

Virtual Worlds in Language Education

Mark Peterson

Kyoto University, Japan

M.Peterson@fx8.ecs.kyoto-u.ac.jp

Developments in computer-mediated communication (CMC) technologies provide both practitioners and learners with access to robust and accessible tools, which have made various types of real time computer-mediated communication (CMC) a practical reality. Of these CMC technologies, the emergence of desktop 3D virtual worlds brings forth new opportunities for educators to shape online learning in the 21st century. These dynamic environments have been increasingly utilized across learning domains. However, in the field of second language education, the use of these tools has only recently attracted significant interest. This article explores how a type of 3D virtual world known as Active Worlds¹, has been utilized by researchers in computer assisted language learning (CALL). This article provides an overview of the key features of the environment and examines research on the use of virtual worlds in CALL. Findings from student-based experimental studies involving Active Worlds, including two recent projects conducted in Japan, are analyzed. The discussion examines evidence from this emergent body of research, which suggests that Active Worlds is an environment with great potential in CALL, as it brings together learners in an engaging new communication context that appears to foster the types of interaction that play a central role in second language acquisition. This article concludes by identifying promising areas for future research.

The Active Worlds virtual environment

Active Worlds² brings together users for communication and content creation in a desktop virtual world incorporating text chat. A further innovate feature of this environment is that it utilizes avatars: graphical embodiments of individual users within a virtual world (Gerhart, Moore, & Hobbs, 2004). The environment provides users with two levels of access. Guest users are supplied with a generic personalized avatar known as a tourist. However, registered users have the option of creating their own avatars and content. Users can make their avatars display a variety of emotional states such as, for example, joy and some non verbal communication cues (waving) in real time by selecting from a number of buttons in the on-screen tool bar. Active Worlds provides access to user-created virtual spaces known as worlds within the framework of a central world known as the Universe. The Active Worlds Universe consists of a large number of user-created virtual worlds, each of which incorporates a central design metaphor: A screen capture of the central gateway world known as AlphaWorld is shown in Figure 1.

1 Active Worlds may be accessed at the following URL: <http://www.activeworlds.com>

2 In the most recent version of the system, real time voice communication has been made available.



Figure 1. The AlphaWorld gateway world

As may be observed in Figure 1, users can communicate in real time through the use of an onscreen chat window located at the bottom of the interface³. Navigation is achieved by means of either hypertext links or keyboard commands that enable individual avatars to move between virtual worlds, an activity known as teleporting. These features further enable avatars to traverse the virtual geography unique to each individual world. Guidance on movement is provided in the text box located on the right hand side of the screen. Individual users also have the option of selecting between first person and third person views of the environment. As can be seen in figure two, a users' chat is also displayed in real time in the form of speech bubbles emanating from their avatar. This feature is designed to facilitate communication during interaction involving large numbers of users.⁴

The use of environments such as *Active Worlds* in CALL, coupled to the data-recording capacities of computers, presents opportunities to explore the new forms of computer-based communication made possible by virtual worlds (Koenradd, 2008). This article will examine key findings on the use of real-time CMC as an environment for language learning. The discussion will analyze the results of existing research on the use of *Active Worlds* in CALL and identify promising areas for future research.

3 The above screen capture does not represent the default interface setting. In the interest of clarity, the author resized the above interface manually. This procedure was also utilized in Figure 2..

4 Tracking turns during large-scale chat-based communication has been identified as a potential limitation of communication in CMC see discussion in Herring (1999).



