the jaltcalljournal

ISSN 1832-4215
Vol. 9, No.1 Pages 3–22

Towards a model for mapping participation: Exploring factors affecting participation in a telecollaborative learning scenario in Second Life

Airong Wang
Mid Sweden University
airong.wang@miun.se

Mats Deutschmann
Umeå University, Sweden
mats.deutschmann@engelska.umu.se

Anders Steinvall
Umeå University, Sweden
anders.steinvall@engelska.umu.se

Regular Paper

*The aim of the present study is to examine factors affecting participation in telecollaborative language courses conducted in virtual world environments. From recordings of a course in sociolinguistics conducted in Second Life (**SL**), we determine degrees of linguistic participation (voice and chat), and triangulate these data with questionnaire responses and observations in order to elucidate demographic, behavioural, and contextual factors that may have affected the outcomes. Findings suggest that power relations in terms of educational level, the task design (creating engagement), the presence of the teacher (evening out participation), the medium – **SL** (both negative and positive) and technological issues (negative) are of primary importance.*

Introduction

Much of the popularity of virtual world environments in language education, where **SL** is the most frequently reported on (Stevens, 2006), can be attributed to their unique affordances supporting learner-centred collaborative designs. Such affordances include the open-ended, 3**D** character and visually immersive nature of **SL** (Warburton, 2009; Peterson, 2010); the representation of the 'self' through a modifiable 'avatar'; the avatar's ability to perform all sorts of actions in the environment (walk, run, sit down, dance, fly, be teleported to various locations, exchange objects etc.) (c.f. Jauregi, de Graaff, & Canto, 2011); the various modes of synchronous and asynchronous communication available, including text chat, voice chat, instant messaging and note cards (Blasing, 2010); the availability of tools for community-building (Salmon, 2009), and

the added advantage of collaborative building possibilities and physical simulation, where students themselves can contribute to creating learning experiences for others (Good, Howland, & Thackray, 2008).

As suggested above, many educators point to **SL** as an environment particularly well suited to social learning. Dalgarno and Lee (2010, p. 22), for example, emphasize that an important contributory affordance here is the "sense of place," which helps to foster "greater closeness within the group and richer communication because of the ability to draw on spatial and non-verbal cues." In language education in particular, this affordance has been exploited in synchronous telecollaborative designs aimed at bringing students from different language backgrounds together in order to use the target language in authentic communication. Active participation, i.e. that students not only listen and observe, but also contribute (in speech, in writing or through actions) to the interaction, is a prerequisite for such designs (see, for example, Deutschmann, Panichi, & Molka-Danielsen, 2009; Peterson 2010, 2012a; Jauregi, Canto, de Graaff, Koenraad, & Moonen, 2011; Wang, Song, Xia, & Yan 2009; Wang, Song, Stone, & Yan, 2009; Moore & Kearsley, 2011).

Designing synchronous telecollaborative tasks, however, is not an easy undertaking and many pedagogical, organizational and technical issues have to be addressed (Guth & Helm, 2010). As pointed out by O'Dowd and Ritter (2006), problems can arise at several levels of the process: at the socioinstitutional level, at the class level, at the individual level, at the technical level etc., and the more complex the learning environment is, the more likely it is that something can go wrong. Given the complexity of environments such as **SL**, it is thus particularly important to be aware of how various factors can affect participation positively and negatively when embarking on online learning of this kind.

However, as pointed out by Liou (2011), this is no simple matter. There are potentially endless combinations of synergetic interplay between task design, learner attributes, sociolinguistic factors, technical affordances etc. that all may have an effect on the learners' dis/inclination to participate, and the more complex the environment and/or the learning design the more complex such analysis becomes. At the present time, there are simply very few models that can be drawn upon for instructors and course designers using **SL** (Mayrath, Traphagan, Heikes, & Trivedi, 2009, p. 127).

Based on experiences drawn from what is arguably a fairly typical **SL** language learning scenario, namely a telecollaborative learning event between a heterogeneous group of participants from institutions situated in different parts of the world, this study aims to start sketching a model of which key factors may affect participation in contemporary virtual world language learning, a pursuit we believe to be important for all language teachers and course designers working in this field.

Literature review of factors affecting participation in multi-user virtual environments

Based on the study of synchronous communication in less complex environments, namely instant messaging and chat in Web**CT**, Hrastinski (2007) proposes some key factors influencing participation (see the model below from Hrastinski, 2007, p. 106).

While this model provides a useful starting point, we believe the interplay of factors is more complex in virtual world environments, especially in telecollaborative learning designs, and below we will start mapping these complexities by listing some of the factors

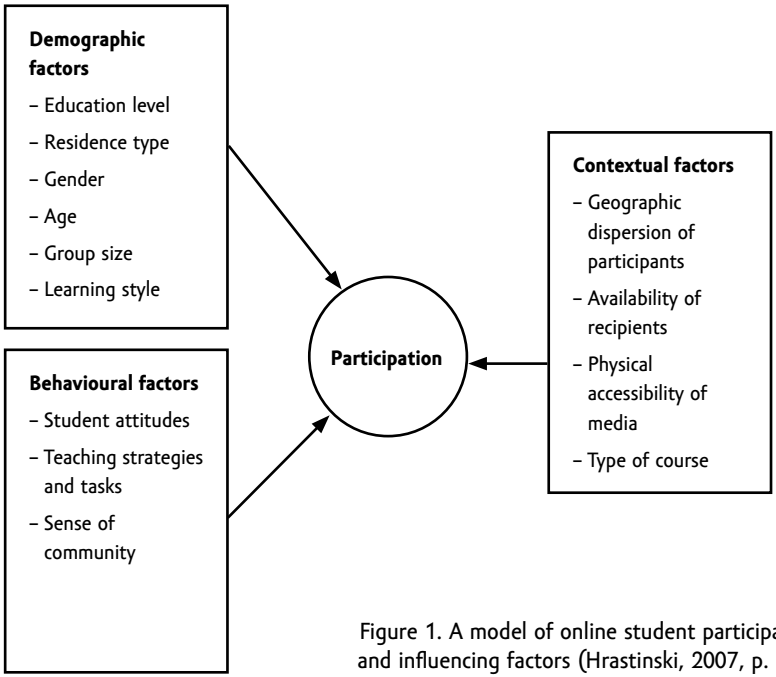


Figure 1. A model of online student participation and influencing factors (Hrastinski, 2007, p. 106)

affecting participation that have been noted in virtual world language learning research to date.

