

# **Constructing Collaborative Serious Games for Cross-Cultural Learning in a 3D Metaverse**

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This research aims at implementing the platform and framework of collaborative serious games for cross-cultural learning in a 3D metaverse. The term “serious game” has been used to denote a concept of game-based interactions and dialogues for the purposes of education and training. 3D metaverses generally indicate immersive virtual spaces with digitized objects and architectures on the Internet. A controllable virtual character, or avatar, enables the visitors to the spaces to participate in embodied social interaction with other avatars. Therefore, a 3D metaverse as the infrastructure of a serious game has a great potential to be a platform for inheriting and sharing culture and tradition from the perspective of hands-on experience and situational learning.

Firstly, this presentation demonstrates a 3D metaverse designed for Japanese cultural learning that we have constructed in SecondLife (SL). The metaverse embeds a series of pop-up quizzes regarding Japanese culture and customs that are linked to a certain locations or virtual objects. For example, several quizzes about the manner of entering Shinto shrine pop-up in front of the main gate or “Torii” of the shrine. Players can deepen their understanding of Japanese religious custom as they respond to quizzes and refer to explanations followed by the answers.

Second, we propose a learning framework for cross-cultural understanding through collaborative serious games utilizing the metaverse that includes various Japanese cultural assets. The framework emphasizes the context-based interaction between old-timers and newcomers (Lave & Wenger, 1991). It also assumes not only individual playing but also participants’ co-playing (Coyne, et. al, 2011). In the process of serious play, Japanese and non-Japanese players encountered several quizzes regarding Japanese culture and customs. Since the quizzes require in-depth knowledge about Japanese culture and values, they are difficult even for Japanese players to answer. Therefore, both Japanese players and non-Japanese players have to exchange their interpretations from different perspectives, and make up their own replies to the questions. Such discussion enhances cross-cultural understanding among players.

Third, we explain the results of analysis on the interaction and learning process during serious game-based cultural learning inside and outside of SL. Up until now, we have conducted learning experiments with more than 20 pairs of Japanese and non-Japanese

students as research participants. We have analyzed the leaning process from the perspective of distributed cognition (Hollan, Hutchins, & Kirsh, 2000), which investigates embodied social interaction in the data collected by video ethnographic methods. From the analysis, we have observed that Japanese students realized their lack of knowledge in Japanese cultural practice, and then develop more equal and reciprocal interactions with non-Japanese students. In the debriefing sessions, both Japanese and non-Japanese students answered that they could get better understanding of Japanese cultural practices through the co-playing. Some participants also mentioned that the cross-cultural interaction during the game enhanced their awareness of not just the other's culture but their own culture.

At the end of this presentation, we discuss the applicability of our platform and framework to different types of cross-cultural learning such as understanding food culture or pop-culture in the countries where players are from.

## **Keywords**

Serious Game, Collaborative Learning, Situated Learning, Distributed Cognition, Metaverse

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