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USING *SECOND LIFE* AS A VIRTUAL COLLABORATIVE TOOL FOR PRESERVICE TEACHERS SEEKING ENGLISH FOR SPEAKERS OF OTHER LANGUAGES ENDORSEMENT

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ABSTRACT

This study evaluated preservice teachers' professional-knowledge transformation while they participated in simulated professional-development activities via a *Second Life* virtual classroom—an Internet-based multiuser virtual environment (MUVE). While a cohort of preservice teachers experienced the MUVE environment, the instrumental exploratory case study highlighted how 2 preservice teachers among the 12 internalized professional knowledge, as well as how that knowledge transferred into active teaching practice. The study was framed around sociocultural theory as it pertains to enabling intramental functioning through co-constructed activities. The preservice teachers' debriefings and reflective statements suggest that they entered the Zone of Proximal Development (ZPD)—the range of potential an individual has for learning, with that learning being shaped by the social environment—indicating the positive potential of using an MUVE to promote self-regulatory pedagogic behaviors.

INTRODUCTION

The influence of technology on academic and social activities (Kim, 2009; Prensky, 2010) is an undeniable reality of 21st century life. This is particularly

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evident when considering the role of emerging technologies in situational learning (Kafai, 2006). The most recent innovations in Internet-based technologies provide collaborative mediums for end users, accessible in an anytime–anyplace format. The increasing trend of using the Internet to gather information, to participate in commerce, and to maintain relationships has been noted by educational institutions worldwide. This trend enables the educational institution to offer professional development and training beyond traditional face-to-face settings in order to facilitate more authentic, utilizing innovative tools, modern teacher training.

The 21st-Century Teacher

According to Prensky (2010) and Rosen (2010), beginning teachers in the 21st century should be less resistant to modern technologies. This is especially the case with activities linked to virtual realities and social networking (e.g., Facebook). Any technology used to develop a teacher's instructional proficiencies should mediate between existing and potential abilities. Further, technology should partner teacher with student. Through this partnering, teachers (pre- or in-service) can move from digital objective to digital subjective by exploring and introducing an Internet-based multiuser virtual environments (MUVEs) into their teaching.

As Prensky (2004) pointed out, most teachers would be considered digital immigrants to the latest technologies. In establishing and maintaining a rapport with today's digital natives, teachers must understand the variety of programs that students are currently using in order to partner with them effectively for meaningful and relevant instruction (Kim, 2011; Rosen, 2010). This is especially true as those defined as digital natives vary in their technology competencies and degree of use (Margaryan, Littlejohn, & Vojt, 2011). Accordingly, employing virtual environments in teacher training provides a venue through which the pedagogue-in-training can experience not only simulated instructional experiences, but also the virtual environments inhabited by today's students (Cheong, 2010).

Integrating Multi-User Virtual Environments in Teacher Education

Educational institutions are increasingly interested in MUVEs and their instructional possibilities (Cheong, 2010). *Second Life*, in which end users interact within digital communities through the use of avatars, is one such MUVE (Linden Labs, 2004). Avatars are digital expressions of the self and, in virtual worlds, represent (or sometimes enhance) the end user's real-world persona (Ducheneaut, Wen, Yee, & Wadley, 2009; Kim, 2005). Given the greater use of the Internet, increasing numbers of educational institutions, both in the United States and around the world, have established their presence in *Second Life*: a development that demonstrates the potential of offering effective instructional

use of the virtual world (Herold, 2010; Warburton, 2009). Despite noticeable efforts, however, academic discussions of actual teaching and learning practices in MUVEs are scarce (Salmon, 2009). In particular, discussion about using MUVEs in teacher education, especially teacher education programs in the United States and international teacher training programs, is difficult to find.

The need to integrate MUVEs into teacher-trainer education is apparent, especially as more institutions of higher learning are turning to MUVEs to offer classes and related instructional content (Bowers, Ragas, & Neely, 2009; Foster, 2007; Wongtangswad, 2008). First, the updated international standards for teacher educators, such as those from the National Council of State Supervisors for Languages in the United States, strongly recommend the integration of technology into teacher education programs. In 2005, the National Council of State Supervisors for Language stated, "The foreign language profession must look to technology as one possible avenue for meeting the goals set forth in the national standards" (p. 2), confirming the new goals geared toward the dynamic, innovative world of Internet-based instructional technology.

Second, the rapid growth in the number of English language learners (ELLs) in the United States is an indisputable fact. Ten-and-one-half percent of the student population in the state where this study was conducted is non-native English speaking, and in the 10 years between 1997-2007, has shown a 2.3% increase (Peregoy & Boyle, 2008; School Data Direct, 2008). For this study, we particularly focus on the ELL population in the United States, because the preservice teachers selected for this study were completing their English for speakers of other languages (ESOL) endorsement requirements.

Third, despite the many ELLs in public school districts in the United States, some districts do not have sufficient ELLs to support preservice teachers' practicum training (School Data Direct, 2008). Thus, investigating how to prepare and implement virtual preservice teacher training programs appears vital and timely. Investigating teacher training through virtual worlds offers both teachers and administrators insight for future English-language instruction using MUVEs (Cooke-Plagwitz, 2008).

Fourth, whereas this study may suggest improvements to teacher training programs in the United States, it also has the potential to inform the research on international teacher education programs. Unlike traditional face-to-face programs, MUVEs facilitate anytime–anyplace interactions not limited to the four walls of the institution. Thus, teachers in various countries could participate in simulated training programs and enjoy the opportunity to collaborate with teachers outside of their home country. Further, the simulated collaborations could provide teachers with the capacity to structure the interactions so that they reflect their own specific pedagogic needs rather than institutionally mandated training. The 2010 Horizon Report stated that, within the next 2 to 3 years, MUVEs would take their place as a part of the mainstream instructional cadre associated with higher education programs.