Under the category 'Demographic factors,' Hrastinski lists 'education level,' but unlike this study, however, most SL studies to date have explored academically homogenous groups and little is known about this factor. However, another aspect of 'education level,' and of particular interest in telecollaborative events, is language proficiency in the target language. Jauregi, de Graaff, & Canto (2011) point out that language mastery could give participants a more powerful position in a collaborative task, but as yet there is relatively little empirical evidence to support this. To the contrary, Deutschmann *et al*. (2009, p. 218) and Deutschmann and Panichi (2009a, p. 318) actually showed that some of the most proficient participants in their study took up relatively little floor space. Another aspect of language proficiency, particularly relevant in telecollaboration, is competence in *cross-cultural* communication. Here skills such as reflecting on behaviours, customs and styles and being aware of how to communicate in a clear and understandable manner by, for example, clarifying concepts, all play a part towards establishing a meaningful collaborative environment. Jauregi, de Graaff, & Canto (2011) note that aspects of this ability were instrumental in creating symmetrical relations during exchanges.

'Gender' and 'age' seem to be of lesser importance. After reviewing several studies, Hrastinski (2007, p. 107) proposes that there is no obvious relationship between gender and participation, and this also seems to be the case in SL (see Deutschmann & Panichi 2009a, p. 318, for example). In relation to group size, Palloff and Pratt's (1999) recommend that the ideal group size in synchronous communication is fewer than ten.

In relation to 'learning styles,' there is a very strong emphasis among educators on the

affordances of SL supporting collaborative, student-centred social learning (see above), and it is reasonable to assume that learners who have little experience of this type of set-up will be less favourable towards SL. This will be discussed further under learner attitudes below.

Under the second category, 'Behavioural factors,' Hrastinski lists three factors of particular relevance to this learning context: 'student attitudes,' 'teaching strategies and tasks,' and 'sense of community.' Student attitudes towards SL are discussed as a factor affecting participation both negatively and positively in several studies. For instance, some learners find the environment too game-like and inappropriate for serious learning events (Ballou, 2009, p. 68; Deutschmann & Panichi, 2009b, p. 33; Gamage, Tretiakov, & Crump, 2011, p. 2411). Other studies have noted that SL as an environment is seen as 'fun' and 'engaging' and motivates active participation (Peterson, 2010, 2012a; Jauregi, de Graaff, & Canto, 2011). Preferences here are clearly very individual, but relevant when analysing participation.

'Teaching strategies and tasks' seem to be of particular importance in language learning in SL. Student-centred, open-ended collaborative tasks as enhancing participation are advocated by Deutschmann *et al.* (2009, p. 208), because "learners are encouraged to take on active roles and situate themselves within the group of learners." Jauregi, Canto *et al.* (2011, p. 90) were able to show that tasks where "communication exchanges [were] triggered by the in-world situation" were particularly successful. Participants reported that "action-related, context-specific, and unpredictable situation[s] in which general spontaneous talk is generated" (p. 90) added value to the learning environment. Interestingly, however, the same authors also found that "SL-specific tasks," such as exploring virtual worlds together while exchanging information, triggered quite large episodes of silence, while other tasks, where the design was less reliant on SL (open discussions for example) were richer in communication. This suggests that while the visually engaging environment of SL can act as a trigger for active participation, it is also important to be aware of the danger of an overload of impressions, which can draw attention away from the central learning aim. Taking the learning contexts of the different groups participating in a telecollaboration into consideration when designing tasks also seems to be of importance, as illustrated in a study by Deutschmann (2011) on a SL language-learning collaboration between four universities. Not doing so might mean that participants become unmotivated since they do not experience the activities as relevant for their academic pursuits.

How SL supports the last of the variables listed under 'Behavioural factors,' 'sense of community,' is omnipresent in almost all publications on education in SL, and has been discussed above.

As regards the variable 'teaching strategies,' Deutschmann and Panichi (2009a) point to the role of the teacher in facilitating and coordinating conversations in the early stages of a course so that all participants are encouraged to become active. Further, back-channelling and other ways of signalling active listening are especially important to encourage participation in SL, where facial expressions and body language are missing. The importance of the instructor coordinating the language learning event is also pointed out by Wang, Song, Xia, & Yan, (2009, p. 14), who further claim that "the instructor's presence helps students avoid 'just another game' mentality when they use SL for EFL learning."

In relation to behavioural factors, personality traits, or more specifically introversion/extraversion seem to be relevant to participation in SL. There is, for example, ample anecdotal evidence that shy students behave more actively in SL due to the relative anonymity offered by the environment (Deutschmann *et al.*, 2009; Gamage *et al.*, 2011; Jauregi, Canto

et al., 2011; Peterson, 2012b), and this is further confirmed empirically by Wehner, Gump, and Downey (2011, p. 285).

Under the category 'Contextual factors' in Hrastinski's model we deem 'accessibility of media' to be the most relevant in SL language learning contexts. Based on a review of a number of SL studies, Inman, Wright, and Hartman (2010) maintain that SL places heavier demands on computers and bandwidth than most other CMC tools used in education, and many course designers point to "strong scaffolding and support" being necessary for SL learning (Salmon, 2009, p. 529). Proposed models include so-called technical initiations (Cooke-Plagwitz, 2008; Jarmon, Traphagan, Mayrath, & Trivedi, 2009; Blasing, 2010; Molka-Danielsen, Panichi, & Deutschmann, 2010), and some also recommend the presence of technical support during the course (Mayrath *et al.*, 2009; Wang, Song, Stone, & Yan, 2009). In spite of such efforts, many report on voice-issues and technical hitches disrupting participation in SL (Wang, Song, Xia, & Yan, 2009; Jauregi, de Graaff, & Canto, 2011), and Mayrath *et al.* (2009) warn that students may lose interest when the technology works poorly and when they have to spend too much time learning new skills.

The list of findings listed above is by no means exhaustive, but helps to illustrate some the complexities of trying to elucidate what decides whether students participate in a learning event or not. The factors that have been mentioned in relation to Hrastinski's model (2007) are of particular relevance to this study, and one of our ambitions is to develop his model to illustrate participation in virtual world environments such as SL.

Research question

Taking Hrastinski's model (2007) as an outline and coupled with various factors affecting participation in multi-user virtual environment identified from previous research, this study aims to answer the following research question:

What factors of importance can we identify as affecting participation in cross-cultural telecollaboration within SL?

Given the limited size of the study, and the complexities of the interplays, we obviously do not claim to be able to provide empirical measures of relative importance of different factors; our ambition is rather to start sketching a model of what may be of interest for future research in this field.

Methods

Participants

The formal educational context for the telecollaborative activities described in this study was a Master's course in English sociolinguistics conducted at a Swedish university. The course had four participants, one of whom was a doctoral student.

