In this chapter we discuss an exploration of the ways that virtual worlds can facilitate cross-cultural collaboration in higher education, and the benefits, issues, and challenges in designing and implementing cross-national collaborative learning activities in virtual worlds. The case involves graduate students in Israel and the United States working together in virtual teams in Second Life (SL) to design a learning activity that uses the affordance of a 3D virtual environment. The goal of this collaborative learning activity was to enable the students to understand the learning strategies as well as the potential benefits and limitations of virtual worlds like Second Life to support collaborative learning. The results provide insights on cognitive, social, and teaching presence factors in virtual world learning activities.

Background and Related Work

Virtual worlds offer new opportunities for cross-national collaboration. Games such as World of Warcraft, in which over 11 million participants from different countries collaborate in guilds and on quests, have demonstrated the power of cross-national collaboration (Jarmon, Lim, & Carpenter, 2009).

Virtual worlds also offer the potential for cross-cultural collaboration in higher education because they provide conditions for experiential, embodied, and social reality spaces (Jarmon, 2009). In a virtual world environment, students can see one another’s avatars, teleport themselves, or meet with the group on an
island to create the feeling of being together. The virtual world offers a stronger sense of place and the presence of others than text-based environments such as online forums and bulletin boards. Even in other synchronous environments like Elluminate, where you can speak with peers and see them using a web camera, there is still the sense that “they are there, and you are here.” In contrast, characteristics of the real world, such as topography, movement, and physics all contribute to the sense of “being there” in a virtual place (Smart, Cascio, & Paffendof, 2007). Virtual worlds such as Second Life provide opportunities for performative, experiential, collaborative, and game-based learning (Warburton, 2009). These environments also allow students to explore their own identities, or take on new ones (Mayrath, Traphagan, Jarmon, Trivedi, & Resta, 2009). Thus, the experience may be much more than immersion in a new context, but rather, the adoption of new and different roles.

Virtual worlds provide a unique context to explore cross-national collaborative activities in order to better understand the effects of cognitive, social, and teaching presence on engagement and motivation in the learning of transnational students. Previous studies show that environments such as Second Life enhance student motivation and engagement, facilitate collaboration, and provide immersive, experiential learning opportunities unavailable in other asynchronous and synchronous environments offered by traditional learning management systems (Aldrich, 2009; Dede, Clarke, Ketelhut, Nelson, & Bowman, 2005; Gee 2003; Kirriemuir & McFarlane, 2003; Prensky 2006; Shonfeld, Resta, & Yaniv, 2011).

This case study was focused on understanding: (1) the student experience of working collaboratively with students from another culture and country in a virtual world environment; (2) the strategies for, benefits from, and challenges of planning and implementing transnational collaborative learning activities in such environments; and (3) student perceptions of social, cognitive, and teaching presence when completing the collaborative learning task in a virtual world environment. In the following sections we provide a summary of the learning activities in Second Life, the students’ perceptions of the learning experiences as indicated in their surveys and interviews, and implications and recommendations for the design of virtual world collaborative learning activities.

Case Description

In this case study we explored the experiences of students participating in a transnational collaborative learning activity in Second Life. The data was collected during the fall of 2009, 2010, and 2011. In the second and third year of the project,
two graduate classes in Texas and Israel participated in the project. Most of the students were graduate students who worked, mainly as teachers.

The 2009 virtual world project involved graduate students in an Environmental Education class at Kibbutzim College in Israel, graduate students in a computer-supported collaborative learning class at the University of Texas at Austin (UT), and pre-service teachers at the University of Calgary. Graduate students enrolled in courses titled “Online Environments for Teaching and Learning” at Kibbutzim College and “Computer Supported Collaborative Learning” at UT participated in the 2010 and 2011 projects.

In all three projects, the collaborative learning activity took place over a period of six weeks. Because of the steep learning curve of Second Life, the students were provided opportunities to establish their avatars and explore the virtual world before meeting and working with students from the other country. The instructor at the University of Texas at Austin held his office hours in Second Life prior to the collaborative learning activity. The students at Kibbutzim College were asked to create their avatars and explore Second Life before the start of their class, which began in the middle of the semester for the US class.

Three important factors related to collaboration in online environments are teaching presence, social presence, and cognitive presence.