Figure 2. An Active Worlds avatar

Research on the use of virtual worlds in CALL

Early research on virtual worlds in CALL has involved investigating the use of various types of chat-based environments such as *Daedalus Interchange*, IRC and MOOs. This research identified several advantages of computer-based communication over face-to-face conversation in non-CMC classrooms. These included enhanced motivation (Kelm, 1992), and more egalitarian participation patterns, particularly on the part of traditionally marginalized groups (Warschauer, Turbee, & Roberts, 1996). Other benefits of network-based interaction include reduced anxiety (Hudson & Bruckman, 2002), due to the removal of many of the social context cues that can inhibit communication, increased linguistic output (Kern, 1995) and autonomy, caused by the student-centered nature of the interaction (Chun, 1994). Researchers have observed that the opportunities provided by CMC to interact with a diverse range of interlocutors often in other countries, can enhance cross-cultural knowledge and the development of intercultural competence (Von Der Emde, Schneider, & Kötter, 2001). From the sociocultural perspective on language development, it has been claimed that the new form of communication made possible by real time CMC presents an ideal learning environment, by facilitating the socially mediated cognitive processes that play a central role in second language acquisition (Warschauer, 2005). Studies on learner interaction in real-time CMC have shown that collaborative dialogue involving meaning negotiation and scaffolding frequently occur. These studies have identified the strategies of peer assistance that facilitate the co-construction of second language output (Darhower, 2002; Kitade, 2000; Lee, 2002).

The emergence of avatar-based virtual worlds such as *Active Worlds* is perceived as enhanc-

ing learning opportunities in a number of ways. The combination of text chat with personal avatars provides learners with access to additional communication channels. For example, avatars can display, in real time, a range of non-verbal communication cues that are difficult to replicate in many other types of real-time CMC. Furthermore, it is claimed that the presence of avatars enhances the sense of immersion, telepresence and copresence experienced by users (Ornberg, 2003; Schroder, 2002). This is held to be a major advantage of avatar-based virtual worlds as research has shown that the presence of these factors enhances communication in multi-user virtual environments (Gerhart, Moore, & Hobbs, 2004). Researchers have recently begun to explore the use of avatar-based virtual worlds in CALL, in a developing body of research that seeks to understand how language acquisition may be fostered through interaction in this novel type of CMC.

Early research on learner interaction in *Active Worlds*

An attempt to investigate the potential of *Active Worlds* in CALL was undertaken by Svensson (2003). In this study, Svensson observed the real-time interaction of native speaker (henceforth NS) and non-native speaker (NNS) subjects. Svensson reported that the presence of personalized avatars appeared to engender a high degree of telepresence. In a further significant finding, he noted the relaxed atmosphere characterized by a highly informal communication register similar to that reported in other types of real time CMC such as MOOs (Peterson, 2001). Svensson also observed that the subjects adapted to the computer-based nature of the interaction and the limitations of their avatars (for example, their lack of facial expressions) through adaptive discourse management strategies. These involved the innovative use of keyboard symbols designed to signal paralinguistic cues and emotional states.

A study reported in Toyoda and Harrison (2002) examined the small group interaction of Japanese language learners based at a University in Australia and Japanese NS subjects based in Japan and the United States. This project was undertaken over a semester. The researchers noted that the subjects' limited computer skills, lack of familiarity with *Active Worlds* and computer-based communication led to a number of problems. The subjects frequently mistyped messages and some subjects (perhaps due to limited proficiency) had difficulty keeping up with the interaction in a timely manner. They therefore made little use of the communication features of their avatars. Furthermore, communication gaps caused by intercultural differences occurred. However, the difficulties experienced by the learners provided occasions for learning. The researchers observed that although communication problems occurred these were frequently overcome through negotiation of meaning, a process thought to play a central role in second language learning (Chapelle, 1998).

Two recent learner-based studies on the use of *Active Worlds* in CALL

The largely positive results of earlier studies, motivated more recent work on the use of *Active Worlds* in CALL. In a pilot study (Peterson, 2005), the chat and avatar-based interaction of 15 undergraduate English language learners during a discussion task was explored. Researcher observations indicated that as the subjects were novice users they encountered some difficulties in dealing with the interface. However, they made use of the communication features of their avatars such as waving to a far greater degree than was reported in previous studies. Data analysis further revealed the use of both interactional and transactional discourse manage-

ment strategies (Brown & Yule 1983) that supported the production of coherent task-focused discourse. Many of these strategies have been identified in the literature on CMC as playing a major role in supporting effective communication in online virtual worlds.