In the telecollaborative activities, the Swedish students were joined by primarily Chilean participants who were student teachers of English or English language teachers from the same university. All the Chilean participants were volunteers.[1] There were two more participants: One American man and one Spanish female (a doctoral student), both of whom were experienced users of SL. Only one of the other participants (F_3) had any experience of SL. Table 1 gives an overview of the participants and their various backgrounds and academic positions.

Table 1: Participant background information

	Participant	Gender	Nationality	Academic status	Workshop	Motivation
Students	F1	Female	Swedish	MA student	I, III	Course credit
	F2	Female	Iranian	MA student	I, II, III	Course credit
	F3	Female	Chinese	Doctoral student	I, II, III	Course credit
	F4	Female	South African	MA student	I, II, III	Course credit
Volunteers	F5	Female	Indian	University teacher	I, II, III	Professional skills
	F6	Female	Chilean	University teacher	I, II, III	Professional skills
	M2	Male	Chilean	University teacher	I, II, III	Professional skills
	F7	Female	Chilean	Student teacher	I	Complementary task
	F8	Female	Chilean	Student teacher	I, II	Complementary task
	F9	Female	Chilean	Student teacher	II	Complementary task
	M1	Male	American	University teacher	I	Personal interest
	F10	Female	Spanish	Doctoral student	III	Personal interest

The group was culturally very diverse, covering eight countries in four continents, thus providing good opportunities for discussing language and gender issues from different cultural standpoints.

Design of the study

The use of **SL** for the telecollaborative activities was based on the assumption that it could give an added value to the discussions as the creation of their own avatar would give the participants a meta-perspective on the construction of identity and could allow them to manipulate gender (with the help of *voice-morphing*) if they so wished.

Three task sessions were designed as cross-cultural discussions of language issues with a gender focus. One technical initiation session gave the participants a chance to test their equipment and to get to know the software prior to the telecollaboration. Two technical assistants were always present to help participants with the technical issues. Before each session, background material and some short preparatory points, which entailed reflections on gendered situations and how aspects of gender was expressed through language in their own native culture, were sent out to all participants.

Task sessions 1 and 2 were one-hour discussions whose aims were to let the students "exchange experiences related to language and gender in [their] respective cultures" and "explore and argue beliefs regarding reasons for gender differences in language," respectively. Based on Palloff and Pratt's (1999) recommendations, the participants were divided into two smaller groups during these two sessions.

Task session 3 was formally labelled a "debriefing." During this session, all the participants were encouraged to discuss their impressions of the activities, what had worked and what had not, and potential reasons for this.

Data sources

The data consist of approximately six hours of recordings of the three discussion sessions in **SL**, video recorded with the software Camtasia, with informed consents from the

participants. The recordings were transcribed into two sets of data: voice and chat. The voice set of data was marked with interlocutors' names, the time of utterance (accurate to the second), and notes. The chat set of the data constituted the public chat log from the sessions, which was also marked with avatar names, the time of the utterance, and the number of words. Private chat logs were excluded. Based on the voice data, utterance length, utterance turns, the length of pauses, and the utterances relating to technical problems were calculated.

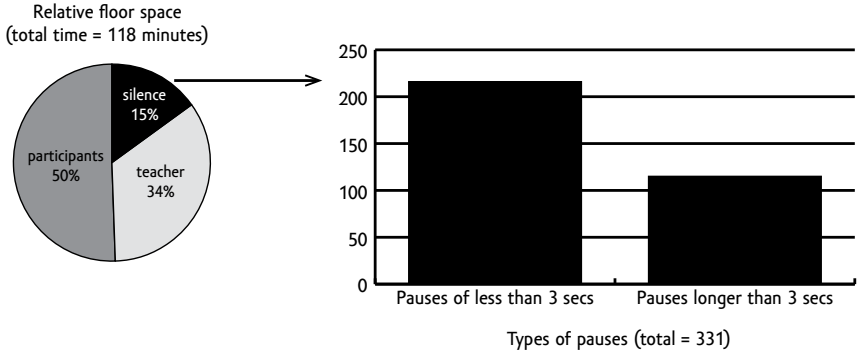
At the end of the final session in **SL**, participants were asked to complete an online questionnaire.[2] The questionnaire covered personal information, as well as evaluations of factors such as engagement, technical issues in **SL**, language proficiency, personalities, relationship to other participants and the teacher, and cross-cultural communicative issues. It had both open and closed questions types. The data from the questionnaire were analysed to find further evidence on what factors have affected participants' performance in-world. In addition, our observations during the sessions complement the data sets, as two of the researchers were present during each session.

Results

Participation

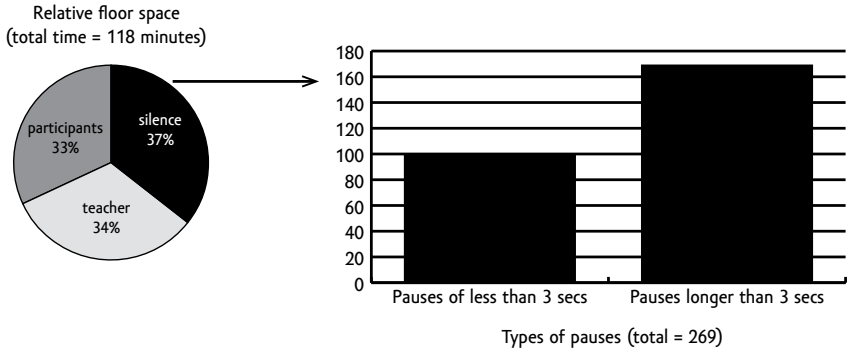
Overall description of the recorded tasks in terms of participation. As described above the activity consisted of three tasks. Here we give an overview of them based on our observations.

In Task 1, participants, with the exception of F1 and M1, relied heavily on the teacher coordinating the conversations, taking few initiatives of their own such as posing follow-up questions or commenting each other. There were several technical disruptions during the conversation, primarily resulting from sound issues. The overall participation for the Task 1 sessions is summarised in Figures 2a and 2b below. Note that in accordance with McLaughlin and Cody's (1982, p. 301) study, pauses of three seconds or more were deemed long enough to affect the conversational structure significantly and thus noted separately



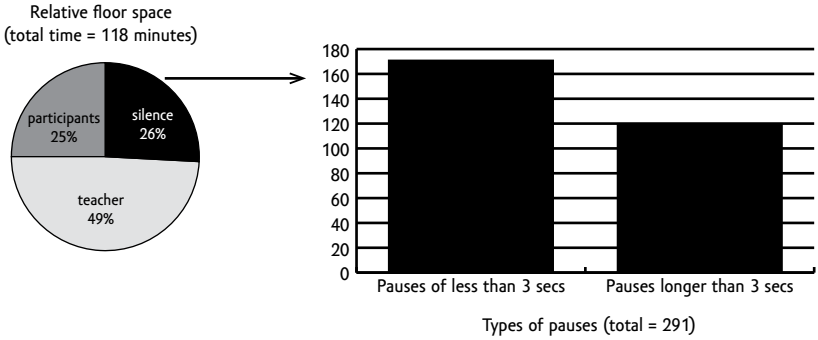
Figures 2a and 2b. Floor space data from Task 1 sessions (average pause length = 3 sec., longest pause = 46 sec.)