Teaching presence is the ability to manage and coordinate learning activities and environments (Rourke, Anderson, Garrison, & Archer, 2001), including design, facilitation, and direct instruction (Garrison, 2007). It also involves directly and indirectly facilitating social interactions and stimulating higher levels of cognitive processing. To support teaching presence, the teams were provided with training in the use of Second Life and given strategies for effective learning in teams. The collaborative learning task was a complex one that required the effort of all team members. Social interactions were monitored and mentored by the instructors who frequently participated in team meetings in Second Life.

Cognitive presence is the degree to which the learners can construct understanding through sustained communication and reflection (Rourke, et al., 2001). There are four phases of cognitive presence (Garrison, Anderson, & Archer, 2000):

1. The Triggering Event, which generates issues for consideration. In this project, the triggering event was the learning task. Each team had to design and carry out a collaborative virtual world learning activity
that would use the affordances of a particular setting in Second Life to support it. If the focus of learning was on, say, an historical event, it required selecting a place in Second Life in which the atmosphere of the period would provide an authentic context for the activity. The teams could design their project to include any of the following activities:

- Conducting a small-scale qualitative research study that involved observing or interviewing participants in a social space;
- Role-playing that involved an historical re-enactment or performance;
- Providing a virtual field trip to a 3D environment that facilitated the students’ understanding of scientific concepts and principles;
- Providing a language immersion experience in a culturally appropriate context to facilitate dialogue in the language and foster cultural understanding; or
- Designing a Virtual World Quest using the WebQuest model, in which at least part of the quest involves an experience in a specific Second Life environment.

2. Exploration of issues through brainstorming, questioning, and information exchange. To make a decision related to the type of learning activity and site to be used for their collaborative learning project, the students jointly visited prospective sites such as museums, famous structures, and historical places. Then they brainstormed ideas for the type of collaborative learning activity that might take place at the site, and researched the history or aspects of the real world site represented in the virtual world.

3. Integration to construct meaning based on the ideas generated in the exploration phase. The teams met synchronously in Second Life and communicated asynchronously to evaluate the relative strengths and weaknesses of the learning activities and sites being considered.

4. Resolution to build consensus as learners confirm their understanding and apply new ideas to solve problems. The teams came to consensus on the learning activity and site and began to work jointly on the development of the learning activity storyboard.
Social presence is the degree to which learners can present themselves socially and emotionally in a learning community (Rourke et al., 2001). Social presence facilitates cognitive objectives by creating conditions for learners to feel secure enough to openly communicate with one another and develop a sense of community (Garrison, 2007; Garrison & Cleveland-Innes, 2005). At the beginning of the project, each of the team members introduced themselves and shared information about their professional and academic background and personal interests. The meetings in Second Life, where students could see the avatars of their team members and hear their voices, built a greater sense of “knowing” their colleagues. The challenging task and time constraints helped develop trust among the team as they worked on the design activity. As they made progress on the activity, team members reported an increased sense of community and group cohesion. Teams that experienced problems in communication reported less of a sense of community and group cohesion.

One of the major challenges in conducting a transnational project in a virtual world is finding times when students are available to meet in the virtual world. This problem was most prevalent in the 2009 project because there were a few teams that had one or more team members who could not attend the planned Second Life meetings. To address this problem in subsequent projects, the students were asked to provide the days and times they were able to meet in Second Life. This information was used to ensure that there was at least one day and time each week that all team members were available to meet.

Description of Activities

The teams were composed of four to six students, with approximately the same number of students from each class on each team. This varied based on day/time availability, level of competence in English, and members’ technology skills. Planning meetings were held in Second Life in informal settings to provide a more relaxed environment for discussion (Figure 12.1). There were also outdoor areas in the virtual world where groups could meet if the class meeting space was not available (Figure 12.2).

To select the appropriate context for the collaborative learning activity, the students visited various Second Life sites, such as universities, museums, synagogues, mosques, historical sites, and cities. The teams also had asynchronous discussions using Moodle to discuss their ideas and develop the storyboard for their planned collaborative learning activity. When the teams completed the project design, it was implemented in Second Life, recorded using Camtasia, and evaluated by other teams and the instructor.
The final product of each team was a PowerPoint presentation with video clips or pictures from the virtual world collaborative activity. The clips showed how students changed their avatars according to the location and period where their activity took place. For example, students dressed as Mayans in Ancient
Mexico (Figure 12.3) or as Muslims and Jews for a discussion about the conflict in Jerusalem. The first year project required students to develop a collaborative inquiry activity similar to a WebQuest. The second and third year projects allowed teams to choose from a variety of activities, such as a Virtual WorldQuest, field trips, or role-playing.

