently with the first author's responsibilities as the field experience supervisor. The student participants involved were informed of the first author's intentions from the

beginning, and they gave their permission to participate in this research. In a later section of this paper, additional information is provided about the first author as a researcher and the multiple roles she played in this case study.

Course Structure in the VS Field Experience Course(s)

Two 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 A for a summary outline of both versions and Appendix B to explore further Web links.) 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

Multiple data collection procedures were used 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 and retrieved after the course ended. Besides that, the two synchronous sessions (the VS introductory session and the VS office hour) were videotaped, and the screen captures of the Skype text messages were converted to digital images.

Semistructured interviews were also conducted during summer 2008 with the cooperating VS teacher and the university field placement director. With the VS teacher, the semistructured interview and follow-up questions were conducted via e-mail. During the same week, a face-to-face semistructured interview was conducted with the university field placement director in her office. Follow-up questions were sent via e-mail throughout the analysis process as they arose.

The first author maintained a researcher's journal, which included ruminations of her "experiences, ideas, fears, mistakes, confusions, breakthroughs, and problems" (Spradley, 1980, p. 71) based on the multiple roles she played, including participant observer, curriculum developer, and field experience supervisor.

Theoretical Framework

Two complementary frameworks were used as "theoretical lens[es]...to guide [our examination of] what issues are important to examine [and] how the final accounts need to be written" (Creswell, 2003, p. 131): (a) experiential learning framework (Knowles & Cole, 1996) and (b) constructivist approach to teacher preparation (McIntyre, et al. 1996). These two frameworks were selected because they fit the experiential and constructivist nature of the field experience.

The first theoretical framework by Knowles & Cole (1996) emphasizes a cyclical yet spiral movement in the learning cycle. There are two parts to this framework. The first part of

the framework is a basic cycle of experiential learning with four phases. As seen in Figure 1, the basic cycle starts with 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 help them to formulate personal theories of teaching and learning. These personal theories then help to inform their future practices.

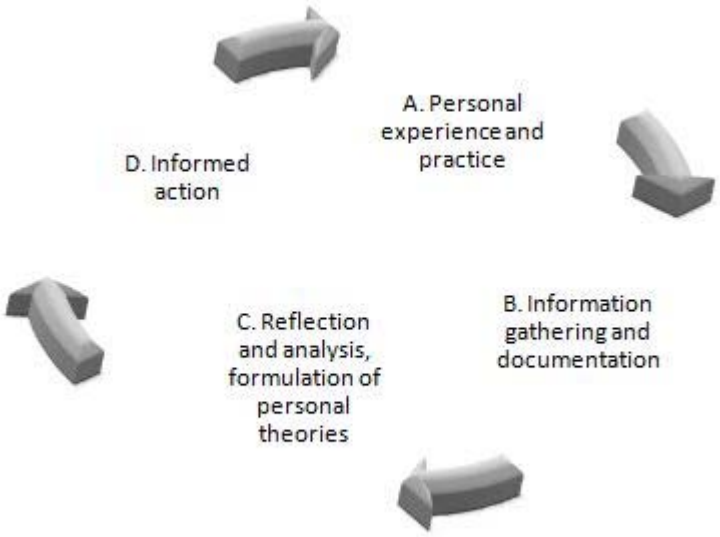

Figure 1. Basic cycle of experiential learning (based on the model illustrated in Knowles & Cole, 1996).

Figure 2 shows repeated cycles of experiential learning that facilitate the development of a reflexive teacher. These cycles illustrate the four phases from Figure 1 repetitive mode but the upward spiral movement signifies an enriched learning experience. As the learners complete each cycle, the learning experience increases in complexity and this helps to stimulate the growth of the learners.

The experiential learning framework also requires teacher candidates to reflect and analyze their field experiences and compare their 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 process is similar to the second framework for the study, the constructivist approach to teacher preparation (McIntyre et al., 1996), which emphasized 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).