In Task 2, the teacher took a more unobtrusive role and the participants were encouraged to take the conversational responsibility. As teachers, we experienced this task as awkward. There were several long silences when participants did not respond or pick up on topics, and active participants such as F2 and F3 ended up taking the role of conversational coordinators. A number of technical hitches occurred during the group sessions. A few participants such as F8 had problems with sound, and in addition SL actually shut down the region we were working from in the middle of the task, causing additional disruptions, as we had to find new locations. It should be noted that students actually held less floor space than in the previous teacher-led tasks, and the teacher occupied far more than intended, a consequence of introducing the task and dealing with technical issues (see Figures 3a and 3b below).



Figures 3a and 3b. Floor space data from Task 2 sessions
(average pause length=12 sec., longest pause = 1 min. 59 sec.)

In Task 3, technology worked reasonably well except for two participants, F3, whose voice was of such bad quality that she only contributed minimally, and F10 who could only contribute using chat. The longer time occupied by the teacher during this task was largely a result of the first half of the session being more of a lecture-type format (see Figures 4a and 4b below).



Figures 4a and 4b. Floor space data from Task 3 session
(average pause length=4.5 sec., longest pause = 1 min. 4 sec.)

Voice participation. When presenting oral participation, we have decided to combine the data from all the three tasks since this gives a more complete view of each participant's performance during the course as a whole. Since not all participants were present during all tasks, participation is ranked on the basis of average floor time per task.

Table 2: Voice participation in all tasks – average floor time per task

Participant	Tasks attended	Total number of utterances	Total floor time	Average number of utterances per task	Average utterance length (seconds)	Average floor time per task (minutes)	Rank
F1 (Sw-MS)*	2	37	20.29	18.50	33	10.14	1
M1 (US-T)	1	12	10.02	12.00	50	10.02	2
F2 (Sw-MS)	3	56	26.12	18.67	28	08.44	3
F3 (Sw-DS)	3	70	17.15	23.33	15	05.45	4
F4 (Sw-MS)	3	23	14.10	7.67	37	04.43	5
F5 (Ch-T)	3	43	12.32	14.33	17	04.10	6
F6 (Ch-T)	3	33	09.28	11.00	17	03.09	7
F7 (Ch-ST)	1	12	03.06	12.00	16	03.06	8
M2 (Ch-T)	3	24	08.26	8.00	21	02.48	9
F8 (Ch-ST)	2	15	03.23	7.50	14	01.41	10
F9 (Ch-ST)	1	10	01.29	10.00	9	01.29	11
F10 (ES-PS)	1	0	0	0	0	0	12

* Sw = From Swedish institution; US = From United States; Ch = From Chilean institution; ES = From Spain; MS = Master's Student; T = Teacher; DS = Doctoral Student; ST = Student Teacher

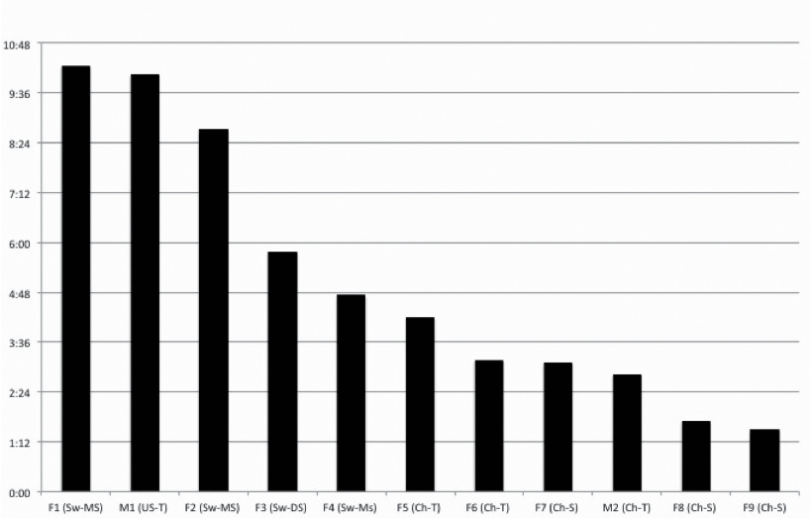


Figure 5. Average floor space per attended task

There is great variation in how much participants spoke during the tasks. Overall, the participants from the Swedish institution and M1, tended to be more active than those from Chile. In this latter group, the professional teachers attended all the tasks (F5, F6 and M2) and generally occupied more floor space per task than the student teachers (F7, F8 and F9), who were also absent for many of the sessions. There is also a difference between the participant groups as regards to utterance length. With the exception of F3, all the participants from the Swedish institution produced longer utterances, on average nearly twice as long as their Chilean counterparts. In brief, we can thus distinguish three distinct groups in relation to oral participation: the active Swedish students, the fairly active Chilean teachers and the less active Chilean student teachers.

Chat participation. Just as for the oral participation, we decided to include chat data from all the three tasks. We have ranked the participants on the basis of the average number of words produced in the chat per task in the same manner as for oral participation.

Table 3: Chat participation in all tasks

Participant	Tasks attended	Total number of chat turns	Total words in chat	Average turn length (words)	Average number of chat turns per task	Average number of words in chat per task	Rank (Rank oral)
F10 (ES-PS)*	1	31	168	5.4	31	168	1 (12)
M1 (US-T)	1	18	92	5.1	18	92	2 (2)
F5 (Ch-T)	3	69	275	4.0	23	91.7	3 (6)
F8 (Ch-ST)	2	40	150	3.8	20	75	4 (10)
F9 (Ch-ST)	1	17	70	4.1	17	70	5 (11)
F3 (Sw-DS)	3	43	198	4.6	14.3	66	6 (4)
F7 (Ch-ST)	1	10	65	6.5	10	65	7 (8)
F6 (Ch-T)	3	23	104	4.5	7.7	34.7	8 (7)
F4 (Sw-MS)	3	17	97	5.7	5.7	32.3	9 (5)
F2 (Sw-MS)	3	32	68	2.1	10.7	22.7	11 (3)
M2 (Ch-T)	3	25	81	3.2	8.3	27	10 (9)
F1 (Sw-MS)	2	0	0	0	0	0	12 (1)

* Sw = From Swedish institution; US = From United States; Ch = From Chilean institution; ES = From Spain; MS = Master's Student; T = Teacher; DS = Doctoral Student; ST = Student Teacher

Interestingly, the results from the chat participation differ markedly from the oral participation. In fact, there is a negative correlation of –0.43, approaching significance ($p = 0.079$ using a one-tailed Spearman Rank Test). This shows a tendency for those participants who were very active orally to be less active in the chat and vice versa, obviously the case for participant F10, whose only means of communication was the chat. On the whole the chat messages were very short, consisting of approximately 4–5 words only.

