Chapter # - will be assigned by editors

PRACTICING COLLABORATION SKILLS THROUGH ROLE-PLAY ACTIVITIES IN A 3D VIRTUAL WORLD

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Abstract: In this chapter we report on the preliminary findings of a case study using the 3D virtual world Second Life in a pre-service teacher distance education program. We focus our analysis on role-playing and collaboration, two central aspects of social learning that we hypothesize this online learning environment is well equipped to support. We examined two sections of a graduate level special education teacher preparation course where thirty-four students participated in online learning activities, using Second Life as the primary educational platform. The results, based on qualitative analysis, showed that the sense of unselfconscious presence created through avatars and the immersion created by the 3D environment allowed learners to be engaged more effectively in practicing collaboration skills of a certain complexity (modeled after challenging classroom situations). Our data also indicate that synchronous online learning environments, represented by Second Life in our case, present great opportunities for combining traditional pedagogical approaches and virtual world pedagogy in order to overcome barriers between educational theory and pedagogical practice in teacher education programs.

Key words: Case study, 3D virtual world, role-play, interaction analysis, sociocultural approach, teacher education, special needs education

1. INTRODUCTION

Teacher education programs often have difficulties integrating pedagogical theory and practice (Muir et al., 2013; Reynolds-Keefer, 2013). Particularly, many pre-service teachers find it challenging to develop professional skills
in order to manage classrooms and student behavior (Reynolds-Keefer L., 2013; Simonsen et al., 2013). In this chapter, we investigate teaching of theoretical concepts conducted through distance education and role-play as an alternative to a conventional classroom setting. 3D virtual worlds and Second Life seem particularly well suited for this purpose, as these environments provide a platform for social learning activities, e.g. social interaction, collaboration, and role play (Vasileiou and Paraskeva, 2010; Masters and Gregory, 2012; Muir et al., 2013). However, the literature relating to the use of Second Life in teacher education is largely vague and limited.

To that end, we have studied a teacher education course designed for special needs educators organized at a North American University as part of a distance education program. We make use of a sociocultural perspective on learning for data selection and analysis. The sociocultural perspective emphasizes the social aspects of learning as prerequisite to individual learning, such as interaction among students, between students and teachers, and the effects of role-play and artifact mediation, including ICT-based tools. The general aim is to explore the potential of Second Life as an educational platform for distance education and social learning in special education, and to contribute to the discussion on the platform’s future use in education in general.

We have used qualitative methods as part of a case study, and the findings from our study indicate that the interactive nature of Second Life fosters social interaction and collaboration among its participants by means of role-playing activities. When represented by avatars, the learners seemed confident and engaged in their role-playing activities, and they were able to apply the theoretical concepts taught in the course in practical role-play activities modeled after challenging classroom situations.

2. A SOCIOCULTURAL PERSPECTIVE ON TEACHING AND LEARNING IN VIRTUAL WORLDS

Previous research argues that both social and individual aspects are important to learning (Salomon & Perkins, 1998). We have adopted a sociocultural perspective for our analysis, as it provides concepts that can help us identify the multiple contexts of learning. Christonasi and Plakitsi (2012) presented several sociocultural features with particular reference to Vygotsky’s (1978) theory for studying social interaction in Second Life, emphasizing the need to define and understand the relationship between
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learners’ self presentation, roles in a group, and cultural artifacts used to practice teaching skills by means of virtual role-playing activities.

According to Vygotsky (1978), signs and artifacts mediate human activity. Signs are connected to language and other symbol systems (e.g. diagrammatic notations), and artifacts are the concrete tools used by people in order to carry out their everyday activities as well as the results of the activity. One can think of the difference between the two as abstract and concrete tools. From a sociocultural perspective, they play a central role as “mediating artifacts”, mediating interactions between human actors, between human actors and other artifacts, and with one self (Wertsch, 2007). In addition to mediation, the sociocultural context is another central component in sociocultural studies. This implies that these components have implications for learning and should be taken into account during analysis. For example, the socio-cultural context influences our choice in tools, which again brings changes in mediated actions, a reciprocal relationship that may involve social, cultural, and institutional dimensions (Ludvigsen & Mørch, 2010; Mifsud & Mørch, 2010; Mørch, 2013; Säljö, 2010).