REVIEW OF THE LITERATURE

The Challenge of Using Emerging Technologies in Teacher Education

Teacher education presents an especially unique challenge when considering simulated learning as a professional training tool. Emerging technologies have stimulated additional interest among teacher education and training programs. In 2006 and 2012, The Horizon Report (a New Media Consortium–Educause Learning Initiative collaboration) identified several online technologies—for example, *Second Life* and mobile multiplayer online (MMO) games—as significantly influencing learning and teaching. In conjunction with these technologies, it is also important to explore preservice teachers' self-regulation process within the zone of proximal development (ZPD)—which provides the critical ratio between actual and potential learning (Vygotsky, 1978)—as teachers implement their lessons for the ELL using *Second Life*. Through this self-regulation process, preservice teachers may progress from novices to masters (Lantolf & Aljaafreh, 1995) as they practice their teaching using teaching scenarios recreated within *Second Life*'s virtual classrooms. Lantolf and Aljaafreh (1994) delineated five levels of sociocognitive transformation across the ZPD to indicate at which point the novice (interchangeably with learner or preservice teacher, in this study) becomes an expert, where feedback as regulation helps the novice take responsibility for his or her own learning. This is the point where self-regulation occurs without support from the master or expert. So, learning becomes a collaborative endeavor necessarily through interaction with other capable individuals (Aljaafreh & Lantolf, 1994).

Vygotskian Cognitive Development through Levels of Knowledge

At Level 1, the novice cannot act independently of the master; the master is absolutely necessary in preparing the novice to commence the process of coconstructing knowledge. At Level 2, the novice is able to recognize the knowledge, but still relies heavily on the tutor's guidance through negotiated feedback. At Level 3, the novice is able to recognize the knowledge and can act upon that knowledge, but must still rely on the master's feedback. At Level 4, the novice recognizes and acts on the knowledge with minimal or no direct feedback from the master. At Level 5, the novice acts on the knowledge independent of the master. With traditional preservice-teacher training, a gap between what an ESOL-endorsed or ESOL-trained teacher actually internalizes by way of reflective practices and what is left unaltered has generated an ongoing dialogue among educational researchers (Freeman, 1996; Wallace, 1996).

Virtual Classroom as a Meditational Device

Virtual environments in teacher training represent an under-researched area in education: few studies can be found using MUVEs as a mediational tool. Girvan and Savage (2010) explored communal constructivism, which allows learners to construct knowledge collaboratively for themselves as a group and for others, as a potentially appropriate pedagogy for use in an MUVE. Andreas, Tsiatsos, Terzidou, and Pomportsis (2010) also examined the transferability of Jigsaw and Fishbowl's collaborative learning techniques to *Second Life*. They discussed matters of implementation and suggested that the majority of the implemented affordances and metaphors enhanced collaboration and learning-space awareness. Cheong (2010) investigated the impact of practice teaching in *Second Life* on preservice teachers' efficacy. He suggested that preservice teachers can gain valuable teaching practice in *Second Life* and that collaborative teaching practice is effective.

MUVEs can help teachers transcend to the expected face-to-face training for a more realistic transformative setting (Shulman & Hutchins, 2004). In addition, examining interactions in virtual training may offer educational researchers a better opportunity to unpack in-the-head professional knowledge (Erben, 1999; Wertsch, 1991). One of the potential advantages of relocating face-to-face training to a virtual environment is the opportunity it offers for preservice teachers to respond more authentically to simulated instructional conditions. Today's instructors are encouraged to demonstrate how using virtual rather than face-to-face professional training can be applied in a real-world setting (Oliver & Carr, 2009). If the dialogic engagements among these preservice teachers reveal transformative language, the results of this study will have significant implications for pre- and in-service teacher training (Cheong, 2010).

Emerging technologies have enabled the development of training programs that digitally mirror what a preservice teacher may encounter in the real world. Better, more realistic graphics, more user-friendly interfaces, and mobile technologies have contributed to the popularity of virtual programs for training. This is especially the case with an MUVE, which derives its interface from real-world collaborative scenarios (Cooke-Plagwitz, 2008). When confronted with providing teachers with real-world scenarios, instructors frequently experience situations so distant from teachers' reality that their creations are all but useless (Shulman & Hutchins, 2004). Thus, an MUVE could provide the motivational device required by learners to engage in authentic, meaningful activities while not circumventing the intended learning objective (Cooke-Plagwitz, 2008). This type of scaffolded interaction could enable internalization (and the later application) of the ESOL training by expanding the teacher's Zone of Proximal Development (ZPD; Vygotsky, 1978).

METHOD

Research Questions

As stated earlier, teacher training in MUVEs is uncommon, particularly ESOL training. The virtual world does, however, facilitate social interaction in teaching and learning (De Lucia, Francese, Passero, & Tortota, 2009; Pérez-García, 2009). Thus, the reconceptualization of traditional face-to-face preservice teacher training into a virtual training environment raises two questions for empirical consideration:

1. Which instructional delivery issues emerge when *Second Life* is used as the setting for interactions between an avatar ELL and two preservice teachers in an ESOL 2 endorsement class?
2. Which interactive characteristics are exhibited by preservice teachers with the instructor while using the virtual training environment?