![Students’ avatars dressed like Mayans in Chichen Itza, Mexico.](image)

**Figure 12.3** Students’ avatars dressed like Mayans in Chichen Itza, Mexico.

**Evaluation Method and Results**

To understand the students’ experience in this activity, the researchers used both a survey and interviews. The online questionnaire was used to gather student perceptions of engagement, social presence, and sense of community in the project. Eight students and one Teaching Assistant were selected for follow-up interviews to obtain more extensive information on perceptions of the learning experience.

**Social Presence and Engagement**

Twenty-seven students answered the questionnaire. Most of them (85%) had not used Second Life before the project. The three main variables that emerged in the study were engagement, social presence, and satisfaction. Our findings reveal that there is a significant connection between social presence and satisfaction, and between group connection and engagement. There is also a significant connection between engagement and satisfaction. There is a significant correlation between the number of meetings and engagement (Table 12.1).
Table 12.1 Pearson Correlation Between Main Variables: Social Presence, Engagement, and Satisfaction

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<thead>
<tr>
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<th>Social presence</th>
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<th>Satisfaction</th>
<th>Meetings</th>
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<td>Social presence</td>
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<tr>
<td>Engagement</td>
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<td>Satisfaction</td>
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<tr>
<td>Meetings</td>
<td>.186</td>
<td>.334*</td>
<td>.310</td>
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*p < .05. **p < .01. ***p < .001.

The qualitative results of the interviews were similar to the quantitative results, providing additional evidence of students’ sense of social presence and engagement in virtual world collaborative learning environments, as these statements show: “We had an avatar, in Second Life you feel like you are in new real life . . .” (A). “That actually opened my thinking about Second Life . . . In fact I got so excited that we have gone afterwards into the telecampus and worked on building some other things in Second Life . . .” (M). Other students made similar statements, also expressing their increasing engagement in both the context and interactions in the virtual world.

**Intercultural Collaboration and Group Work**

Most of the students answered the question about what they liked most about the project. They emphasized the diversity of the groups, the international collaboration, and the process of building group cohesion while designing the collaborative learning activity. The students found sharing intellectual work with those of another culture informative and exciting, and, as one student describes, the opportunity to work with students from another culture added to their sense of engagement. “It was thrilling because we were always meeting someone who lived at the opposite end of the world and we did some project together in the virtual world, which is the part I’m very interested in . . . ” (G).

The students’ descriptions of the collaborative learning activity included many of the elements of cognitive presence:

1. The triggering event was the task to design a collaborative learning activity in a virtual world.
2. It required exploration, the process of selecting and designing the collaborative learning activity through brainstorming, questioning, and information exchange.

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3. The process involved the *integration of ideas*, not only in terms of the type of collaborative activity to be designed but also the most appropriate context to carry out the activity.

4. The team reached consensus and a *resolution* when they chose the project to design.

The students explained that they learned more because they were exposed to multiple perspectives and dealt with topics they would not have otherwise considered. One of them stated, “Exposure to different ways of looking at things, different knowledge that they bring into particular topics out there, absolutely help you understand the topic that you are studying a lot more. . . .” (G). Collaboration was also seen as one of the advantages: “What I liked in the project is the cooperation between the teams. . . .” (Mu).

However, “Group Work” was problematic when some team members were unable to participate in the Second Life meetings: “Actually, group work on the project was somewhat problematic . . . they had a snowstorm . . . so most of our group work was accomplished asynchronously” (R). Some teams also had problems pacing the collaborative work, which affected the sense of group cohesion. Comments reveal that collaborative work is not always easy: “the students from Israel brought a slower pace to the conversation. . . . I think Americans have the tendency to just blow ahead real fast. . . . It teaches me to slow down.” (M). Clearly, students must make adjustments for cultural differences. Despite these difficulties, once students experienced the intercultural collaboration, they learned about not only the subject but also about cultural styles of work. M’s comment was one of many that highlighted the perceived benefits of the project, including culture, language, learning skills, learning management methods, and technology skills.

**Time Constraints**

The six-week duration of the project meant teams had to work intensively to complete the project within the allotted time. Although ideally such a project should be carried out over a longer period, this was not possible because of the differing academic calendars of the institutions.

A second time-related problem was the differing time zones the students lived in, and the difficulty of scheduling meeting times that would work for all team members. One of the students referred to these complexities: “The difficulties were in time zones, time zones differentials, and in particular with the students in Tel Aviv, although it turned out to be almost as problematic for the
students in Canada as well.” (Y). The difference in time zones required students to be flexible and open to meeting at times that would not normally be convenient, such as very early in the morning or late evening.