Second Life is a virtual world, but it is situated in the real world of its users. Researchers should be cognizant of the multiple influences (both virtual and real) that may impact learning in positive or negative directions. Therefore, we believe that in Second Life, interaction and role-play, two means of achieving social learning and collaboration, must be located socially, culturally, and institutionally. Mediating artifacts play a central role in this process, and can help us analyze to what extent educational purposes have been achieved and what new collaboration skills have been developed.

Related to the concept of mediation is the notion of zone of proximal development (ZPD). ZPD is arguably Vygotsky’s most famous concept, as it continues to be cited long after it was first proposed, and there are numerous applications to instructional design. For Vygotsky, it provided a link between social learning and individual development (Vygotsky, 1978). Metaphorically speaking, it pinpoints what can be called “buds of knowledge”, which refers to nascent knowledge that we all possess, distributed in space and time by a ‘distance’ between a person’s current state of knowledge and the potential (yet unknown) level that can be reached by further development and collaboration with more capable peers (teachers, parents, more skilled fellow students, etc.). The concept originated in studies of adult-child interactions; it implies an ‘asymmetry’ of knowledge levels and offers a technique to bridge the gap, whereby a more knowledgeable person assists a learner to reach a higher level, and if necessary changing the learning task so that learners can solve problems or complete tasks that
would otherwise be beyond their reach (Vygotsky, 1978). However, the theory was not developed in full detail by Vygotsky during his lifetime and thus was not useful as instructional support for computer applications. Vygotskian scholars further developed the concept throughout the 20th century, with techniques ranging from scaffolding (Wood et al., 1976) to cognitive apprenticeship (Collins et al., 1989). In these refinements and operationalizations, the focus is on support that allows learners to complete their tasks, and to gradually become independent problem solvers.

Later studies and system building efforts applied the notion of scaffolding and cognitive apprenticeship to interactive learning environments in a series of trials (e.g. Fischer et al., 1991; Mørch, Jondahl & Dolonen, 2005; Furberg, 2009). In this work, focused in design problem solving and reflection prompting, scaffolding takes on a new dimension, involving a combination of technological tools, tasks, and guidance, supporting students in design activities, argumentation, collaborative inquiry, and making the learning process more transparent. Similarly, through mediation and scaffolding in Second Life, we can create a new dimension of ZPD, drawing on the affordances and constraints of social interaction in virtual worlds: role-play, collaboration between learners and more capable peers, rich (computational) contexts for learning, and contextual back-talk (automated feedback).

Vygotsky’s theory combines ZPD with play (Vygotsky, 1978). Playing is a common denominator in much of Vygotsky’s work, as it stimulates motivation and provides a technique for immersion by social interaction. Vygotsky, alongside G.H. Mead, suggested that children use play as a means to grow socially. In play, they encounter others and learn to interact using language, role-play, perspective taking, and various kinds of artifacts. Moreover, this suggests that while learners need their peers or playmates to grow, they need adult feedback for guidance and control, as they master each social skill and move on to learning new skills that depend upon mastery of prior ones.

Role-play theory (Yardley-Matwiejczuk, 1997) refines the immersive component of social learning and suggests that role-play describes a range of activities involving participants in ‘as-if’ or simulated actions, where the aim is to construct an approximation of aspects of a real life situation that is either impractical, expensive, embarrassing, or risky to carry out in the real world. For example, someone may be asked to ‘imagine’ being in a dentist’s waiting room, awaiting a painful procedure, or to be a victim of a mugging (Yardley-Matwiejczuk, 1997). Role-play may last for short periods of time (minutes to hours) and provide a crude rendering of a complex situation, or it may last for days to weeks, involve many participants, and provide a semi-realistic model of a real-world situation (e.g. simulating a hostile takeover).
Role-play is related to perspective taking, which is a concept in social psychology where one sees a point of view from another person’s position and then acts as though one were that person (Mead, 1934). Social scientists have studied how people (fail to) take on the perspective of the other when they act on a shared object. For example, during a business transaction of a commodity, both buyer and seller must take each other’s perspectives towards the shared object of exchange for proper understanding of the activity. Reciprocal perspective taking is a prerequisite for a group of collaborators to successfully understand a complex situation involving multiple actors with different backgrounds, and role-playing can be an effective technique for learning perspective taking (Prasolova-Forland et al., 2013), in particular when the learners take turn in playing different roles (Gillespie, 2006).