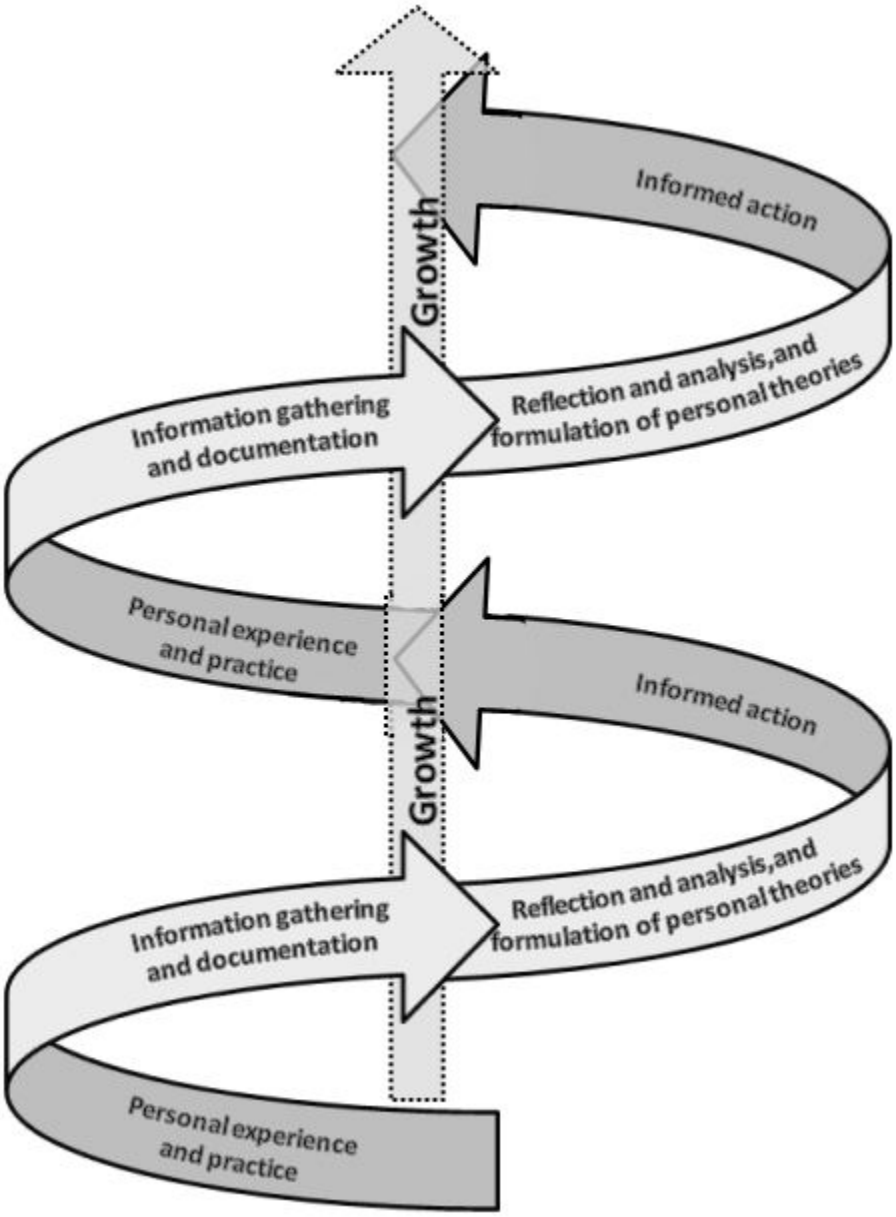

Figure 2. Cyclical and spiral experiential learning framework (based on the model illustrated in Knowles & Cole, 1996).

Data Analysis

Data analysis was conducted in three phases. The first phase was the preliminary analysis 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 linked some of the findings to the key ideas in the two selected theoretical frameworks.

In Phase 1, preliminary analysis of the reflective journals was conducted throughout the data collection period through weekly supervision and the TEGIVS meetings. During Phase 2, the reflective journals, summative reports, and interview recordings were compiled and analyzed using open-coding procedures. Significant ideas from phrases, sentences, and paragraphs were summarized with key words. These key words were then grouped into larger ideas which formed the themes followed by focused coding in which specific instances that would clarify the themes further were identified. In order to minimize researcher bias, key ideas in Knowles and Cole's (1996) theoretical framework were used in Phase 3 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.

To promote the trustworthiness of this study, several strategies were utilized. The primary strategy was 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 our findings, different sources of data were used for triangulation including the teacher candidates' journal reflections, the interview data from the VS cooperating teacher and the university field placement director, as well as the researcher's journal to build a coherent justification for the themes. Furthermore, member checking was conducted through sharing the findings with the VS cooperating teacher and the university field placement director and systematically soliciting their feedback.