Language as a Challenge

Another challenge was students’ varying levels of competency in English, which we chose as the official language for team members’ communications. The groups that included Israeli students with a limited level of English proficiency encountered problems in communicating with and understanding their UT team members. The problems were exacerbated on some of the teams that included UT students who also were non-native English speakers. One of these students noted, “my native language is Korean . . . the language barrier in this situation wasn’t easier for both of us to make a fine piece of artwork . . .” (D). One Israeli explained that the language problem affected his ability to contribute: I couldn’t be effective . . . because of my poor English.” (E).

Interestingly, the native English speakers did not perceive language as a barrier: “I found they could speak English for the most part very well. Do they have an accent? Sure, but most people in Texas have an accent too” (M). These statements reflect the tendency of non-native English speakers to often underestimate their ability to effectively communicate with their native English speaker teammates.

Technology/Tools

Several interview questions related to the use of virtual worlds technology. One issue that arose in the project was that of bandwidth. Second Life requires a specific computer capacity and bandwidth to run effectively. Some of the students in Tel Aviv had limited bandwidth access that negatively affected their participation in Second Life meetings. The other students had little patience with the technology barriers and, based on their frustration level, suggested that students without adequate bandwidth should not participate in the project. One student expressed the frustration that resulted from the lack of access to adequate broadband connectivity by other team members. “[T]hen the biggest problem was lack of Internet activity for the students in Tel Aviv in terms of broadband connection . . . I felt . . . the software ran more fast when I talked with X one of my classmates from San Antonio.” (M). Students also expressed frustration about audio and communication problems, and certain Second Life features that restricted group work.
Discussion

In this case study, we explored the learning experiences of students in a transnational collaborative learning activity in a virtual world, using the framework of cognitive, social, and teaching presence. We observed all three presences in the project, showing that the community of inquiry model is a useful framework to understand the interactions of students in a virtual world. The survey and interview results identified both the benefits and challenges of planning and implementing a transnational collaborative learning activity in Second Life.

Among the key findings were the connections between

- Social presence and satisfaction;
- Group connection/cohesion and engagement; and
- Engagement and course satisfaction.

Most teams indicated a positive experience and a sense of community and group cohesion that increased during the project. There were four reported factors that weakened group cohesion, sense of community, and task performance:

- Limited English language skills of team members;
- Limited attendance of Second Life meetings because of time differences and schedule conflicts (in the early project);
- Technical problems using Second Life because of limited bandwidth; and
- Challenges in pacing the collaborative work during the project’s short duration.

Learning to use Second Life was difficult and time-consuming for most of the students who had no previous experience with it. This challenge was less significant for the UT students, who were able to use Second Life for a month before the project began. The virtual world collaborative learning task also posed challenges because many students had no experience in online collaborative work. Despite these limitations, the collaboration style of the teams was established as members became familiar with one another and the task.

The results of this case study support the findings of an earlier study that examined a collaborative learning activity in Second Life (Traphagan et al., 2010) with on-campus and off-campus UT students. Both studies indicate the ways social, cognitive, and teaching presence interact with virtual world tools and learning tasks and effect group cohesion. The relationship of these factors in the case study is depicted in Figure 12.4.
In summary, the case study identified many benefits to students who engage in a collaborative learning activity in Second Life. It also identified a number of challenges that should be carefully considered in planning this type of project. We make several recommendations:

- Provide time for students to become familiar with the virtual world before engaging in a time-constrained collaborative learning task.
- Assign to teams a student from each country with high language proficiency to help teams communicate more effectively.
- Have students provide information on their availability to attend virtual world meetings. Use this information to organize teams and assure there is at least one weekly time that all team members can gather to meet.
- Be specific about bandwidth and computing capacity minimums required to work effectively in the virtual world.
- Provide training and scaffolding on working effectively as a member of an online collaborative learning team.
- Provide mentoring to guide the teams in developing effective collaboration strategies.
- Monitor virtual meetings to identify teams that need help carrying out the collaborative activity.
Future Directions and Conclusion

Future research is needed to better understand the relationship of teaching, cognitive, and social presence to tools, tasks, and group cohesion. Our experiences in this case study have led to other virtual world projects that have fostered cross-cultural understanding between Israelis and Arabs, or enhanced the learning of a second language (Shonfeld & Raz, 2012). Virtual worlds offer new opportunities for collaborative learning, and their promise and potential will be realized through further research.

REFERENCES