Factors affecting participation

The results in this section are based primarily on the analysis of questionnaire data, but also include closer analysis of the recordings and our own observations of the activities as coordinators. The factors discussed include task design and motivation, engagement of the participants and the relevance of the task design, the role of the teacher in encouraging participants' participation, technological issues, and various factors related to the different individual prerequisites of the participants, such as their written and spoken proficiency, their personalities (extravert vs. introvert), their previous experience of cross-cultural communication, their roles in the collaboration and how this affected their perceived power, which in turn may have affected their performance.

Task-related behavioural aspects. When asked how familiar (1–6) participants were with student-monitored tasks as opposed to teacher-monitored ones, the "Swedish" participants indicated that they were only slightly less familiar with the former type (4.75 vs. 5.75), while the "Chilean" participants indicated that they were relatively unfamiliar with this way of working (3.25 vs. 5.75). There may, accordingly, have been cultural differences in learning styles between the two groups, where the "Swedish" participants' greater familiarity with student-centred tasks could have facilitated their active participation.

Two questions in the questionnaire related to engagement. First, the participants were asked to estimate their engagement in the topic discussed (language and gender) and here they indicated that they were very engaged (an average score of 5.5 out of 6). Then the participants were asked to rate more specifically how engaged they were in the actual activities of the project and here the score was marginally lower (5/6). When viewing the comments that the respondents made in this section it seems that it was the technology and the virtual environment itself which made some of them give this aspect of engagement a lower score: "I was very engaged but had some problems with audio and voice in the virtual environment"; "Virtual world is not my cup of tea, too unreal to mobilise interest. The topics, although interesting, are drowned in the unreal world." Irritation with the technology/the environment may thus have affected engagement negatively, and ultimately made participants less active.

The tasks were designed primarily with the Master's students and their course in mind. The initial ambition was to create joint tasks with the Chilean university but when this failed we simply had to ask them for volunteers to join our course structure. The unequal position of participants in terms of reward may very likely have contributed to the more active "Swedish" participants. For them a course grade hinged on their active participation whereas this was not the case for the volunteers. The need to take the individual partners course goals into account in the task design in order to achieve a successful telecollaborative activity has been underlined previously (see O' Dowd & Ritter, 2006 and Deutschmann, 2011, for example) and our results corroborate these findings.

Teacher-related behavioural aspects. Somewhat paradoxically, the participants were actually less active when they had to coordinate their own discussion. In the teacher-led tasks, the participants occupied approximately 60/118 minutes of floor space and produced 456 words in the chat. In comparison, they occupied 39/118 minutes of floor space but were approximately equally active in the chat (473 words) when they had to coordinate the conversations themselves.

Below we consider how individual performances differed between the two tasks (see Tables 4 and 5). It should be noted that we only include the results of those participants who were present during both Task 1 and 2.

Table 4: Voice and chat participation during the teacher-led discussion

Participant	Number of utterances	Total time (minutes)	Average turn-length (seconds)	Rank of total time	Chat turns	Total words	Rank of total words in chat
F2 (Sw-MS) *	11	8.41	47	1	6	13	6
F3 (Sw-DS)	24	6.08	15	2	12	88	1
M2 (Ch-T)	17	5.26	19	3	11	27	5
F6 (Ch-T)	10	5.10	31	4	5	12	7
F4 (Sw-MS)	9	4.16	28	5	5	56	2
F5 (Ch-T)	7	3.10	27	6	12	48	4
F8 (Ch-ST)	5	1.16	15	7	18	55	3

Table 5: Voice and chat participation during the participant-led discussion

Participant	Number of utterances	Total time (minutes)	Average turn-length (seconds)	Rank of total time	Chat turns	Total words	Rank of total words in chat
F2 (Sw-MS)*	39	13.01	20	1	15	35	6
F3 (Sw-DS)	32	10.10	19	2	23	68	3
F5 (Ch-T)	20	4.58	15	3	19	68	4
F4 (Sw-MS)	8	4.39	35	4	3	15	7
F8 (Ch-ST)	10	2.07	13	5	22	95	1
F6 (Ch-T)	12	1.32	8	6	11	82	2
M2 (Ch-T)	1	0.56	56	7	10	40	5

* Sw = From Swedish institution; US = From United States; Ch = From Chilean institution; ES = From Spain; MS = Master's Student; T = Teacher; DS = Doctoral Student; ST = Student Teacher

While the mean floor space for the investigated participants during the two task designs were fairly similar (around 5 minutes), the standard deviation was much higher for the student-led task. In this task design, there was an overall tendency for high performers (F2 and F3 in particular) to be more active, while quieter participants (M2 and F6 in particular) were less active than in the teacher-led task (see Figure 6 below). The presence of the teacher thus seems to have had a balancing effect between talkative and quieter participants (c.f. Deutschmann & Panichi, 2009a). The same effects were not apparent in the chat activity.

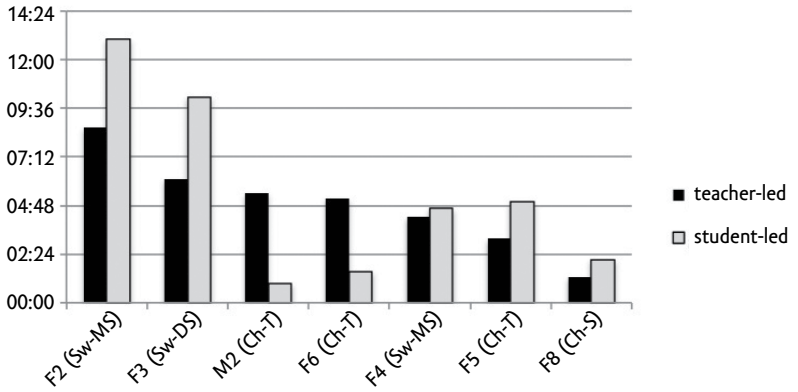


Figure 6. Participant floor space (in minutes) during the teacher-led and participant-led tasks

Context-related technological aspects. The technological complexity of the learning environment (**SL**), as well as frequent technological hitches probably affected participation negatively. We would like to point to several specific issues that affected participation negatively.