3. SECOND LIFE IN TEACHER EDUCATION

Previous work has shown that teacher education programs often have difficulties integrating pedagogical theory and practice (Muir et al., 2013; Reynolds-Keefer, 2013). The teachers in training are exposed to several educational methods and techniques that they are required to put into practice in a real classroom. Particularly, many pre-service teachers find it challenging to develop professional skills in order to manage classrooms and student behavior (Reynolds-Keefer 2013; Simonsen et al., 2013). Difficulty in terms of implementation could be because theory taught in a teacher-in-training classroom does not connect well with the day-to-day practice in the actual classrooms of working teachers. Many of today’s teacher education programs are exploring alternatives to integrate theory and practice. One such alternative is 3D virtual worlds like Second Life. This option provides a platform for practicing various role-playing scenarios that can be useful when teaching theoretical concepts and modeling problematic situations in classrooms. Virtual worlds allow students to engage in social interaction, collaboration, and conflict resolution at a distance (Vasileiou and Paraskeva, 2010; Masters and Gregory, 2012; Muir et al., 2013). By practicing working through difficult situations in a virtual environment, teachers in training will get a semi-realistic preview of the equivalent real-life situations.

Although the body of literature concerning SL practice in teacher education is limited (Muir et al., 2013), some researches have suggested that 3D virtual worlds can be integrated throughout a teacher education program in order to provide pre-service teachers with the experiences needed to apply
teaching skills in real school contexts. Based on these promises, Cheong, Yun and Chollins (2009) used Second Life as an educational platform where 160 pre-service teachers were guided to practice teaching skills collaboratively. The findings showed that Second Life seems particularly well suited as an experimental teaching method compared with traditional classroom-based methods.

Vasileiou and Paraskeva (2010) carried out a research project using Second Life to teach role-playing instructions to educators. Role-playing instruction is a strategy broadly used in various educational settings where participants assume different professional roles in a collaborative environment, according to a given scenario. On this basis, they are able to carry out a roleplaying game and develop social skills while reflecting on their learning process (Dabbagh, 2005; Vasileiou and Paraskeva, 2010).

In another example, instructors used Second Life in a distance education course in literature to teach role-playing to fifteen primary and secondary school teacher students. The 3D environment showed a positive influence on learner engagement and motivation; and it was found to be especially well-suited for socialization and collaboration among the participants, as it “was based on qualities like readiness to collaborate and to communicate, willingness to be exposed and to effectively participate in learning activities, and a genuine and friendly atmosphere” (Vasileiou and Paraskeva, 2010, p. 43).

In the VirtualPREX role-play environment, pre-service teachers train to develop pedagogical skills and self-confidence before practicing in a real classroom. Gregory and Masters (2012) argue that virtual role-play can enhance the theoretical component of pre-service education. Their results showed that, although students prefer the real-life version of the learning activity, they find the virtual role-play easier than the face-to-face one, since it provided them with a high degree of immersion. Along the same line of reasoning, Christonas and Plakitsi (2013) suggest that role-play in Second Life is more effective than role-play in face-to-face settings. In virtual worlds, users find it more natural to play a role, feel less self-conscious of their actions, and find it easier to familiarize themselves with social concepts, such as collaboration and knowledge sharing. The learning process through play from the sociocultural perspective can thus be considered a “social achievement” and identifiable in social interaction.

Based on our limited literature survey, we have found that outside of role-playing and perspective taking, key aspects of sociocultural theory (e.g. artifact mediation) are not used in the analysis of teacher training courses conducted in virtual worlds. Our study aims to fill this gap and apply a broader range of sociocultural perspectives in our analysis. We believe it is fruitful for teacher education programs to explore the potential benefits
offered by Second Life for practicing teaching skills based on educational theory, especially those skills and concepts that depend upon, or can take advantage of social interaction, collaboration, and role-play.

Given these findings on teaching and learning in teacher education, our research aims to investigate the following open issues and research questions:

1. How relevant do the pre-service teachers find the environment of SL in terms of practicing collaboration skills?
2. How do the artifacts in SL facilitate role-playing activities among learners?
3. How might SL foster social interaction and collaboration through relevant role-playing activities?
4. How can social interaction and collaboration in SL promote learning?

4. METHODS

A qualitative research analysis was employed, combining a case study (Yin, 2003) and virtual ethnography (Hine, 2000). The use of the case study approach was considered as the proper method for investigating the phenomenon of Second Life as a platform for collaboration and role-playing. A virtual ethnography was employed to collect data on how pre-service teachers engaged with the virtual world, specifically how Second Life made collaboration and role-play meaningful.