Six types of transactional (information transfer) strategies were identified in the chat transcripts. These included the use of time-saving devices such as abbreviations and acronyms. When communication issues arose the learners utilized clarification requests in order to drive the interaction forward. Frequent use was made of a strategy known as addressivity (Werry, 1996), that is, the explicit naming of an intended message recipient. The subjects made extensive use of interactional strategies designed to establish and maintain inter-personal relationships. Evidence in the transcripts indicated the appropriate use of both positive and negative politeness strategies. Although the majority of strategies represented transfers from first language communication practices and prior classroom experiences, the data also showed the presence of adaptive strategies designed to overcome the design limitations of the avatars used in *Active Worlds*. For example, as has been reported elsewhere (Svensson, 2003), the learners made use of combinations of keyboard symbols to display emotional states. Although there was limited evidence in the data for forms of interaction associated with language acquisition such as the negotiation of meaning, this research established the feasibility of utilizing this environment in a learner-based study and laid the groundwork for a larger scale project.

Peterson (2006) investigated the communication of 24 intermediate level undergraduate learners of English from a variety of first-language backgrounds based at a university in Tokyo. In order to obtain a longitudinal perspective, the project was conducted over 5, 90-minute sessions. As prior research (Peterson, 2005; Toyoda & Harrison, 2002) had shown that learners would benefit from a period of familiarization with the system two orientation sessions were implemented, during which the subjects (who were novice users) were provided with a thorough introduction to the communication and navigation features of the system. Three types of language task were administered: information-gap, decision-making and opinion-exchange. These were used in order to explore the possible influence if any, of task-induced effects. Data collection took place over the remaining three sessions. Four types of data were analyzed: transcripts of the text-chat, researcher observations, field notes and post-study questionnaires. Analysis of the data revealed a number of significant findings.

Observation confirmed the value of instituting the orientation sessions. From the third session onwards, it became apparent that the learners had become remarkably proficient users of the system. The majority of the learners reported that they made frequent use of the communication features of their avatars and that these facilitated the interaction. They also claimed that the ability to navigate was beneficial, as it enabled them to move to less crowded areas where the interaction was easier to follow. In terms of strategy use, analysis of the transcript data revealed the presence of the interactional and transactional discourse management strategies identified in an earlier study (Peterson, 2005).

Transactional strategies were more frequent, with a total of 424 identified compared to 382 interactional strategies. These strategies occurred with greater frequency than in the pilot study. The most common transactional strategy (201) was the use of keyboard symbols designed to display various types of feedback such as intonation, facial expressions and attitude. This represents an interesting finding that draws attention to the limited nature of the feedback provided by the avatars. This innovative strategy use shows one of the ways the subjects adapted to the

computer-based nature of the communication in *Active Worlds*. There was evidence in the data that peer support, involving scaffolding and meaning negotiation occurred. The data showed limited evidence of task-induced effects. Instances of negotiation were most frequent in the decision-making task. However, interaction involving negotiation was infrequent across the data as a whole, accounting for 3.3% of total turns. Several factors may be responsible for this finding. The presence of time-saving strategies that were the second most frequent transactional strategy accounting for 80 instances, suggests that there may have been occasions when the subjects chose not to resolve a communication difficulty in order to keep up with the interaction. Moreover, this finding may, in part, be due to the limited duration of this study and the challenging nature of the information-gap and decision-making tasks.

The most frequent interactional strategy was the use of both positive and negative politeness (277 instances). This finding draws attention to the apparent influence of the context of use and cultural background of the participants (Baym, 1995). Observation of the interaction made it apparent that although a relaxed atmosphere prevailed during the sessions, the subjects were aware that their interaction was being observed. This realization, coupled to the fact that the majority of the subjects (20) were Japanese, a culture in which maintaining status within a peer group is an important influence on communication particularly in an educational setting, doubtless contributed to the frequent use of this strategy.

Learner responses to the post-study questionnaire emphasize the beneficial effects of personalized avatars. A majority of the subjects claimed that the use of a personal avatar enhanced their sense of telepresence within the environment. Moreover, the avatars also appeared for the majority of the respondents, to enhance the sense of copresence experienced. Other responses to the questionnaire emphasized that the use of personalized avatars supported a strong sense of immersion within *Active Worlds* and this enhanced involvement, enjoyment and interest in the interaction. The motivating effect of using avatars was further highlighted by the high degree of participation and engagement observed throughout the project.