There were recurring problems with the quality of sound that disrupted the discussions. These included volume levels being too high or too low and participants finding it difficult to know how to adjust these settings. We also had problems with echo effects and background noise, mainly a result of some participants not having headsets, but also because **SL** settings were incorrect so that the in-built microphone rather than the headset was used as sound source. Moreover, we had problems with sound breaking up, probably because of bandwidth issues. Finally, one participant, F10, was unable to activate sound despite numerous attempts.

The technological complexity of **SL** was clearly reflected in the questionnaire data. Two out of ten participants thought **SL** was quite confusing and two other participants pointed out that the software affected their participation negatively. One participant maintained: "I think I could have spoken more, it was just because of the circumstances of speaking at the university's hall and the audio problem that make me be a lot in silence [sic.]."

The frequent technological hitches outside our control also affected participation negatively. On three occasions, and without prior warning except for five minutes, Linden Lab shut down our regions for maintenance. This caused considerable disruptions since we had to relocate all avatars and re-start our activities.

In order to estimate how much of the discussion time was taken up by solving technological issues, we went through the recordings and noted all voice and chat turns that related to solving such problems; we found this figure to be approximately 20% (140 of 896 voice turns and 194 of 829 chat turns), this in spite of the fact that the tasks were actually preceded by technological introductions, sound checks, and technological support from technical facilitators. The statement: "It was difficult to understand some people because they had problems with **SL**," thus confirms Mayrath *et al.*'s (2009) warning that students may lose interest when the technology works poorly.

Other behavioural and demographic factors. Several questions in the questionnaire addressed individual factors such as proficiency, talkativeness, engagement, previous experience of cross-cultural communication, and perceived roles in the activities (in terms of power, for example).

There were various degrees of proficiency in English among the participants. M1, F4 and F5 for example, were native speakers, while F1 was near-native. The rest can be described as advanced learners at various levels. In Table 6 below we show how the participants' self-evaluations of proficiency levels relate to their relative activity in the course.

Table 6: Self-estimated proficiency levels in relation to task

Participant	Rank voice	Self-estimated oral proficiency (1–6)	Rank chat	Self-estimated written proficiency (1–6)
F1 (Sw-MS)*	1	6	12	6
M1 (US-T)	2	6	2	6
F2 (Sw-MS)	3	4	11	6
F3 (Sw-DS)	4	4	6	4
F4 (Sw-MS)	5	6	9	6
F5 (Ch-T)	6	6	3	6
F6 (Ch-T)	7	5	8	6
F7 (Ch-ST)	8	–	7	–
M2 (Ch-T)	9	5	10	5
F8 (Ch-ST)	10	5	4	5
F9 (Ch-ST)	11	5	5	5
F10 (ES-PS)	12	5	1	5

* Sw = From Swedish institution; US = From United States; Ch = From Chilean institution; ES = From Spain; MS = Master's Student; T = Teacher; DS = Doctoral Student; ST = Student Teacher

Most participants evaluated their written and spoken proficiency as high (5 or 6), except for two of the most active participants (F2 and F3), who actually evaluated themselves as slightly less proficient. Probably because of the participants' reasonable levels of proficiency, we find no direct connection between proficiency levels and activity in this type of course, which essentially discusses meta-linguistic issues. This is also explicitly stated by many of the participants in the questionnaire, where 5 out of 11 participants add comments to the effect that their spoken and written proficiency levels in English had little or no influence on their participation. This is, in our view, a positive answer which adheres to the principles of the communicative language learning approach: given that the task is engaging and that the interchange is perceived as meaningful and authentic, speakers seem to engage regardless of whether they view themselves as 'perfect' speakers of English or not (c.f. Deutschmann & Panichi, 2009a).

We also investigated if there was any correlation between the observed talkativeness in SL and the participants' self-estimated talkativeness in real life (see Table 7). Here F2 and F3, who were comparatively more active in SL, evaluated themselves as less talkative in

real life, which seems to confirm that shy participants may feel less intimidated in virtual learning environments (c.f., Wehner *et al.*, 2011).

Table 7: Observed talkativeness in SL and self-estimated talkativeness in real life

Participant	Rank of observed talkativeness in SL (voice)	Self-estimated talkativeness in real life (1-6)
F1 (Sw-MS)*	1	5
M1 (US-T)	2	–
F2 (Sw-MS)	3	6
F3 (Sw-DS)	4	3
F4 (Sw-MS)	5	2
F5 (Ch-T)	6	6
F6 (Ch-T)	7	2
F7 (Ch-ST)	8	–
M2 (Ch-T)	9	5
F8 (Ch-ST)	10	6
F9 (Ch-ST)	11	5
F10 (ES-PS)	12	6

* Sw = From Swedish institution; US = From United States; Ch = From Chilean institution; ES = From Spain; MS = Master's Student; T = Teacher; DS = Doctoral Student; ST = Student Teacher

We could not find any correlation between participation and the participants' previous experience of cross-cultural communication. All of the participants rated this aspect highly (average of 5) and the following comment perhaps sums it all up: "For the most part, I didn't feel that there were any major cultural differences. This may be because all the participants are a part of a common academic culture that to a certain extent transcends other cultural differences."

The participants were also asked to describe their roles "in relation to other participants" by choosing descriptive words from a list. The popular choices "peer," "friend," "equal," and "colleague" indicate that most of the participants perceived the learning situation as fairly 'equal.' Nevertheless, based on observations of the tasks, we still maintain that there were some fundamental differences in the groupings partaking:

- The participants from the Swedish institution (F1, F2, F3 and F4) were all mature participants attending Master's or PhD programmes. In addition, F1 had long experience as an online language teacher using traditional video-conferencing. They also knew the teacher and the technicians on a face-to-face basis. Furthermore, they had access to computers and technicians.
- The teachers (F5, F6 and M2) from the Chilean institution were all professional foreign language teachers (working at a language centre at the university) and had been encouraged to join the project in order to develop their professional skills in using CMC technology. They had access to private offices and reasonably good computers, even though there was evidence that bandwidth was not always up to scratch.

- The participant teachers from the Chilean institution were all undergraduates and quite young. They had been encouraged to join the project on a voluntary basis as a complementary activity to their programme. They did not have access to institutional computers, or technicians. Nor did they have access to quiet private spaces to work from.

Moreover, M1 was a mature university teacher with long experience in teaching using SL and he joined the project because of his research interests in SL. F10 was a PhD student from Spain with special interest in online teaching and cross-cultural learning.