We examined the use of Second Life in two sections of a graduate-level special education teacher preparation course, held at a North-American University. The course was arranged after working hours and used Second Life as the primary educational platform and all course sessions were held online. In total, 34 students were enrolled in the course and took part in seven one-hour class sessions, divided into: interactive lectures of theoretical concepts (15 minutes), individual activities (5 minutes), small group activities in separate rooms (30 minutes), and role-play activities in plenum (10 minutes). During both the group activities and role-play activities, students practiced the collaboration skills that are often necessary for special education teachers (i.e. conflict resolution and interpersonal problem solving). Interviews were conducted afterward. All sessions and interviews were observed at distance and video-recorded (in total 15 hours of raw video data) using screen capture software, such as BSR, Camtasia and SnagIt. Conventional ethical procedures to ensure informed consent were followed,
as specified in the Norwegian Social Science Data Services (NSD) guidelines.

In the outset, our research design was informed by a mixed-method approach (Tashakkori & Teddlie, 2010), taking into account multiple sources of data: spoken interactions and chat logs, automated screen capture in mp3 or avi formats, questionnaires and interviews. Questionnaires were sent to the participating students through a web-based survey after the end of the course. However, only seven students returned the questionnaire and only one student and the teacher were available for an interview. Consequently, the outcomes are not generalizable. The questionnaire consisted of nine Likert-type items, with questions centered on the previous experiences of users in Second Life and Second Life’s affordances in the learning process. The quantitative data served as a background to help us zoom in on the qualitative data (online interactions and interviews), which is the focus of the study.

In order to collect and manage the qualitative data (spoken utterances, chat logs, and interviews) each session and interview were stored in a separate file and transcribed in its entirety using linguistic conventions according to interaction analysis (Jordan and Henderson, 1995). Interaction analysis was chosen because it is concerned with understanding how conversation works, especially verbal communication (textual or oral), as well as how it interacts with nonverbal communication, like intonation, gestures and non-verbal symbols used in chat (smileys, etc.). However, we excluded non-verbal communication since avatars in Second Life have limited possibility for expressing non-verbal signals of relevance for this study.

To categorize the qualitative data, two researchers reviewed the corpus. We employed an iterative process in which we grouped data by using a so-called open or thematic coding technique (Strauss & Corbin, 1998; Givens, 2008). Data were placed in named categories as they were ‘discovered’ in the data material (i.e., qualitatively different from previous data), and the categories were adjusted as we identified new instances of data. This form of data encoding is linked to grounded theory (Strauss & Corbin, 1998), because it starts with a “clean slate” (with a minimal assumption of what to find, systematizing data along the way or bottom up). However, it is difficult to start with a clean slate because any analysis is based on researchers’ prior knowledge, experience and prejudices, and the premises and constraints defined by research projects (e.g. project aims, learning goals, research questions, theoretical perspectives) (Givens, 2008). We have therefore used a combination of bottom-up and top-down systemization of the data included in our information. The following three categories have been identified as most representative: mediating artifacts, role-play, and social interaction.
5. DATA AND ANALYSIS

We organized the data thematically into three thematic categories: mediating artifacts, role-play, and social interaction. We reproduced eight excerpts of interaction data and interview data as representative examples of the three categories, which we use to substantiate our claims.

5.1 Mediating artifacts

The majority of the pre-service teacher participants were first-time users of Second Life (SL). Data transcripts and questionnaire responses showed that the learning activities in the virtual world environment provided them with an increased awareness of how to apply the theoretical concepts taught in the course. The PowerPoint slides occupy a significant position within the main classroom, allowing students the visual representation of the theoretical concepts in a shared and dynamic space (Figure 1).