Framework

Merriam's (2009), Stake's (1995), and Yin's (2008) qualitative case-study protocols guided this study's design, process, and analysis. The research question for this study was exploratory (as defined by Yin, 2008), so this study was determined by utilizing the intrinsic (Stake, 1995) exploratory case study mainly based on qualitative research methods. Using within-case analysis (Miles & Huberman, 1994), collaborative episodes were unpacked across the virtual interactions, especially as the interactions related to productive, constructive, and destructive collaborations (Erben, 2001). Finally, using portrait vignettes (Ely, Vinz, Downing, & Anzul, 1997; Spalding & Phillips, 2007), the interactions of two preservice teachers were evaluated for their relevance to scaffolded professional development.

Participants

Participants were selected using a criterion-based, non-random sampling scheme (Onwuegbuzie & Collins, 2007). Two preservice teachers are focal participants among the 12 original preservice teachers who were majoring in elementary education and were enrolled in an ESOL 2 course. At the beginning of the study, 12 preservice teachers were selected to participate in this study: in the interest of specific detail, the study focused on the experiences of two participants in the MUVE: Abby and Isabel. Additional participants included the course co-instructors, Dr. Marquis (primary instructor) and Mrs. Rosenblum (assisting instructor), and a Level-2 ELL, Mrs. Darbyshire from Argentina with Spanish as her first language. Pseudonyms were used for all participants in the study.

Virtual and Face-to-Face Settings for the Debriefings and Interactions

The two selected undergraduate preservice teachers, Abby and Isabel, were completing their practice in elementary schools and had finished the first part of their practicum experience in fall 2008. One of the researchers also participated as an observer and facilitator of the interactions in *Second Life*. As Stake (1995) suggested, "the role of interpreter and gatherer of interpretations is central" (p. 99). As the conceptual framework for this study was primarily based on sociocultural constructivist theory, we are also able to clarify our descriptions to enable readers to form their own generalizations (i.e., the naturalistic generalizations as described by Stake, 1995). Prior to the study, informed consent was gathered from all participants in accordance with the reviewing procedures of the university where this study was conducted.

Researchers created the classroom setting in *Second Life* (Figure 1), an open setting with chairs and plants. To emphasize the nature of virtual worlds, we gave the English-learner avatar a different appearance and gender from the real English learner. The real English learner was Argentinean-American Level-2 ELL in her 70s, but the avatar appeared to be a young African American (Figure 2).

Figure 1. Potential virtual venue for interactions with the ELL avatar from *Second Life*.

Figure 2. Avatar Mrs. Darbyshire created for the Level 2 ELL.

The preservice teachers' avatars resembled one of the researchers (Figure 3). Figure 4 presents the virtual classroom in *Second Life* with one of researchers' avatars, RJ Henig, used by the preservice teachers for the interactions along with the avatar created by the ELL.

Individual choices regarding an avatar's appearance could potentially affect how the end-users interact in the MUVE (Ducheneaut et al., 2009; Yee, 2006). For two reasons, this issue is particularly important when considering the avatar choice for Mrs. Darbyshire. From a theoretical perspective, using an avatar that doesn't resemble the actual person affords greater opportunity to construct new relationships in the simulated environment (Kafai, 2006), which harmonizes with the sociocultural-theory tenet suggesting that cognitive growth occurs during the interactions between a less- and a more-experienced interlocutor. Thus, the less-experienced preservice teachers would necessarily be challenged to reconcile the young, male avatar with the female Hispanic real-time voice, forcing the preservice teachers to cognitively unpack their existing knowledges (Erben, 1999, 2001; Shulman & Hutchins, 2004).

Figure 3. RJ Henig used by students to interact with Mrs. Darbyshire.

Procedures for the Debriefings, Reflective Statements, and Virtual Interactions

To address this study's research questions, information was gathered from students' *Second Life* interactions with Mrs. Darbyshire, the intersession debriefings, and the preservice teachers' initial and final reflective statements. Data collection took place during Weeks 2–6 of the ESOL 2 class in spring 2009. In Week 2, to prepare for the interactions in the MUVE, the preservice teachers read and discussed a case study related to a 5th-grade Level-3 ELL in order to comment on an ELL's cultural background and the potential modifications that could be made to the social-studies lesson presented in the case.

Also in Week 2, the preservice teachers worked in small groups to create four social-studies lessons to meet the specific language and cultural needs of the case study's ELL. After training with the avatars and the virtual classroom's features, the preservice teachers wrote reflective statements about their initial impressions of using *Second Life* to instruct the ELL. In Weeks 4–5, the preservice teachers entered the virtual classroom to instruct Mrs. Darbyshire while using the content and key vocabulary of the social-studies lessons created during Week 2.

Figure 4. Virtual classroom in *Second Life* with one of researchers' avatar, RJ Henig, used by the preservice teachers for the interactions and the ELL, the avatar created for Mrs. Darybshire for the interactions.

Data Collection

There were four data sources:(a) *Second Life* interactions recorded using Fraps[1] (Beepa, 2012) to capture screen shots of the interactions and sound; (b) follow-up intersession debriefings on the interactions and technology (the face-to-face debriefings were videotaped in the classroom and transcribed for analysis); (c) observations—one of researchers observed and noted the researcher's reflective journal throughout the research periods; and (d) final statement about the preservice teachers' experiences in the virtual classroom. In Week 6, the preservice teachers provided a final reflective statement about their experiences in the virtual classroom and perceptions of using an MUVE for instructing an ELL.

Six Data Gathering Protocols

To summarize, there were seven protocols for this study: (a) preservice teachers selected their group members; (b) they presented the ESOL-modified

[1] Fraps is basically a lightweight Windows application used to record video and capture images displayed on the computer screen. There are many features where Fraps can be used, but mostly it is used widely for screen recording purposes.

social-studies lessons for Grades K–5; (c) groups volunteered for the *Second Life* interactions—they were not chosen at random; (d) *Second Life* preservice teachers discussed their modified lessons face-to-face before entering *Second Life*; (e) after interacting in *Second Life*, the preservice teachers participated in an intersession debriefing with their classmates and course instructors on the lesson; (f) *Second Life* interactions were recorded using Fraps[2] (Beepa, 2012) and a video camera for analysis; and (g) follow-up and intersession debriefings and final reflective statements on the interactions and technology provided a different qualitative viewpoint.