Based on the above information, we would argue that there was an inherent inequality between the groups. One group in particular, the Chilean student teachers, deserves attention. This group was younger and less experienced and had less favourable technical prerequisites than the rest. Taken together, these factors may have given them a lower position and contributed to their relatively poor participation.

Discussion

In our discussion of the results in this study we take Hrastinski's (2007) model and categorization of factors influencing participation as our starting point. The discussion ends with a suggestion for an expanded model that maps the complexity of SL participation.

Of the 'Demographic factors' identified by Hrastinski (2007), the power relation in terms of education level among participants proved to be of significance in our study. It shows that unbalanced power roles, in our case participants from different academic levels, and with different academic roles, could have a negative influence on participation. Participants with lower academic status contributed less. Although some studies have shown, notably Jauregi, de Graaff, & Canto (2011), that language proficiency could contribute to a skewed power balance, our results are more in line with Deutschmann and Panichi's (2009a) observations, in that proficiency appears not to have affected participation.

A noticeable factor in the study was the comparatively large proportions of silence. In part the lack of participant activity could be explained by technological issues. Silence in itself is not necessarily problematic during a lesson, as pointed out by Reda (2010). Participants have different learning-styles (cf. Gardner, 1983) and silence can be a sign of advanced thinking activities. During our sessions, however, we felt that this was not the case. The design was meant to provide the openness and room for spontaneity that have proven successful in other studies (Deutschmann *et al.*, 2009; Jauregi, Canto *et al.*, 2011), but did not have the desired effect. It became particularly apparent during the participant-led task, in which 63% of the 269 pauses were longer than 3 seconds or more. The reasons are open to speculation. It could be a matter of learning styles linked to an unfamiliarity with student-led tasks among some of the participants (thus ultimately a matter of education), the environment being daunting, or too little social initiation (due to technology taking too much initiation time). The importance of the last-mentioned activities has been emphasised in previous research, but there is always a trade-off to the amount of time a teacher has available.

This leads us over to 'Behavioural factors' such as student attitudes, teaching strategies and task design. As pointed out above, task design appears to be crucial for success in SL, which is also emphasised by Jauregi, Canto *et al.* (2011). Deutschmann's (2011) observation regarding the importance of taking participants' learning contexts into consideration

appears particularly relevant in light of our results. Task design becomes even more important when some participants' rewards are not defined within the course tasks in terms of marks or grades, as was the case for the Chilean participants in the present study.

In terms of personal traits and participation in **SL**, the present study seems to confirm previous studies (Wehner *et al.*, 2011) and speculations (e.g. Peterson 2012b) in that two students who describe themselves as shy are among those who contribute the most.

Of the 'Contextual factors,' technology proved to be crucial factor. Not beginners in **SL**, we were aware of the importance of technical initiation (cf. for example Blasing, 2010), and having assistants (c.f., Mayrath *et al.*, 2009), and we catered for such arrangements. Nevertheless, the issue of technology occupied a substantial part of our sessions. That as much as 16% of voice turns and 23% of chat turns during our three sessions dealt with issues of technology is discouraging. It would be absolutely unacceptable in classroom teaching to devote as much as one fifth of conversational attention and time to issues other than the subject at hand. Participants' evaluation mentioned previously reveals that this issue is important. If anything, the participants' comments seem to underline Mayrath *et al.*'s (2009) warning that too many technological issues will make participants lose interest.

On the basis of our findings, we propose a model dealing with of participation for **SL**, and probably other virtual 3D environments, which builds on Hrastinski's (2007, p. 106), but is in need of some modifications. In particular, it would seem that the medium plays a much bigger role in **SL** than in text tools, functioning as a selective amplifier, which may intensify the impact of certain factors and tone down others. Figure 7 is an attempt to capture the complex networks of factors affecting participation and the impact of the medium.

The role of the medium **SL** can be neutral, positive or negative, which is illustrated by the non-change or change of the size of the arrows. Larger solid lines indicate positive magnified impact, whereas a dashed line implicates negative impact. As we have shown, technology can have a negative impact in that it occupies too much space compared to other media or face-to-face interaction.

The model also highlights how different factors inside the categories identified by Hrastinski (2007) may affect one another. For instance, teaching strategies and task design can affect other behavioural factors, such as talkativeness. Here we would like to point to the important role of the teacher who can potentially affect all three categories. The teacher's presence could be of importance with regard to balancing the power roles that we have found among the students. In motivating and encouraging the students whose rewards for participation were only marginal, the teacher can also affect contextual factors. And, of course, in activating the more silent students, an active teacher can make sure that balanced conversations occur and that the possibly daunting impact of the platform is reduced. The details of these complex networks of factors deserve further research and it is hoped that this study has pointed to some potentially fruitful areas.

Notes

1. Initially a joint project was intended for students with similar course background, but due to various factors, we could not go ahead with that set-up.
2. See https://www.surveymonkey.com/s/TD7XXMQ.

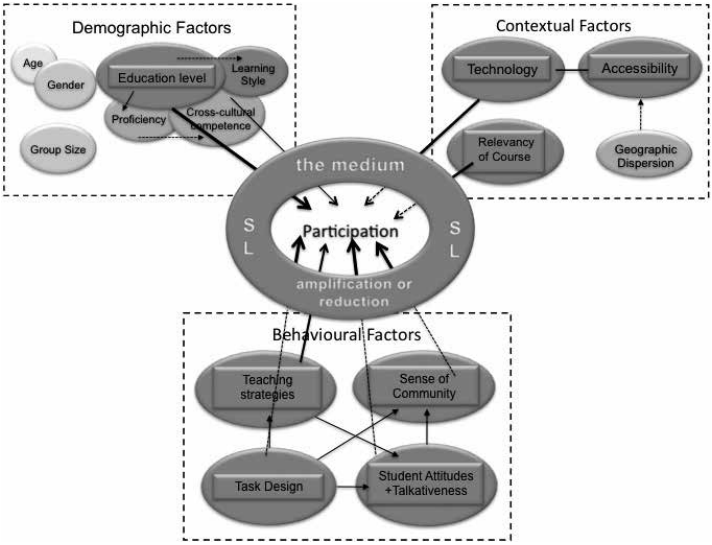


Figure 7. A tentative model of factors affecting participation in cross-cultural telecollaboration in Second Life.

References

Ballou, K. (2009). Language learner experiences in an online virtual world. *The JALT CALL Journal*, 5(2), 61–70.

Blasing, M.T. (2010). Second language in Second Life: Exploring interaction, identity and pedagogical practice in a virtual world. *SEEJ*, *54*(1), 96–117.