![Figure 1. Teacher and students discuss the theoretical concepts shown on the poster slides along the walls. Two researchers are observing the event.](image)

5.1.1 Excerpt 1: PowerPoint slides mounted on poster stands

In the following excerpt, the teacher shows and discusses with the students a series of concepts taken from the subject matter being taught (special needs education) by means of PowerPoint slides mounted in the virtual classroom walls (Figure 1).
Teacher: Let me just look at these other slides real quick to see if there was anything else with the resolving conflict I wanted to (...) to talk about before (...). Time goes so fast in here (...) ahm:: You can read these slides, I’ll put them in a box for you (...) ahm, at the front of the... Yes, the rest of these are pretty self-explanatory so: ahm, we’ll move on to... There are two slides I want to talk about with conflict before we move onto resistance (...) So if you could follow me to the other side of the room (...) these are my two favorite quotes ever (...) So this first quote here, and you’ve seen it in your group buildings (...) it’s by Isaac Newton and it’s, ‘Tact is the art of making a point without making an enemy.’ (...) So the next time that you’re involved in a conflict situation (...) I want you to think of that quote: ‘Tact is the art of making a point without making an enemy’ (...) How could approaching conflict from this perspective change the way that you’re involved in it?

[14:42] TL: my reaction
Teacher: How could that change your reaction, TL?
[14:42] HM: You will approach the conflict with an open mind rather than feeling you need to defend yourself.
[14:42] TL: Be more understanding of the other person.
[14:42] MG: Only Newton could have said something like that.
[14:42] MS: To be more sensitive
[14:42] AD: Approach it calmly and make your points well thought out.
[14:42] ST: Try to see the other person’s point of view.
[14:42] YD: Think before you speak.
[14:43] LJ: Calmly

Teacher: you approach the conflict with an open mind rather than feeling you need to defend yourself (...) excellent (...) Be more understanding of the other person (...) definitely (...) MG, yes ((laugh)) only Newton could have said something like that (...) definitely (...) MS, to be more sensitive. AD, approach it calmly and make your points well thought-out, definitely (...) ST (...) try to see the other person’s point of view (...) excellent (...) YD, think before you speak (...) Ahm:: and:: (...) LJ says calmly and with that in mind (...) if you think about this before you get involved or when... in the moment that you’re involved in a conflict situation.

The pre-service teachers learned about theoretical concepts, such as conflict and resistance, by observing the questions presented in the slides, discussing, and sharing their opinions with the rest of the class. The teacher
at the end of the first utterance asks the students a question, which they answer one by one (most of them using chat). The teacher repeats their answers and gives them constructive comments (using voice).

5.1.2 Excerpt 2: The “box” as mediating artifact in Second Life

All the interviews took place after the end of the course. The following is an excerpt from the interview with the teacher.

“When I first started teaching, in Second Life, before I went to the Sloan training (...) I used to type everything into the chat text. ((Well)) then it would disappear, and so I'd have to type it again. Or, I - I IM'd every student individually (...) um, like by typing, for the instructions. Um, and it was very ineffective and very non-time efficient, because it would take me forever to type to each student what they were supposed and (...) so, the boxes, once I learned how to build the boxes, in order to disseminate the information, that was the way that - was the most efficient. Um, so far (...) for getting that information to multiple people.”

The teacher explains why she prefers to use “boxes” for sharing information (Figure 2). The choice of using boxes was considered an easy way to communicate information.

Figure 2. Pre-service teachers are actively involved in running the role-play activity. They have a “box” positioned on the table to share and access documents.
These tools (boxes) are then used both by teacher and students as a special type of SL artifact, as an efficient way to create and share documents and other files among the group (Figure 2). However, just like an overhead projector is a tool for teachers, their usefulness is not always apparent and sometimes tools break down. We also found this to be the case here. Some groups encountered difficulties in making the boxes available for the rest of class to buy (which is the technique in SL required for getting content out of boxes). In other words, we observed a discrepancy in perceived benefit in using the artifact among the teachers and some of the students, or alternatively there is a relative steep learning curve for understanding how to use this tool.

5.1.3 Excerpt 3: From notecards to boxes: artifact-mediated collaboration

In the following excerpt, pre-service teachers are working in small groups. After creating a scenario for the role-play activities, they need to create notecards, intended as instructions for the actors, which are then put in the boxes (see Figure 2).

JK: Could we make the scenario between the collaborating... the two collaborating teachers, Miss Williams, the special ed teacher and I forget who the English teacher was, ahm:: but between them two and how they think that they should help him?

[14:16] MS: Mr. frost

HM: What if we were to make it with the principal? What if it would just be an IEP meeting?


HM: We just want it to sound like and look like the ahm:: students are... (...) well, our peers will be in an IEP meeting discussing Franklin (...) and:: we’re going to... is it going to be the negotiation skills they’re going to practice?