Data Analysis, Analyzing the Collaborations: From the Cohort of 12 to 2 Individual Cases

Because this was an intrinsic exploratory case study framed by sociocultural theory, we employed a within-case analysis and constructed event-flow networks to explain "how structural changes induce[d] procedural and attitude changes" (Miles & Huberman, 1994, p. 139). The main data analyses consist of a) tallying instances techniques, b) qualitative research techniques, and c) creating vignettes. The data analysis sought to answer two questions.

Research Question 1 considered which instructional delivery issues emerged when the preservice teachers were instructing in the *Second Life* classroom. To better understand the participants' instructional collaborations, we analyzed data gathered from the cohort as a whole. Here, we also considered their reflective statements in addition to their commentary during the four debriefings. To construct the networks, we used Erben's (2001) technique for tallying instances of collaborative utterances in the participants' dialogue. To identify the themes, we engaged in an iterative process, continually referring back to the keywords' location within the preservice-teachers statements for coding (Glaser, 1965). Our first step was to reduce the data to broader thematic categories. Then, we memorialized specific incidents of the themes as they emerged in the data to better understand how the diversity of incidents related to the broader themes. Next, we created theoretic categories and reduced them from a higher conceptual level to more forward, more tangible concepts (Glaser, 1965). Finally, based on

[2] *Second Life* does not support any in-game video recording. So, an external recording program is required to record on-screen action in *Second Life*; this can be achieved by using the Fraps. Usage is as simple as opening Fraps and *Second Life* and starting to record by pressing the record button in Fraps once. Then, until the record button is pressed again, recording will continue. The user can know whether Fraps is recording by noting the number at the top right of the screen. When not recording it turned off, this number will be colored yellow; during recording it will turn red. In order to have a smooth recording, the frames per second (fps) should be 60 and certainly no less than 30. For licensing requirements and the source, go to http://wvigww.fraps.com. For more detailed information, see http://www.fraps.com/faq.php#videocap.

the data we coded as we reviewed, themes relevant to the preservice teachers' impressions of *Second Life* as an instructional setting emerged. These thematic nodes included: (a) positive instruction in the MUVE; (b) negative instruction in the MUVE; (c) positive interaction in the MUVE (e.g., "good," "potential," and "new"); and (d) negative interaction in the MUVE (e.g., "confused," "frustrated," and "lost").

For Research Question 2, we examined the characteristics of the two groups' interactions with Mrs. Darbyshire in the MUVE. Each group had three members: Abby, Delia, and Evie for Week 4 Session 1 and Isabel, Julie, and Karen for Week 5 Session 3. During analysis, we created event-flow networks to identify how the members of each group collaborated to construct their interactions within their group and with Mrs. Darbyshire, focusing specifically on Abby's and Isabel's interactions, as they had the most sustained contact with Mrs. Darbyshire during the MUVE sessions.

Then we created thematic nodes to construct vignettes of the preservice teachers' experiences to further explicate their interactions as described in the event-flow networks. Using a vignette to analyze qualitative data (Howe & Eisenhart, 1990) is an ethnographic technique borrowed from such researchers as Erickson and Christman (1996) and van Maanen (1998) and is intended to lend voice to the study's participants. Spalding and Phillips (2007) demonstrated the usefulness of vignettes in reporting action-research results—research typically associated with the educational venue as used in this study. In constructing the vignettes, the goal was to "make the data more accessible to the reader" (Spalding & Phillips, 2007, p. 957).

RESULTS

This study presented the following three results: (a) emergent themes, keywords, and responses; (b) event-flow networks to explicate interactive characteristics in the MUVE; and (c) two portrait vignettes of Abby and Isabel.

Emergent Themes, Keywords, and Responses

From the reflective statements related to the interaction with Mrs. Darbyshire in *Second Life*, the seven most common positive keywords were "good," "comfortable," "feel," "uses," "potential," "modern," and "new." Negative keywords were "difficult/hard," "nervous," "(unable to) see," "confused," "frustrated," "scarifies," and "lost." The positive word used most frequently in association with instruction in *Second Life* was "good." When describing the instruction, the preservice teachers also used the words "new," "potential," and "uses." Most of the preservice teachers used "good" in their reflective statements to convey their perception of using *Second Life* for instructing ELLs.

Specifically, Abby stated that, for instruction, *Second Life* would be "good for out-of-school use." Similarly, Isabel noted that it would be good for instructing "satellite students." Evie and Julie said that it would be "good" to learn a new technology, with Julie emphasizing *Second Life*'s "potential" for enhanced training. Abby suggested that *Second Life* would be a useful instructional tool outside of the traditional face-to-face class setting, such as when students were absent. Delia also recognized the benefit for extra practice, whereas Isabel thought *Second Life* would be an effective tool for students participating in distance learning. In addition to the positive value of learning a new technology, Evie thought using *Second Life* for instruction exposed the teachers and their students to a modern way of learning.

Meanwhile, the preservice teachers' negative comments about using *Second Life* for ELL instruction ranged from the difficulty of using the actual program to not being able to see the ELL. The most frequently used negative phrase was "(unable to) see." The preservice teachers associated this word with being unable to see the ELL during their interactions. Isabel was concerned that she could not see the ELL, and Karen stated that she would "not be able to see the student's expressions" in *Second Life*. The second most frequently occurring negative word related to instruction in *Second Life* was "difficult." Abby complained that *Second Life* was "too difficult to navigate," whereas Evie expected that the instruction would be too difficult with no hands-on resources. Event-flow networks follow to elucidate detailed interactive characteristics in the MUVE.