Cooke-Plagwitz, J. (2008). New directions in CALL: An objective introduction to Second Life. *CALICO Journal*, *25*(3), 547–557.

Dalgarno, B., & Lee, M. (2010). What are the learning affordances of 3-D virtual environments? *British Journal of Educational Technology*, *41*(1), 10–32.

Deutschmann, M. (2011). Debating across borders. In A.D. Olofsson & J.O. Lindberg (Eds.), *Informed Design of Educational Technologies in Higher Education: Enhanced Learning and Teaching* (pp. 241–269). Hershey PA: IGI Global.

Deutschmann, M., & Panichi L. (2009a). Talking into empty space? Signalling involvement in a virtual language classroom in Second Life. *Language Awareness*, *18*(3), 310–328.

Deutschmann, M., & Panichi L. (2009b). Instructional design, teacher practice and learner autonomy. In J. Molka-Danielse & M. Deutschmann (Eds.), *Learning and Teaching in the Virtual World of Second Life* (pp. 27–44). Trondheim: Tapir Academic Press.

Deutschmann, M., Panichi, L., & Molka-Danielsen, J. (2009). Designing oral participation in Second Life – A comparative study of two language proficiency courses. *ReCALL*, *21*(2), 206–226.

Gamage, V., Tretiakov, A., & Crump, B. (2011). Teacher perceptions of learning affordances of multi-user virtual environments. *Computers & Education*, *57*(4), 2406–2413.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.

Good, J., Howland, K., & Thackray, L. (2008). Problem-based learning spanning real and virtual words: A case study in Second Life. *Research in Learning Technology*, *16*(3), 163–172.

Guth, S., & Helm, F. (Eds.) (2010). *Telecollaboration 2.0*. Bern: Peter Lang **AG**.

Hrastinski, S. (2007). *Participating in synchronous online education*. Lund: School of Economics and Management, Lund University.

Inman, C., Wright, V. H., & Hartman, J. A. (2010). Use of Second Life in K-12 and higher education: A review of research. *Journal of Interactive Online Learning*, *9*(1), 44–63.

Jarmon, L., Traphagan, T., Mayrath, M., & Trivedi, A. (2009). Virtual world teaching, experiential learning, and assessment: An interdisciplinary communication course in Second Life. *Computer & Education*, *53*(1), 169–182.

Jauregi, K., Canto, S., de Graaff, R., Koenraad, T., & Moonen, M. (2011). Verbal interaction in Second Life: Towards a pedagogic framework for task design. *Computer Assisted Language Learning*, *24*(1), 77–101.

Jauregi K., de Graaff, R., & Canto, S. (2011, September). *Integrating cross-cultural interaction through video-communication and virtual worlds in foreign language teaching programs: burden or added value?* Paper presented at the European Computer Assisted Language Learning Conference 2011, Nottingham, **UK**.

Liou, H. C. (2011). The roles of Second Life in a college computer-assisted language learning (**CALL**) course in Taiwan, **ROC**. *Computer Assisted Language Learning*, iFirst article, 1–8.

Mayrath, M. C., Traphagan, T., Heikes, E. J., & Trivedi, A. (2009). Instructional design best practices for Second Life: A case study from a college-level English course. *Interactive Learning Environments*, *19*(2), 125–142.

McLaughlin, M. L., & Cody, M. J. (1982). Awkward silences: Behavioral antecedents and consequences of the conversational lapse. *Human Communication Research*, *8*(4), 299–316.

Molka-Danielsen, J., Panichi, L., & Deutschmann, M. (2010). Reward models for active language learning in 3D virtual worlds. *Proceedings of 2010 the 3rd International Conference on Information Sciences and Interaction Sciences (**ICIS**)*, 40–45.

Moore, M. G., & Kearsley, G. (2011). *Distance Education: A Systems View of Online Learning* (3rd ed.). **USA**: Belmont, Wadsworth Publishing.

O'Dowd, R., & Ritter, M. (2006). Understanding and working with 'failed communication' in telecollaborative exchanges. ***CALICO** Journal*, *23*(3), 623–642.

Palloff, R. M., & Pratt, K. (1999). Building learning communities in cyberspace: Effective strategies for the online classroom. San Francisco: Jossey-Bass.

Peterson, M. (2010). Learner participation patterns and strategy us in Second Life: An exploratory case study. *Re**CALL***, *22*(3), 273–292.

Peterson, M. (2012a). **EFL** learner collaborative interaction in Second Life. *Re**CALL***, *24*(1), 20–39.

Peterson, M. (2012b). Learner interaction in a massively multiplayer online role playing game (**MMORPG**): A sociocultural discourse analysis. *Re**CALL***, *24*(3), 361–380.

Reda, M. M. (2010). What's the problem with quiet students? Anyone? Anyone? *The Chronicle of Higher Education*. Retrieved December 16th, 2012 from http://chronicle.com/article/Whats-the-Problem-With-Quiet/124258/.

Salmon, G. (2009). The future for (second) life and learning. *British Journal of Educational Technology*, *40*(3), 526–538.

Stevens, V. (2006). Second Life in education and language learning. ***TESL-EJ,*** *10*(3). Retrieved March, 2012 from http://tesl-ej.org/ej39/int.html.

Wang, C. X., Song, H., Xia, F., & Yan, Q. (2009). Integrating Second Life into an **EFL** program: Students' perspectives. *Journal of Educational Technology Development and Exchange*, *2*(1), 1–16.

Wang, C. X., Song, H., Stone, D. E., & Yan, Q. (2009). Integrating Second Life into an **EFL** program in China: Research collaboration across the continents. *TechTrends*, *53*(6), 14–19.

Warburton, S. (2009). Second Life in higher education: Assessing the potential for and barriers to deploying virtual worlds in learning and teaching. *British Journal of Educational Technology*, *40*(3), 414–426.

Wehner, A. K., Gump, A. W., & Downey, S. (2011). The effects of Second Life on the motivation of undergraduate students learning a foreign language. *Computer Assisted Language Learning*, *24*(3), 277–289.

Author biodata

Airong Wang, doctoral student, specializes in English Didactics at Mid Sweden University, Sweden. She is interested in cross-cultural language telecollaboration in multi-user virtual environments especially factors affecting participation.

Mats Deutschmann, PhD, is Associate Professor in Language Didactics at the Department of Language Studies, Umeå University, Sweden. He has over ten years' experience in the field of online language learning and over the past five years he has worked extensively in virtual worlds.

Anders Steinvall, PhD, is Senior Lecturer in English Linguistics at the Department of Language Studies, Umeå University, Sweden. He is an experienced teacher of online language courses and has worked with **CALL** for more than 15 years.