ST: OK, now that we have kind of the scenario and the skills, everybody in agreement with what we have for the scenario and the skill?


[14:17] OK.
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ST: OK, now we need somebody to make the box.
HM: You all go together and do that. I kind of… can we build it in here?
ST: I’m not sure if we can or not.
HM: I think we can build it here, we just have to put it in our inventory before we leave. I have one (...) started, I’ll try to get it so you can see it.

HM: That’s a fancy box. Is it changing:: the scenery on it or are you changing that? (..)
MS: Yeah, can you see it?
HM: Yeah, I can ((laughs)) (...) OK, tell me when you… we get something that you like.

In this instance, the learning process in the 3D virtual world had a positive impact in relation to the understanding of the subject matter, since learners performed their tasks together and simultaneously. By creating and working on the same artifacts at the same time, the learning experiences became more collaborative and artifact-oriented than just communicating with peers.

5.2 Role-play

The pre-service teachers in training were asked to create a role-play scenario based on a case study assignment. They were assigned to select collaborative skills for their classmates to practice during the role-play activity. In addition, each member was assigned a specific role in coordinating the activities: leader, organizer, timekeeper, secretary, and facilitator.

5.2.1 Excerpt 4: Planning role-play activity

The following excerpt shows how one of the pre-service teacher groups planned their role-play activity:

ST: Is our situation going to be like Franklin and other -- and other teachers or is it going to be like teachers talking about Franklin or:: (...) what? You know, what kind of scenario? I think we’ve got to think of what kind of scenario first and then think of what kind of skill we should practice.

JK: I think that we could do something like ahm:: the teachers talking about what they can do to help him, like what is the best help. I mean, because that’s kind of what we’ve struggled on too, what is the best help for Franklin? Do we try and seek counseling for him, do we just punish him for making dirty pictures and making shanks at home, like what is the best for Franklin?


ST: So do you think that might fall under negotiation? (...) Because they’re... teachers are kind of negotiating with each other about (...) what would be best for him.

[14:15] JK: I think that or conflict

By planning the role-play activities in collaboration, students were highly motivated to take part in the group discussions, thus making sense of the theoretical concepts taught in the course.

Particularly, the excerpt illustrates how the role-play in Second Life provided the pre-service teachers with a significant level of immersion and realisms, since they interpreted their roles by practicing real collaboration skills and exploring learning situations more safely than in the real world, which is further illustrated in the next excerpt.

5.2.2 Excerpt 5: Comparing real and imaginary situations

The following excerpt is taken from the interview with one of the students who was asked what advantages and disadvantages one can identify in virtual role-play compared with the real world counterpart:

“Being on Second Life was (...) uh (...) oh what’s the word I wanna say, it was not as intimidating as if I would have had to stand up and role-play with someone in person so I just I felt more confident.”

By role-playing the scenarios several times without any of the moral responsibility they would have had in a real classroom, pre-service teachers got the opportunity to both act and reflect on the learning process. By being engaged in reflection and discussion about the role-play, learners were able to explore different classroom management strategies before acting them out in real life.

5.3 Social Interaction

The findings showed that the Second Life environment fostered a form of social interaction that is supportive of collaboration by catering to meaningful communication without expressing prejudices among its users.
5.3.1 Excerpt 6: Comparing face-to-face and virtual (SL) communication

This excerpt is taken from the student’s interview. She was asked what differences exist between communication in SL and communication in the real world.

“I think it’s easier to speak in SL because you don’t see the other person looking at you and ... a little more outgoing... If I was in that room with other people it would have taken me a little bit longer to get adjusted and acclimated to everyone’s personalities. And I think it’s harder in real life because you can’t just go to the chat walks and make a quick statement. You have to sit there and wait for people to stop talking. There are certain social norms you have to follow. But with SL you can go to the chat walks and make statements and there were still some times we tried to be polite with each other and to follow the social norms.”

We can glean from the transcripts that the virtual learning environment in Second Life offered many opportunities for rich social interactions, since the students felt more confident about taking part in learning activities due to the lack of prejudices based on the users’ face-to-face appearance. However, having an active role in SL learning activities also required oral skills combined with textual discourse (chat). Pre-service teachers used both means of discourse. However, they seemed to prefer using chat in order to avoid sound problems with the ‘speak’ button and the noise associated with multiple people attempting to speak at the same time.

