

# Perceived Sociability and Social Presence in a Collaborative Serious Game

*Kimmo Oksanen, Finnish Institute for Educational Research, University of Jyväskylä,  
Jyväskylä, Finland*

*Raija Hämäläinen, Finnish Institute for Educational Research, University of Jyväskylä,  
Jyväskylä, Finland*

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## ABSTRACT

*Collaborative serious games have proven to have the potential to support joint knowledge construction, and there is a growing interest in applying such games to promote high-level learning. However, most of the existing studies have focused on the effects of functional, task-specific support while ignoring the social aspects of collaborative learning. This study is one aim to fill in the knowledge gap in order to understand how learners experience educational games as a means of social interaction and collaboration. The findings indicated that the game environment facilitated and supported players' socio-emotional processes by eliciting students' social presence and sociability. This has been further shown to play an important role in the emergence of social interaction and collaborative learning. These results can be applied in the design of collaborative educational games that support social aspects of collaborative learning.*

*Keywords: Collaborative Serious Game, Computer-Supported Collaborative Learning, Perceived Sociability, Serious Game Experiences, Social Presence*

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## INTRODUCTION

Future learning challenges us to develop new teaching methods to respond to the increasing demands of society and new learning cultures, particularly as so-called “Net Generation” learners prefer collaborative working methods over individualized learning methods (Valtonen, Pöntinen, Kukkonen, Dillon, Väisänen, & Hacklin, 2011). As such, problem solving, cooperation, and interaction skills are a key part of future

working life skills (Billett, 2008; Hämäläinen & Vähäsantanen, 2011). In addition, different virtual environments and games have become a natural part of the information society (Egenfeldt-Nielsen, 2005). One way to promote a learner's ability to face future challenges is to draw attention to a culture that consciously supports collaborative actions. This requires new forms of working and studying alongside traditional methods. The use of technology to support collaborative learning, i.e., in work

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contexts, CSCW (Computer-Supported Cooperative Work) (Dourish & Bellotti, 1992), and in school contexts, CSCL (Computer-Supported Collaborative Learning) (Koschmann, 1996), has become increasingly essential when attempting to determine how to meet the challenges and needs of future learners (e.g., Wang, 2009; Whitton, 2010). The advantages of using technology have been considered, such as the possibility of working anytime and anywhere, paying attention to learners' common knowledge construction processes, and offering added value to learning in the form of more concrete working environments.

Multiplayer collaborative serious games are one way to use technology to support collaborative learning. Applying collaborative learning (see Crook, 1998; Minnaert, Boekaerts, De Brabander, & Opdenakker, 2011) in game settings can be seen as one of today's innovations. Thus, collaborative learning and shared problem solving are overlapping processes, and in practice, game design may apply knowledge produced in CSCL research. Additionally, collaborative learning (Roschelle & Teasley, 1995; Sawyer, 2007) and joint problem solving in games (Burton & Martin, 2010; Hummel, van Houcke, Nadolski, van der Hiele, Kurvers, & Löhr, 2011) takes place by distributing participants' own thoughts and expertise, by listening to and elaborating on the views of the others, and through the creative and shared knowledge construction of different thoughts and conclusions to reach common goals. Thus, at their best, game tasks encourage creative collaboration that includes elements whereby students need to make choices based on evidence, consider alternative solutions, investigate a variety of clues in different conditions, and explore new and even counterpoint issues before a particular solution can be reached (Reiser, 2004; Ruiz-Primo, Figueroa, & Gluckman, 2011). However, these games are not without certain challenges and should therefore not be seen as

a panacea or a guarantee of the emergence of collaborative learning.

## A GAME AS A SOCIABLE CSCL ENVIRONMENT

Multiplayer games have become increasingly popular in recent years (Steinkuehler, 2006; Kallio, Mäyrä, & Kaipainen, 2011; Yee, 2007). Previous studies have shown that collaborative serious games have the potential to support high-level knowledge construction (e.g., Burton & Martin, 2010; Hummel et al., 2010; Hämäläinen & Oksanen, 2012; Bluemink, Hämäläinen, Manninen, & Järvelä, 2010). In addition, it is generally agreed that the development of games permits ever more diverse ways of designing learning for the future. Two such examples are the demonstration of dangerous situations on construction sites (Hämäläinen, Oksanen & Häkkinen, 2008) and the promotion of global empathy and interest in learning (Bachen, Hernández-Ramos & Raphael, 2012). Thus, there is a growing interest in applying collaborative games to support different types of learning goals (e.g., Silseth, 2012; Whitton, 2010).

Collaborative serious games can be considered a specific sub-category of CSCL environments (Kreijns, Kirschner, Jochems, & van Buuren, 2007). This is supported by the view that to improve the possibility of high-level collaboration occurring, learners' actions need to be guided (Bluemink et al., 2010; Hämäläinen et al., 2008); game design offers many possibilities to do that, for example, in the form of different kinds of task structures and game design strategies (e.g., Dickey, 2005). Kreijns, Kirschner and Jochems (2003) have identified the major pitfalls for social interaction in CSCL environments: the belief in the emergence of social interaction and collaborative activities as long as they are made possible, and the dismissal of the social and psychological dimension of

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