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. As a participant observer and curriculum developer, the first author relied on past research experiences (see Compton, 2004a, b) and kept notes of her observations and the curriculum in her researcher's journal. Additionally, she was the research assistant for the TEGIVS project. Her continual professional development as a TEGIVS collaborator, as well as her interactions with others in the field through professional conferences, reinforced some of her perceptions of VS. Finally, she was also a novice field experience supervisor who relied on her own field experiences in Malaysia, England, and the United States.

Results

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 showed 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 was 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"). An additional research-based article on VS 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, where the participants navigated as invisible participants in the VS course and did 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 to gain access to her ILO WebCT course for lurking privileges. The participants were given individual access and a password as teaching assistants so they could observe 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 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, 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), 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. An additional 15 minutes were added to the last session for debriefing 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 onsite 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 toward 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 onsite 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 noted in her reflection, "I think I would enjoy being a student coach for a VS course sometime" (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.

> 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)

The teacher candidates also realized that the VS teacher played the roles of 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 schooling teacher's job in that they don't always guide at every second in this type of course. (Teacher candidate Robin, Reflection 3)

Understanding the Supportive Role of Technology

The use of different technologies in this pilot field experience helped the teacher candidates 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 that 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, 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 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)

Key Elements for a Virtual Early Field Experience

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. This section identifies the five key elements for a successful early field experience of VS, the challenges, and suggestions for future implementations.

Putting the "Virtual" in the Field Experience

Huling (1998) stated that field experiences allow "teacher candidates [to] observe and work with real students, teachers, and curriculum in natural settings" (p. 2). 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, for example, 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 strategy 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 provided teacher candidates with at least one online experience as advocated by the NEA (n.d.).

The synchronized observation of the virtual office hours was 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 considerable 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 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. (Interview)

Mrs. Wortmann provided teacher candidates their own login IDs and passwords 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 must 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 2 virtual office hours, which were scheduled back to back and lasted 45 minutes each. Although the observation proved to be fruitful in this case, the field supervisor noted that it might not always be the case:

> 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 preservice teachers would end up observing very little. How can we ensure that preservice teachers will observe what they need to observe? (Field experience supervisor, personal journal)

According to Mrs. Huey, 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 was 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.
>
> As the university director of field experience, Mrs. Huey emphasized the importance of field experience: "It is a critical part of [the teacher candidates'] training of what it's like to be a practicing professional....It is the one 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" (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).

Although she felt that field experience should incorporate virtual field experiences, she was also concerned that too few good models of VS with effective VS cooperating teachers are available for teacher candidates to observe and work with, and she warned that unfocused observations could 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 (1996) 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, addressing any preconceived notions or misconceptions that teacher candidates hold regarding VS is necessary, as well as helping them increase their knowledge through multiple resources. Knowles and Cole recommended two methods of exploring field experience through inquiry: gathering external information and 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. As recommended by the NEA (n.d.), 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 (Modules 8-9 in V1, and Modules 4-5 in V2) provided a 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." (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" (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 demonstrations alone could not 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 an onsite 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.

> 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)

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 analyze what they had experienced and make sense of the experience for their professional growth (see also Rudney & Guilaume, 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. Teacher candidates can be assigned a thorough reflection or journal of their past educational experiences and the expectations about VS based on those personal histories. 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, or VS student, so they can make better connections between their observations 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 V1, the meeting was mediated by the ICN, while in V2, Skype was used. Both instances required the teacher candidates to meet with their university supervisor on the Iowa State University 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 hours 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. Teacher candidates could 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" (Interview). Later, she added,

> 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. (Follow-up Interview)

Likewise, the university field experience director 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" (Mrs. Huey, follow-up interview). Therefore, 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 provided information about other aspects of the course that were not observable during the virtual office hours. Because of the first author's role as a research assistant on the TEGIVS project, she had insights into the VS course and used her 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, VS teacher and teacher candidates should 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 questions. 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 2 weeks and facilitate when necessary. At the end of the 2 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 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" (Interview). She also stressed the importance of interactions between the teacher candidates and VS students during a field experience and said 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 preservice teacher from participating. It is a type of "field observation" for the preservice 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. (Follow-up Interview)

Mrs. Huey also agreed that teacher candidates should eventually be given added responsibilities under the cooperating teacher's supervision:

> 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 student facilitator would get practice teaching or facilitating a lesson, probably not taking on a whole curriculum. We save that for student teaching. (Interview)

Including Onsite 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 onsite 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 observation was planned in advance, the VS teacher was able to ensure that the VS students assigned to the teacher candidate for tracking would be at that location. Teacher candidate Robin was able 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" (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 her explore the role of a student coach. 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. (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. (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 view points from the students and possibly the proctors behind the virtual school" (Feedback comment).