5.3.2 Excerpt 7: Role play successfully planned by collaboration

In the following excerpt, one the groups has just finished planning the role-play scenario:

JK: We’ve got everything (...) in a line now, which makes me feel a whole lot better.
HM: I had no doubt that we could do it, we’re superwomen.
[16:04] ST: Go team! Ha ha.
MS: We were just overachieving with trying to write a behaviour plan.
HM: I know, I think we were just... I tend to do that a lot, over-think things. But I’m glad that you guys met with her and you realized it’s not as much as we were making it out to be.
[16:05] JK: Ha ha, we are super
MS: I’m glad that we thought it was harder than it really was instead of (...) expecting it to be really easy and it turning out to be really difficult.

[16:05] HM: Yeah.

Although some students encountered technical difficulties managing their own avatars, we found that the support of the virtual environment was in general very good; it enabled collaboration and increased motivation and engagement. It is worth noting that even though some students had difficulties in the beginning and feared it would not work out, it turned out to be the opposite for most of them, as the following quote from the excerpt illustrates: “I’m glad that we thought it was harder than it really was.”

5.3.3 Excerpt 8: The feeling of belonging to a group

The following excerpt, taken from the interview with the teacher, shows why SL was found to be the more suitable educational platform in many respects, and particularly in fostering social interactions among learners:

“Um, social interaction in Second Life, I feel like, is - Second Life lends itself to social interaction, as compared to Wimba [an VLE integrated with Blackboard LMS]. So, for distance education, I think, Secon:: - for me Second Life is the (...) my preferred educational platform for social interaction, because you actually get the physical presence of a person. And, in, um, Wimba, unless you're using video conferencing (...) you don't get that physical presence of a person (...) Um ((and that this class)), being in Second Life, it - it really helped them to feel like they were part of a group again. Um, were they didn't have - they felt disconnected. From the, um (...) inst:: from online education. With being in Wimba. They didn't feel connected to other people.”

Compared to other platforms supporting online learning based on social interaction and artifact mediation, the virtual environment of Second Life seemed particularly well-suited for distance education, as it features a 3D-graphical representation by means of avatars that are able to interact and communicate with audio or chat.

6. SUMMARY OF FINDINGS

The results of the data analysis indicate that the learning we observed in Second Life was highly motivating for the students. They took part in collaborative and role-play activities and were deeply engaged; they applied
the theoretical concepts taught by the teacher, which in turn aided the students’ learning of key concepts in special needs education. The latter is a hypothesis at this stage, which we intend to study in more detail in subsequent work.

We also observed that well-designed virtual learning activities and a teacher’s constructive feedback and in situ guidance by visiting each of the working groups in a round-robin fashion facilitated the group work. For example, Excerpt 1 shows that the group members expressed their opinions through more complex and analytic discourse. They were able to contextualize the conflict situations described in the scenarios by role-play (Excerpts 3-4). This also allowed them to practice collaboration skills, involving critical thinking and cooperative problem solving (Excerpts 5-8).

Second Life cannot replace real classroom practice, but the results we report suggest that SL had a big impact as a new kind of mediating artifact, defining new ways for teachers and learners to communicate (Excerpt 2). This artifact was indeed effective because we observed that the students did not have time for socializing, which was also confirmed by the teacher during the interview. The students were immersed in developing their own understanding of the concepts taught in the course by making scenarios modeled after real classroom situations and playing them out.

7. GENERAL DISCUSSION

We discuss our findings according to the four research questions raised in the beginning of the chapter.

7.1 How relevant do the pre-service teachers find the environment of SL in terms of practicing collaboration skills?

The findings from the study indicated that the interactive nature of Second Life fostered social interactions and collaboration by means of role-playing activities. The sense of physical presence created through avatars and the immersion created by the 3D environment, allowed learners to be engaged more effectively in practicing collaboration skills. The Franklin case in Excerpts 3 & 4 is an example of this. The outcomes of this study showed that Second Life not only was particularly well suited as an experimental teaching method compared with the traditional classroom-based methods (Cheong, Yun & Chollins, 2009) but also that the virtual role-play turned out
to be an excellent way of applying the theoretical concepts taught in the course. Indeed, role-play in Second Life seemed very effective; the participants enacted their roles less self-consciously than in the real world, as judged by our observation that the participants were not influenced by the embarrassment that may occur in a real context.