Event-Flow Networks to Explicate Interactive Characteristics in the MUVE

Creating event-flow networks of the interactions among the preservice teachers and the ELL enabled us to create a graphic to visually describe the collaboration among participants. Abby's group, including Delia, and Evie's lesson on early pioneer life in the U.S. southeast, included such keywords as explorer, pioneer, native, settler, and tribe, and was written for second-grade ELLs. The lesson included ESOL modifications appropriate for the lesson content and grade level. Due to the logistical issues (i.e., establishing turn-taking protocols, Mrs. Darbyshire's lack of experience using a MUVE), however, the preservice teachers were forced to abandon their original lesson plan in favor of asking Mrs. Darbyshire personal questions.

Figure 5 presents an event-flow network showing the interactive characteristics among Abby, Delia, and Evie. Abby's group created a clear rapport with the ELL. Our objective in constructing this network was to reconstruct the events of Session 1 in *Second Life* to elucidate the events that occurred in subsequent sessions (Miles & Huberman, 1994).

The event-flow network in Figure 6 illustrates the interactions in Session 3. Abby's interaction in Figure 5 was defined by its linearity: most of her responses

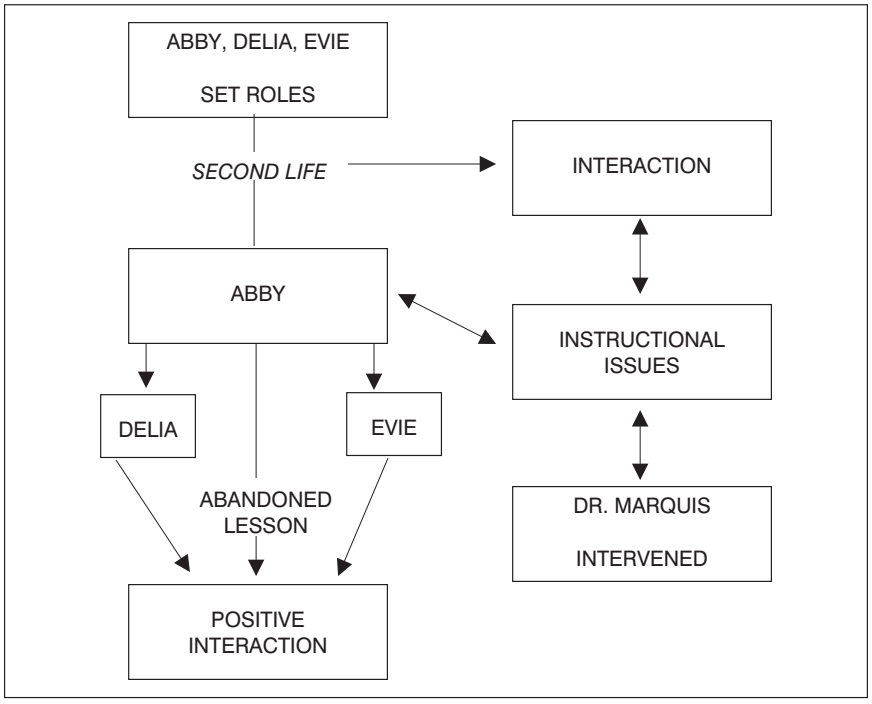

Figure 5. Event-flow network: Abby, Delia, and Evie's interactive characteristics *Second Life* Session 1.

and ESOL modifications were prompted by the ESOL II course instructor, Dr. Marquis. By contrast, Isabel's questions and modifications were more original, suggesting pedagogic self-regulation. Isabel's group was able to implement their ESOL modifications with Dr. Marquis's assistance.

According to van Maanen (1998), crafting vignettes provide access to participants' experiences in the context. To enlarge the holistic understanding of the individual participants, two portrait vignettes of Abby's experience and Isabel's experience in the MUVE followed.

Portrait Vignettes of Abby's Experience and Isabel's Experience in the MUVE

As explained earlier, soliciting two vignettes is an ethnographic technique to highlight participants' patterns and to make the data more accessible to readers in educational settings. So, we often share the main patterns of findings through the vignettes, rather than explaining all cases (Spalding & Phillips, 2007; van Maanen, 1998). We generated two vignettes in this study—Abby's and Isabel's.