Conclusions

The findings of the pioneering studies examined in this article and summarized in table one, draw attention to the urgent need for more research. This discussion draws attention to the need for training, and the limitations of the avatars utilized in *Active Worlds*. Moreover, it has identified a number of promising areas for future learner-based studies. Areas of interest involve the exploration of task-based learning, particularly its relationship to the types of strategy use involved in second language acquisition. Further issues raised by recent research include how prior learning experiences and cultural concerns influence communication in this type of real-time CMC. Other areas of interest focus on how the collaborative interpersonal relationships necessary for effective online communication can be established in avatar-based virtual worlds. Future large-scale research that explores the undoubted potential of *Active Worlds* in CALL, offers the prospect of enhancing understanding of how language development can be fostered in the virtual domain.

Table I. Potential limitations and advantages of learner interaction in Active Worlds: Key findings from research

Limitations	Advantages
Need for training in system use	Personal avatars appear to enhance learners' sense of immersion, presence and copresence
Need for basic computer skills	Opportunities to engage in negotiation of meaning
Communication features of avatars are limited for example, lack of facial expressions	Reduction in the social context cues that can inhibit communication
Interaction management may prove challenging for pre-intermediate learners	Learner-centered interaction
Tasks that are not appropriate to the context of use may fail to stimulate beneficial types of interaction	Opportunities to develop autonomy
In international projects, intercultural communication gaps can occur	Opportunities to develop cross cultural knowledge through interaction with interlocutors from diverse backgrounds
	Opportunities to develop collaborative interpersonal relationships
	Enhanced motivation

References

Baym, N. (1995). The emergence of community in computer-mediated communication. In S. Jones (Ed.), *Cybersociety: Computer-mediated communication and community*, (pp.138–163). Thousand Oaks, CA: Sage.

Brown, G., & Yule, G. (1983). *Discourse analysis*. Cambridge: Cambridge University Press.

Chapelle, C. (1998). Multimedia CALL: Lessons to be learned from research in instructed SLA. *Language Learning & Technology*, 2 (1) 22–34.

Chun, D. (1994). Using computer networks to facilitate the acquisition of interactive competence. *System*, 22 (1), 17–31.

Darhower, M. (2002). Interactional features of synchronous computer-mediated communication in the intermediate L2 class: A sociocultural case study. *CALICO Journal* 19 (2), 249–277.

Gerhart, M., Moore, D., & Hobbs, D. (2004). Embodiment and copresence in collaborative interfaces. *Human-Computer Studies*, 61 (4), 453–480.

Herring, S. C. (1999). Interactional coherence in CMC. *Journal of Computer Mediated Communication*, 4 (4). Retrieved August 2nd, 2008 from: <http://www.ascusc.org/jcmc/vol4/issue4/herring.html>

Hudson, J. M. and Bruckman, A.S. (2002). IRC Francais: The creation of an Internet-based SLA community. *Computer Assisted Language Learning*, 15 (2), 109–134.