7.2 How do the artifacts in SL facilitate role-playing activities among learners?

Several artifacts were built by the teacher and made available to all participants, such as: presentation slides, wall posters, boxes, notecards, etc., allowing easy access to required information and providing participants with ubiquitous access to the theoretical concepts covered in the class. This was possible because Second Life provides its users with many significant and mediating artifacts influencing human activities (Christonasi and Plakitsi, 2013). The pre-service teachers had an active role in the learning process, as the tasks were open ended and required improvisation, knowledge sharing, and some teacher guidance and prompting. By enacting the scenarios and practicing social skills in role-play with their self-created avatars, students showed a high level of engagement. The case study demonstrated that Second Life is a platform with a set of flexible tools for communication, coordination and collaboration that will encourage users to create a strong sense of group cohesion (Christonasi and Plakitsi, 2013). However, the majority of the pre-service teachers were first-time users of Second Life and mastering the technology required some time, especially for adjusting audio input/output.

7.3 How might SL foster social interaction and collaboration through relevant role-playing activities?

Observations and data transcripts showed that the collaboration within the groups was successful since the members were able to share information by means of different communication tools (voice and chat). Furthermore, they could work with pre-designed, semi-structured learning activities in order to practice both social and technical skills and gain new ones (e.g. interpersonal problem solving and technology skills). Second Life enabled social interaction by supporting meaningful communication in different types of situations, allowing the users not only to develop social skills and reflect on their learning process (Dabbagh, 2005; Vasileiou & Paraskeva, 2010), but also to develop agency: to take an active part in the learning process with a confident attitude.
Compared to other online learning environments, such as the asynchronous environments Moodle or Wimba, the synchronous 3D virtual world seemed more suitable for distance education in this kind of learning community, i.e. the size of a classroom (20-35 students), as the avatars’ graphical representation gave the participants a sense of “physical presence” in the online learning environment, which again made it easier for them feel part of the study groups. Despite these benefits, some of the students encountered technical difficulties in managing their avatars and gaining access to the required objects. Nevertheless, we found that the structure imposed by the virtual environment was relevant and sufficient; it let the learners be actively engaged within a few (1-2) hours of use.

7.4 How can social interaction and collaboration in SL promote learning?

When analyzing the data in terms of students’ individual achievements, we observed that Second Life provided the participants with individual ZPDs based on a combination of interaction, contexts (university, work, home), more capable peers (teachers and advanced students), and tools mediating actions in SL. This trialogical connection allowed for a lever of confidence within the students’ ZPD, providing a (motivational) bridge for linking social learning and cognitive development (see Excerpt 5). This should be considered a hypothesis at this stage, requiring more detailed research to elaborate.

8. CONCLUSIONS AND DIRECTIONS FOR FURTHER WORK

The finding from this study indicate that learning processes based on collaboration and role-play can benefit the support of a 3D virtual world like Second Life. This type of synchronous online learning environment provides a semi-naturalistic setting for practicing collaborative skills mediated by a new class of artifacts, which are highly adaptive and modifiable by skilled teachers.

However, some limitations should be cautioned; the learning activities depended on the active participation of teachers and students. The success of role-play as a learning method depends on the teacher’s planning of the learning activities according to educational goals. In one of the interviews, a student said: “There are other classes I think Second Life wouldn’t work
very well, but with a specific style of course where we were learning how to collaborate with people, I thought Second Life was…mhmm... absolutely a wonderful tool!”

Despite the potential of 3D virtual worlds in education, research interest in this field is still in an embryonic stage. Thus, 3D virtual worlds need to be integrated throughout teacher education programs in order to provide pre-service teachers with necessary experiences to apply professional skills in real school settings. In this area, there is plenty of opportunity for more research.

The findings of this study were in part limited by the lack of sufficient interviews with the students and questionnaire responses. This can be attributed to the fact that students were asked to volunteer to fill out a questionnaire and take part in an interview after the end of the course, coinciding with end of semester holidays and after a busy workday (the participants were pre-service teachers).

An important direction for further research is to compare and discuss the pros and cons of virtual teaching and traditional teaching of topics in education. Moreover, for space reasons, it was not possible to analyze how the use of the 3D environment impacts social presence. In further work, more attention should be paid to combining traditional pedagogical approaches and virtual world pedagogy, especially in situations requiring or lending itself to collaborative learning, team work, social interaction, and learners’ involvement in open-ended (e.g. design problem solving) educational activities.

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