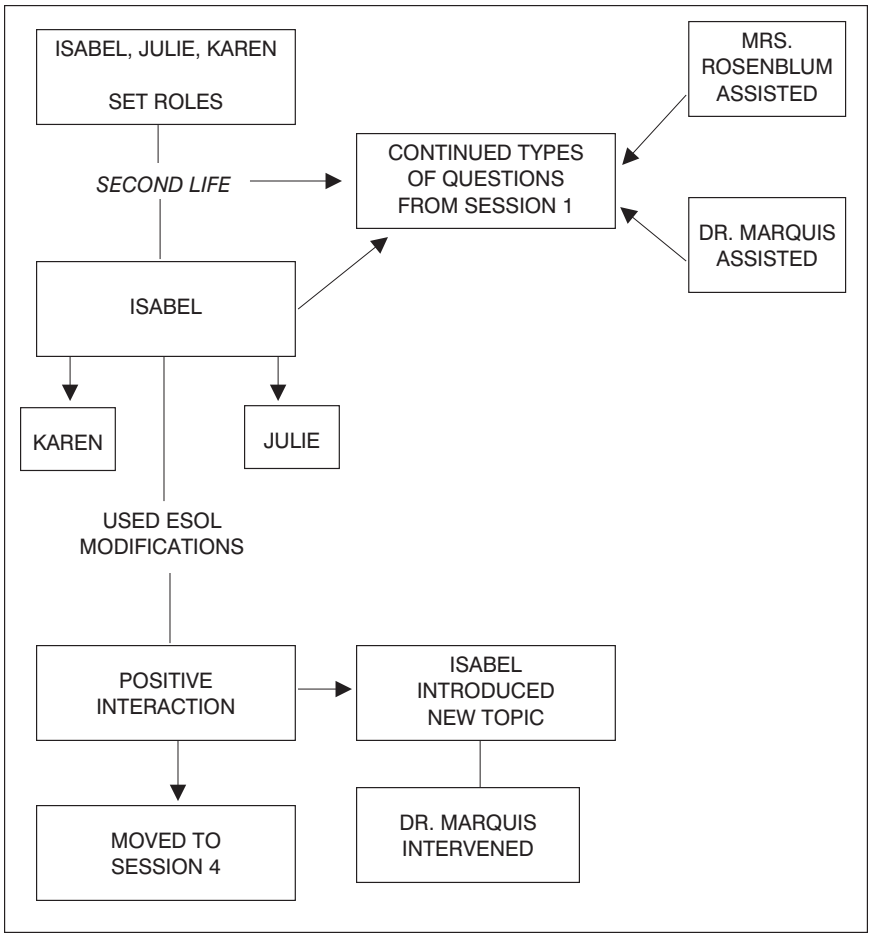

Figure 6. Event-flow network: Isabel, Julie, and Karen's interactive characteristics *Second Life* Session 3.

Vignette of Abby

My name is Abby, and I am in the elementary education program. I am a 19-year-old senior. Using technology is an important part of the ESOL portfolio process. I had a technology-in-education course taught by Dr. Marquis two semesters ago. Dr. Marquis is my supervising professor, and he introduced us to new technologies that most of us had not used before. We used a wiki for our class assignments. By using the wiki, we were able to post our lesson plans while sharing and receiving feedback from Dr. Marquis and our classmates. Outside of

class assignments, I use the Internet and e-mail daily. I also use Facebook to stay in touch with my friends and family.

As in our ESOL I course, Dr. Marquis introduced us to new technologies we have not used before. The program we used in this class was called *Second Life*. *Second Life* was totally different from any program I have used before. I wasn't sure at first how it worked or how we were supposed to use it to instruct our ELL. We received training on how to use *Second Life*. When we started to use it, I became concerned about using this program to present our lessons to the ELL. I was concerned because we are using things called avatars for the instruction. This was the first time that I had used an avatar, and it was difficult to move it from place to place. I think it would be too difficult for the ELL to navigate. I am unsure how this could replace face-to-face contact with the ELL. It might be good for out-of-school use, especially if a student misses class. Even though I had reservations about using *Second Life*, I still wanted to experience the new technology. When we started the instruction, the ELL, Mrs. Darbyshire, would not respond to us because it was too difficult for her to understand. Mrs. Darbyshire became even more frustrated with us. I thought the lesson was too hard for her as well. To reduce the anxieties on all parts, we asked Mrs. Darbyshire more personal questions instead. Once we figured out our instructional protocol, it was nice once we took the focus off of our lessons and focused on personal information and experiences.

Overall, I felt that the experience was impersonal. It is hard to envision it as the best way to meet a person for the first time, especially an ELL. I did not see tangible advantages of using a program like *Second Life* to instruct an ELL. I think it is too difficult to use this program for teaching practice. I don't think virtual training can replace what happens in the face-to-face classroom setting. I see a couple of positives, but I will not use it. We should have used Facebook instead.

Vignette of Isabel

I am Isabel, a 23-year-old senior and elementary-education major. I've had technology-in-education courses here at the university. As part of my coursework, I'm required to complete a portfolio of units with technology-infused lessons that I created for the ESOL I and ESOL 2 courses. I am also required by the state to have an ESOL endorsement for my professional teaching certificate. Outside of teaching, I use my personal computer daily to check e-mails and surf the Internet. I also use word processing programs at least once a week to complete class assignments. I have a Facebook page, but rarely use it. In my ESOL I class, we used a wiki program to post our lessons and used PowerPoint for our in-class projects. Before the ESOL I class, I hadn't used a wiki, but Dr. Marquis provided us with lots of guided practice on how to use the program.

Dr. Marquis introduced us to *Second Life*. *Second Life* was very different from the wikis we had used in other classes. We created these things called avatars that we would use to instruct the ELL. We were able to make the avatar's features look similar to our own features, and we were able to dress them in something that we might normally wear. The classroom where we interacted with the ELL looked more like a café or patio lounge area. There was a virtual blackboard that we could use, but I did not see a place for us to post any of the handouts or visual aids that we created to go with our lessons.

I think this program would be good for satellite preservice teachers, especially since the ELL will not be in the classroom with preservice teachers. This would be a good opportunity to see how it would work with an ELL learning at a distance. I also think that using the avatars would be good for an unconfident ELL. I think my group's interaction was easier because Abby's group was able to get the ELL to open up more by asking more personal questions. At the beginning of our session, Mrs. Darbyshire was very animated, but by the end of the session, we ran out of things to talk about. The session seemed unnatural, but we implemented the ESOL-modified lesson plan with Mrs. Darbyshire. If the session is well prepared and we are trained ourselves to utilize *Second Life* through professional development, it would be great to use the *Second Life* for the ESOL teacher-training program.