Mrs. Huey 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. (Interview)

Discussion

In this case study, two complementary frameworks, the experiential learning framework (Knowles & Cole, 1996) and the 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.

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. Their preconceptions, commonly at odds with reality, can lead to conflicts in their careers as teacher candidates.

The findings in this study show that personal history plays an important 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 was 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 could observe good practice. After all, Dewey (1938) noted,

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. 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.

McIntyre et al. (1996) added that the teacher candidates' years of public or private schooling experience could 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 a teacher's potential vision of alternatives.

The teacher candidates in this study 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 only to 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 is not better or worse than traditional schooling but it is an alternative format of education that is becoming prominent in the 21st century.

In 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 consider offering field experience not only in a variety of settings, but also in different modes, such as a virtual field experience so teacher candidates are exposed to different contexts and alternatives of education.

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 nonformal school settings, such as tutoring and remedial centers, community recreation centers, and so forth, a virtual classroom qualifies as an alternative placement that teacher education programs of the 21st century cannot ignore. However, teacher education programs should have good teacher educators who can provide a holistic look at VS (including the pros and cons) and field experience supervisors who 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. The findings show that the external information 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 cognitive skills to help them make sense of their experiences (as described by 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.

Reflection, Analysis, and 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).

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 toward 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. They compared their own prior experiences to their VS observation, and they addressed their attitudes and expectations prior to and after the virtual field experience. These critical analyses were used to form new personal theories about VS. They concluded that VS was not better but different and that technology was not driving the learning but 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 were encouraged to develop their knowledge via a reflective process following their experiences (Chiang, 2008). Chiang's study showed that the teacher candidates' reflective process during their early field experiences helped them "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 analyze critically 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.

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. Offering the field experience virtually not only allowed the teacher candidates to observe the teaching in its real context, it provided them with an online experience which the NEA (n.d.) deemed as important for teacher preparation of the 21st century. Second, 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. Finally, the inclusion of an onsite observation provided a more complete overview of 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 timeslots amidst their regular weekly activities to coincide with the VS teacher's schedule, which proved difficult. Funding was required 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 able to complete only a minimal number of learning activities, particularly in V2, which did not allow the teacher candidates the opportunity for an onsite visit. This onsite 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 can 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 needed to be effective 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 the perspectives of the VS teacher, VS site facilitator, and VS student, as well as opportunities to observe and experience different delivery platforms. 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.

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Resources

Day in the Life - http://www.govhs.org/Pages/Welcome-Home

Iowa Communications Network - http://www.icn.state.ia.us

Iowa Learning Online - http://www.iowalearningonline.org

Appendix A
Summary of the Two Versions of the VS Field Experience Course

Module	Version 1 (Graduate Level)	Version 2 (Undergraduate Level)
1	Readings, reflection	Readings, reflection
2	Readings, open lurking, reflection	Readings, open lurking, reflection
3	Readings, focused lurking, virtual introductory meeting, reflection	Readings, focused lurking, virtual introductory meeting, reflection
4	Readings, virtual office hour, reflection	Recorded panel on VS, virtual office hour, reflection
5	On-site observation of regional lab, reflection	Recorded demos of VS courses, reflection
6	Facilitation of online group discussion, reflection	none
7	Facilitation and grading of online group discussion, reflection	none
8	Recorded demos of VS courses, reflection	none
9	Recorded demos of VS courses, reflection	none
	Summary Report	Summary Report

Appendix B
Web Links for Overview of Learning Modules in VS Field Experience Course and Virtual Tours

- Learning Modules in Version 1 (Graduate Level) – MS Word Document : http://ctlt.iastate.edu/~tegivs/TEGIVS/Field_Experience/Virtual_early_field_experience/Shortversion.doc
- Learning Modules in Version 2 (Undergraduate Level) - – MS Word Document : http://ctlt.iastate.edu/~tegivs/TEGIVS/Field_Experience/Virtual_early_field_experience/Extendedversion.doc
- Virtual Tour of Learning Modules as set up in WebCT – http://ctlt.iastate.edu/~tegivs/TEGIVS/virtualTour.html .
- Video Clip of Virtual Office Hour - http://ctlt.iastate.edu/~tegivs/TEGIVS/virtual_office_hour_1.html