



Do interpersonal skills and interpersonal perceptions predict student learning in CSCL-environments?



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ARTICLE INFO

Article history:

Received 26 October 2015

Received in revised form 25 February 2016

Accepted 26 February 2016

Available online 2 March 2016

Keywords:

Collaborative learning

Computer-mediated communication

Secondary education

Pedagogical issues

Teaching/learning strategies

ABSTRACT

Although Computer-Supported Collaborative Learning (CSCL) is regarded as an effective pedagogical approach, this heavily depends on whether its members function effectively as a group. This study examines whether students' interpersonal skills and students' perceptions of those skills predict individual achievement and group performance in CSCL-environments. In total, 87 secondary education students working in 29 triads collaborated on a collaborative problem-solving task. Students' interpersonal skills and the perception of students' interpersonal skills were conceptualized as *agency* (displaying dominant behavior, e.g., leadership) and *communion* (displaying empathic behavior, e.g., being helpful). Students' interpersonal skills were measured by coding the chat-utterances of the group discussions. Perceptions of interpersonal skills were measured by administering a questionnaire after the group task. Individual achievement was measured by a pre-test and a post-test. Group performance was measured by coding the quality of the problem-solution. Multi-level analysis revealed that, when corrected for pre-test scores, students' agency and communion skill positively predict their individual achievement. Multiple regression analysis revealed that the group level scores for collaborative behavior, interpersonal skill perception, and pre-test scores did not significantly predict group performance. The results suggest that students' interpersonal skills significantly predict the degree to which CSCL has an impact student individual achievement.

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1. Introduction

Environments that emphasize collaborative learning mediated by technology are referred to as computer-supported collaborative learning (CSCL) environments (Stahl, Koschmann, & Suthers, 2006). In CSCL-environments, two or more students work together to solve a problem which is assumed to evoke a dynamic process of eliciting one's knowledge, discussing this knowledge with group members, establishing a group understanding of the problem-domain, and applying knowledge to solve the problem (Hmelo-Silver, Duncan, & Chinn, 2007). By doing so, CSCL might stimulate critical thinking and deeper processing of the subject matter, and offer opportunities for developing communicative and social skills (Johnson & Johnson, 2009; Laughlin, Carey, & Kerr, 2008). Although research has shown that collaborative problem solving can be an effective pedagogical approach, this heavily depends on whether its members function effectively as a group (Barron, 2003; Dillenbourg & Traum, 2006; Meslec & Curşeu, 2015). Research on group effectiveness, therefore, has taken an interest in

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examining whether and why certain input variables, such as role division and group composition, predict group learning processes and outcomes (de Wever, van Keer, Schellens, & Valcke, 2007; Janssen, Kirschner, Erkens, Kirschner, & Paas, 2010).

The premise in this study is that groups will not be effective unless they overcome barriers such as free riding, social loafing, and a lack of psychological safety (Järvenoja & Järvelä, 2009; Phielix, Prins, & Kirschner, 2010; Raes, Kyndt, Decuyper, van den Bossche, & Dochy, 2015). Inadequately resolving these interpersonal conflicts negatively affects individual achievement and group performance (Behfar, Mannix, Peterson, & Trochim, 2010; DeDreu & Weingart, 2003). When group members focus on negative emotions towards one other, this makes them more resistant to others' ideas. This hinders students in establishing a proper and shared understanding of the domain, and applying this understanding to the problem at hand (Cheruvilil et al., 2014; Lee, Huh, & Reigeluth, 2015; Linnenbrink-Garcia, Rogat, & Koskey, 2011).

Maintaining positive interpersonal relationships with group members requires the appropriate use of interpersonal skills (Johnson & Johnson, 2009; Notari, Baumgartner, & Herzogt, 2013; Prichard, Stratford, & Bizo, 2006). In management literature, interpersonal skills are often conceptualized in terms of conflict resolution skills, consensual decision-making skills, leadership skills, dialogue and discussion skills, team building skills, and empathic skills (Belbin, 1981; Parker & Hackett, 2012; Peterson, 1997; Wooley, Chabris, Pentland, Hashmi, & Malone, 2010). Whereas this provides insight into the interpersonal skills required to resolve interpersonal conflicts, studies examining which interpersonal skills are most predictive for student learning in CSCL-environments remain scarce (Lee et al., 2015; van den Bossche, Gijssels, Segers, & Kirschner, 2006).

The present study addresses the paucity of research into the relationship between interpersonal relationships and collaborative learning by further conceptualizing the interpersonal skills group members may utilize in CSCL-environments. To this end, we introduce interpersonal relationship theory into the field of CSCL. Interpersonal theory has a firm tradition of 25 years in the field of research on teaching and teacher education. Interpersonal theory describes the interpersonal relationship between teachers and students and its effect on student achievement (Wubbels, Brekelmans, den Brok, Levy, Mainhard, & van Tartwijk, 2012). The conceptualization of teachers' interpersonal skills will be used to develop a research methodology in the field of CSCL. That is, group members' interpersonal skills will not solely be measured in terms of perception (self perception or perception of other group members' skills) but also in terms of displayed interpersonal behavior. By doing so, this study aims to gain more insight into whether interpersonal skills and student interpersonal skill perceptions predict group performance and individual achievement in CSCL-environments.

2. Interpersonal theory applied to CSCL-environments

2.1. Interpersonal theory: interpersonal relationship in classrooms

In interpersonal theory (Bruckmuller & Abele, 2013; Gurtman, 2009; Horowitz & Strack, 2011; Wubbels et al., 2012), teachers' interpersonal skills are often conceptualized in terms of agency and communion. *Agency* suggests that a teacher displays dominant behavior (e.g., taking matters in his or her own hand, and having control of the classroom situation). *Communion* suggests that a teacher displays empathic behavior (e.g., affiliation, friendliness, and love). In line with Notari et al. (2013), Pennings et al. (2014) state that agency and communion skills can be distinguished by examining the

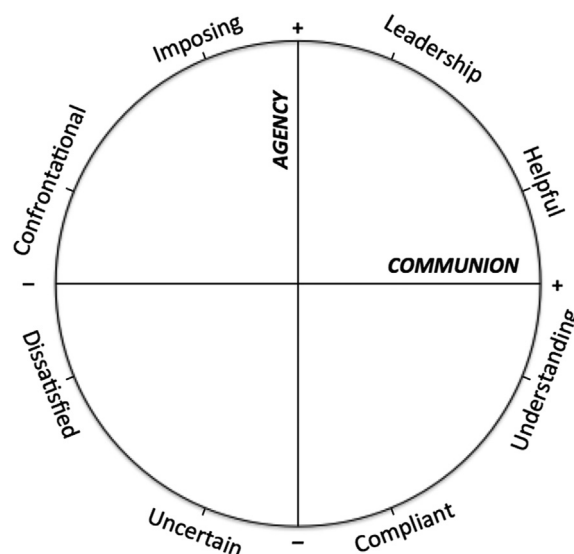


Fig. 1. Teachers' interpersonal skills (adapted from Pennings et al., 2014).

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