DISCUSSION

The results of this study illuminated instructional and interactive experiences, ultimately revealing developmental progressions across the training episodes. This discussion examines the theory that emerged about how a group of preservice teachers seeking an ESOL endorsement experienced and reflected their changes in their pedagogic implementation and professional knowledge after interacting with an ELL in MUVE. From this group, the experiences of two preservice teachers, Abby and Isabel, were more closely examined to determine how they managed to achieve intersubjectivity, enabling them to experience professional growth beyond their existing instructional skills. Thus, we (a) discuss instructional delivery issues, (b) examine microgenetic development in the preservice teachers' ZPD, and (c) construct a virtual collaborative model from the implication.

Instructional Delivery Issues

As we integrate new instructional technology, it is crucial that we recognize and address any instructional delivery issues. Four instructional delivery issues emerged as *Second Life* was used for the ESOL preservice teacher training program: (a) the creation of a course syllabus for the integration of *Second Life* for teacher training, (b) technology training for preservice teachers, (c) the establishment of rapport between preservice teachers and an ELL, and (d) the significance of intersession debriefing.

It is necessary to create a course syllabus with appropriate activities that can truly elicit the competencies under consideration. Preservice teachers reported that they did not understand the pedagogic benefit of using *Second Life* for teaching their lessons to the ELL. Abby and Isabel clearly acknowledged the positives of using *Second Life*, but recommended a more well-developed virtual world training environment for preservice teachers. The preservice teachers had to ensure that Mrs. Darbyshire's technical and language needs were being met during the interactions. The preservice teachers themselves struggled to use the avatar in *Second Life* at the beginning of the sessions, but ultimately developed positive attitudes toward an MUVE for teacher training and ELL language support. Implementing ESOL modifications did not occur until the end of the session.

It is obviously important to consider the needs of the ELL when working with an MUVE or indeed any ESOL instruction. Establishing a rapport with the ELL may provide the most significant evidence and may transform the pedagogic and technical objective to the subjective. In Session 1, once Abby realized that implementing the lesson was not working, she independently determined that a rapport had to be established, abandoned the lesson, and began asking basic personal questions (e.g.,"Where are you from?" "Whom do you live with?"). This revised approach, of course, resulted in Isabel being able to continue not only with personal questions, but also with some of the vocabulary and content of their original lessons. Thus, while the interactions and collaborations were not overwhelmingly transformative, the positive potential of using *Second Life* (Linden Labs, 2004) as a venue for professional development and classroom instruction was emphasized. *Second Life* may have the potential to provide training environments in which teachers feel more liberated to explore their true instructional selves and to transcend such institutional constraints as time and place.

Microgenetic Development in the Preservice Teachers' ZPD

The microgenetic development is used in psychology to refer to the application of Vygotsky's (1978) concept of microgenesis and is used here to reference opening of the preservice teachers' ZPDs through collaboration. Interactive characteristics exhibited by preservice teachers while teaching the ELL, Mrs. Darbyshire, and their instructor and classmates demonstrated how preservice teachers practiced levels of self-regulation associated with an individual's actual and potential development, focusing on the ZPD (Lantolf & Aljaafreh, 1995; Vygotsky, 1978). These developmental moments are enabled when the ZPD is opened so that an individual can experience growth. Opening the ZPD is what Lantolf and Aljaafreh characterized as acts of "negotiated discovery," whereby the novice (preservice teachers) and expert (Dr. Marquis) can determine what the novice can learn during the interaction. Furthermore, it is during these

moments of negotiation that the level of self-regulation is realized; assistance is withdrawn once the novice either demonstrates self-regulation or actually rejects continued support. Of specific relevance to understanding the preservice teachers' ability to achieve self-regulation and transformation is what Vygotsky (1978) defined as short- and long-term microgenesis.

In the short term, the master (Dr. Marquis) prepares the novice learner (preservice teachers) for the activity. During this initial preparation, the novice makes cognitive links between the activity and his/her preexisting knowledge. For the preservice teachers in this study, their introduction to *Second Life* in Week 3 of the ESOL 2 course served as that initial preparation. Based on the preservice teachers' responses to the technology survey questions presented in Week 2 as well as on their first reflective statements in Week 3, it is evident that the preservice teachers were making initial connections among technologies they had used in previous education courses as well as technologies they worked with in their daily teaching and personal lives.

It is in the long-term microgenetic movements where the novice and master engage in explicit and implicit collaborative iterations. These iterations are non-linear (Vygotsky, 1978), involving multiple developmental layers (Lantolf & Aljaafreh, 1995). In other words, self-regulatory behaviors are not finite and are not locked into blocks of time. Thus, it is through the socio-historical mediated collaborations between novice and master that the novice, with some intervention by the master, moves what has been learned into a higher order concept. Here (and most relevant to Abby's and Isabel's cases), Vygotsky (1978) recognized the potential for developmental regressions resulting from the dynamic and asymmetrical nature of these collaborative interactions.

Murray and Arroyo (2002) characterized the five levels of self-regulation in terms of their relationship to a computer-based instructional system. Their operational definition of the ZPD was described in terms of what the student is capable of "mastering" within the "parameters" of the tutoring environment ("M out of P," ; Murray & Arroyo, 2002, p. 754). In this stepped approach, different instructional sequences are implemented so that there are enough "hints in the problem set" for the zone to open and self-regulation to occur (p. 755). Their definition also presumes that the learner has an existing level of mastery in the problem set for which they are receiving additional instruction. Thus, they characterized the progressions across the ZPD in terms of "lucky guesses" (Levels 1, 2) to "gradual learning or improvement" (Levels 3, 4) to"an *a-ha* moment" (Level 5).