- Kelm, O. R. (1992). The use of synchronous computer networks in second language instruction: A preliminary report. *Foreign Language Annals*, 25 (2), 441–545.
- Kern, R. G. (1995). Restructuring classroom interaction with networked computers: Effects on quantity and characteristics of language production. *Modern Language Journal*, 25 (5), 441–454.
- Kitade, K. (2000). L2 learners' discourse and SLA theories in CMC: Collaborative interaction in Internet chat. *Computer Assisted Language Learning*, 13 (2), 143–166.
- Koenradd, T. (2008). How can 3D Virtual Worlds contribute to language education? Focus on the Language Village format. Unpublished manuscript. The Netherlands: Utrecht University of Applied Sciences.
- Lee, L. (2002). Synchronous online exchanges: A study of modification devices on non-native discourse. *System*, 30, 275–288.
- Ornberg, T. (2003). Linguistic presence on the Internet: Communication, worldview and presence in online virtual environments. Masters thesis, Umea University.
- Peterson, M. (2001). MOOs and second language acquisition: Towards a rationale for MOO-based learning. *Computer Assisted Language Learning*, 14 (5), 443–459.
- Peterson, M. (2005). Learning interaction in an avatar-based virtual environment: A preliminary study. *PacCALL Journal*, 1 (1), 29–40. Retrieved August 30th, 2008 from <http://www.paccall.org/Journal/PacCALL-Journal-2005-1-1.html>
- Peterson, M. (2006). Learner interaction management in an avatar and chat-based virtual world. *Computer Assisted Language Learning*, 19 (1), 79–103.
- Schroeder, R. (2002). Social interaction in virtual environments: key issues, common themes, and a framework for research. In R. Schroder (Ed.), *The social life of avatars: Presence and interaction in shared virtual environments* (pp. 1–16). London: Springer.
- Svensson, P. (2003). Virtual worlds as arenas for language learning. In U. Felix (Ed.), *Language learning on-line: Towards best practice* (pp. 123–142). Lisse: Swets & Zeitlinger.
- Toyoda, E., & Harrison, R. (2002). Categorization of text chat communication between learners and native speakers of Japanese. *Language Learning and Technology*, 6 (1), 82–99.
- Von Der Emde, S., Schneider, J., & Kötter, M. (2001). Technically speaking: Transforming language learning through virtual learning environments (MOOs). *The Modern Language Journal*, 85, 211–225.
- Warschauer, M. (2005). Sociocultural perspectives on CALL. In J. Egbert and M. Petrie (Eds.), *CALL research perspectives*, (pp. 41–51). Mahwah, NJ: Lawrence Erlbaum Associates.
- Warschauer, M., Turbee, L., & Roberts, B. (1996). Computer learning networks and student empowerment. *System*, 24, 1–14.
- Werry, C. C. (1996). Linguistic and interactional features of Internet relay chat. In S. Herring (Ed.), *Computer-mediated communication: Linguistic, social, and cross-cultural perspectives* (pp. 47–63). Amsterdam: John Benjamins.

Author Biodata

Mark Peterson received his MSc degree in TESOL & CALL from the University of Stirling, and his PhD in applied linguistics (CALL specialization) from the University of Edinburgh. He is an associate professor at Kyoto University, where he teaches on the graduate program of applied linguistics. Home page: <http://www.users.kudpc.kyoto-u.ac.jp/~t51193/>

Using DynEd and ALC with low-level university freshmen

Ian Brown

Kyushu University, Japan

ianjeffbrown@gmail.com

Aaron P. Campbell

aaronpcampbell@gmail.com

York Weatherford

yorkweatherford@gmail.com

Kyoto Sangyo University, Japan

In this paper we share our experience implementing a CALL project with first year, lower level, non-English major, university students, using two CALL packages popular in Japan: DynEd and ALC. In addition to comparing the pros and cons of both, we will also discuss how the project was launched and how it evolved over time. Implementing commercial CALL software in a classroom setting involved a number of challenges, both technical and pedagogical, necessitating a variety of adaptations to suit the needs of both learners and the institution. Along with describing how changes were made, both in our methods of implementation and how the software was used, we also share our process of dealing with two key issues that arose: student motivation and learner assessment. We hope that by recounting our entire experience with this project, as well as sharing results from a series of student surveys, we will provide ideas for other teachers and faculty departments interested in introducing CALL projects with lower-level students.

Introduction

CALL is increasingly being used in Japanese universities in a variety of ways, from individual teacher efforts to larger, more campus-wide projects similar to the one discussed in this paper. Bingham and Larson (2005, pp. 39–40) attribute the increase in many of the larger projects to reasons ranging from staff cuts and shrinking budgets in Japanese universities to marketing strategies. They go on to say that many of these expensive CALL labs, built as “selling points for school brochures,” are then underused or misused with some simply becoming unintended “independent study centers” rather than the active self-access centers their planners may have envisioned. The educational use of many of these expensive labs has not always been fully explored or exploited.

In their study of e-Learning in Japan, Ozkul and Aoki (2006) support this claim and