In Abby's case, she achieved Levels 2 and 3 during the interactions with Mrs. Darbyshire in *Second Life*. Where Abby received direct linear scaffolding from Dr. Marquis, this does not imply that she was cognitively impeded from developing across different levels. Abby was able to recognize the technical issues (Level 2) and was able to act on those issues by eventually implementing the ESOL modifications (Level 3). Because Abby was still dependent on Dr. Marquis's assistance, however, we can say that she did not move past Level 3.

Lantolf and Aljaafreh (1995) would suggest, based on their metric for determining levels of progression, that Dr. Marquis's interventions were more explicit. Murray and Arroyo (2002) would characterize Abby's interactions as gradual improvements. The preservice teachers were unable to implement their original lesson plans. Instead, they dialogued with Mrs. Darbyshire about her personal interests as they attempted to establish a rapport.

Isabel entered *Second Life* and began the interactions at Level 4. Isabel required little to no explicit direction from Dr. Marquis at the beginning of the interaction with Mrs. Darbyshire. By Session 3 in *Second Life*, Isabel essentially ran out of questions related to Mrs. Darbyshire's personal interests. Isabel even attempted to change the conversation by introducing the weather-related vocabulary of her group's original lesson plan, but Mrs. Darbyshire grew confused and retreated from the conversation. It was at this point that Isabel experienced regression, and Dr. Marquis had to intervene and assist her with maintaining the dialogue. Thus, by the end of the interaction, Isabel was able to positively implement ESOL modifications with Mrs. Darbyshire with assistance from Dr. Marquis, which suggests progressions from inter- to intramental development. According to Vygotsky (1978), it is possible for a learner to regress to a previous stage, but it is in that regression that the partial revelation of a higher mental state is revealed. Understanding insights and practicing these levels of self-regulation help provide better teaching to the ELL in MUVE environment. Based on ESOL preservice teachers' five levels of self-regulation through their training in MUVE environment, we proposed a virtual collaborative model (Aljaafreh & Lantolf, 1995).

The Virtual Collaborative Model

Here, we suggest a model for understanding the transition from face-to-face to virtual training as experienced by the preservice teachers in this study. This transition must reflect the alleviation of institutional constraints and sufficient allocation of resources so that the participant experiences positive socio-cognitive movement (Freire, 1990). At Levels 1 and 2 of the socio-cognitive scale (Lantolf & Aljaafreh, 1994), the ZPD is closed and remains closed until some interaction between the novice and master enables the ZPD to open. Once institutional constraints are lifted so that the interactions become more implicit, the novice then experiences Level 3. Through these iterative progressions, the novice moves from an intermental to an intramental state as the ZPD opens and self-regulation can occur.

Because this study concerned teacher education, the implications of using MUVEs in teacher-education programs must necessarily be addressed. *Second Life* assumes a certain level of technical ability on the part of the end user. In order to conduct training in a MUVE, participants (including those persons conducting the sessions) must be trained to manipulate an avatar and to use a program's various features before training can take place.

The actual content of the training would have to be reconceptualized for the MUVE environment. Simply having the preservice teachers present a traditional face-to-face lesson to an ELL avatar might not be the best method to reveal what the preservice teachers have actually internalized in terms of ESOL strategies. There must be clearly defined learning objects, objectives, and outcomes related to the competencies that participants can demonstrate before, during, and after the training sessions (Kim, 2011). The benefits of the *Second Life* environment to preservice teaching are clear: the cost benefits of avatar-enriched learning environment, distance learning, and the ability with Fraps to review sessions asynchronously. In particular, this method will be beneficial for both preservice teachers who have no access to an ELL and to ELLs who are isolated or have difficulty accessing instruction from ESOL-certified teachers. The learning objects would include creating the lesson with ESOL modifications, encountering the ELL in the virtual classroom, and implementing the lesson. The learning objectives would be to instruct the ELL while implementing ESOL strategies. Also, collaboration among the preservice teachers should be considered part of the learning objectives in order to enable them to scaffold one another's instruction to an ELL to promote self-regulation. The outcome should result in the ELL positively responding to a post-instructional assessment. Additionally, the collaborations should result in the preservice teachers experiencing an instructional transformation to the point that self-regulation occurs.

CONCLUSION

Our interest in understanding the potential of using a virtual environment for teacher training emanated our own experiences with professional development and as preservice and/or in-service trainers. In these trainings, opportunities to engage in collaborative practice are abandoned in favor of efficiency (Albion & Maddux, 2007). Also, most practice is peer-to-peer, and the results are simply intended to restate the goals of the training session. As Kwo (1996) pointed out, our reactions to the training sessions reflect what we *think* the trainer wants to hear rather than genuine reflections of what we had actually internalized from the training sessions. Atwell (2007) suggested that this situation creates a dysfunctional relationship between institutional expectations and teacher cognitive development. Also, there was no follow-up discussion after the trainings occurred, further contributing to both cognitive and pedagogic isolation (Johnson, 1997; Zembylas, 2003).

Even though, in our own instructional experiences, we considered ourselves the subjects of our pedagogic knowledge and identity, this freedom did not translate to the institution's fixed training model (Chalmers & Keown, 2006). Accordingly, our objective in this study was to determine whether relocating traditional face-to-face training to a virtual environment would be sufficiently liberating for these preservice teachers to experience authentic development

beyond their existing pedagogic knowledge. The idea of reconceptualizing how teachers receive training is rather out of fashion with current trends in professional development. One of the immediate recommendations from the Horizon Report (2010), however, was that teacher-education programs evolve training to more closely address the skillset needed by the 21st-century educator. The report noted that various innovative tools are available for educational purposes. Teacher training should be designed and implemented to support our future students in our digital society: we must move forward.

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