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Structuring asynchronous discussion groups: Comparing scripting by assigning roles with regulation by cross-age peer tutors

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Abstract

The present study focuses on comparing the impact of role assignment and cross-age peer tutors on students' level of knowledge construction in 15 asynchronous discussion groups of nine students each in a first-year university course ($N = 135$). Content analysis was applied to analyse the level of knowledge construction in students' online postings. The results indicated that students in the tutor-supported discussions reached significantly higher levels of knowledge construction as compared to students in the role-supported group. These findings underline the value of regulation by cross-age peer tutors to foster freshmen's knowledge construction processes.

Keywords: Role assignment; Peer tutoring; Content analysis; Asynchronous discussion groups; Computer-supported collaborative learning (CSCL)

1. Introduction

The present study fits in with the search for instructional approaches to stimulate knowledge construction through social negotiation in online asynchronous discussions. The study was situated in the context of a blended first-year course on Instructional Sciences, in which 27 discussion groups of nine students each were organised to foster students' processing of the learning content. Five discussion assignments were presented to the groups in order to stimulate debate on theoretical concepts presented in the face-to-face sessions and course manual. An example of a discussion assignment can be found in Appendix A. In order to promote knowledge construction through social negotiation, two structuring approaches were introduced: one assigning different roles to the students and the other assigning a fourth-year peer tutor to each discussion group. The main aim of the study was to compare the impact of both structuring approaches on students' level of knowledge construction in asynchronous discussion groups.

1.1. Learning environments

The theoretical foundations for the design, development, and implementation of computer-supported learning (CSCL) environments are often based on constructivist principles. Constructivism and electronic learning environments go hand in hand. Kirschner (2001, p. 1) even argued that "the future (and even the today) of learning is constructivist design and development of collaborative and cooperative learning situations in powerful integrated electronic environments". Social constructivism does not only assume that knowledge is actively constructed by the learner, it also emphasises the socially and culturally situated context in which learning takes place (Duffy & Cunningham, 1996). Social knowledge construction is thus seen as a collaborative process where meaning is negotiated from multiple perspectives (Merrill, 1991).

In the present study, asynchronous online discussions were introduced as a CSCL-environment. Rourke and Anderson (2002, p. 3) argue that discussion is an excellent activity for supporting the co-construction of knowledge, since explaining, elaborating, and defending one's position to others "forces

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learners to integrate and elaborate knowledge in ways that facilitate higher-order learning''. Gilbert and Dabbagh (2005, p. 6) claim that ''an important instructional benefit of asynchronous communication is its potential to support the co-construction of knowledge''. In these learning environments, students can work together, achieve shared understanding, and collaboratively solve problems (Cecez-Kecmanovic & Webb, 2000).

However, simply grouping individual students in asynchronous discussion groups does not necessarily bring about effective interaction or collaborative learning (Weinberger, Reiserer, Ertl, Fischer, & Mandl, 2005). Therefore, educational researchers and practitioners continue to explore instructional approaches in online learning environments in order to guide and improve collaboration processes and thus collaborative learning. This can, for instance, be done by scripting or by regulating the discussions (Dillenbourg, 2002), since providing structure by means of scripts or regulation can be seen as a form of scaffolding for students to get started in authentic activities. In this study, we opted for one specific type of scripting, the assignment of different roles to group members. Regulating the discussions, on the other hand, was realised by assigning a cross-age peer tutor to the discussion groups.

1.2. Role support versus peer tutor support

A script (the term is actually borrowed from the theatre world) specifies the roles and the nature and timing of the activities of the participants (O'Donnell & Dansereau, 1992). In this respect, a script can be considered as a more or less rigid scheme according to which the collaboration proceeds (Pfister & Mühlpfordt, 2002). The assignment of roles is a scripting approach that has been used and proven successful in online discussion environments (De Wever, Schellens, Van Keer, & Valcke, 2008; Schellens, Van Keer, & Valcke, 2005; Strijbos, Martens, Jochems, & Broers, 2004). Previous research (De Wever, Van Keer, Schellens, & Valcke, 2007, 2009; De Wever, Van Winckel, & Valcke, 2008; Schellens & Valcke, 2006) showed that scripting by assigning roles enhances social knowledge construction in asynchronous discussions. De Wever, Van Keer, Schellens, & Valcke (submitted for publication) found that role assignment was even favourable for students without roles in role-supported groups. The present study focuses on comparing this instructional approach with regulating by peer tutors. Although peer tutoring is not new in online discussion environments (see, e.g., McLuckie & Topping, 2004; Van Rosmalen, Sloep, Kester, et al., 2008), the impact of assigning peer tutors on the social knowledge construction in the discussion groups has not been studied.

In the present study, both structuring approaches were used to improve collaborative knowledge construction. The main difference between both approaches is that the roles are a priori assigned to the students. This type of scripting is not flexible: before the onset of the discussions, students are assigned a role and these roles do not change during the discussions, irrespective of the ongoing collaboration processes. Supporting the asynchronous discussion groups by introducing a cross-age peer tutor on the other hand is a more flexible way of structuring the learning environment, since tutors can regulate their own and indirectly also the tutees' discussion behaviour based on the collaborative processes students are engaged in. In this respect, regulation by peer tutors fits in with the recent view of Pata, Sarapuu, and Lehtinen (2005) on scaffolding, emphasising that scaffolding means providing assistance to students on an as-needed basis with fading out of assistance as competence or mastery increases.

1.3. Roles as scripting tools

Roles are assigned to participants in order to support the process of social negotiation in the asynchronous discussion groups. Roles are seen as important factors in determining the quality of knowledge construction in a community (Aviv, Erlich, & Ravid, 2003). They compel students to focus upon their responsibilities in the discussion group and on the content of their contributions. Furthermore, research revealed that roles appear to increase students' awareness of collaboration and elicit more task content statements (Strijbos et al., 2004).

Instructional collaborative learning approaches focus on assigning roles to students in order to support coordination and promote effective interaction patterns. A number of positive effects are attributed to roles. Groups are expected to work efficiently, smoothly, and productively (Cohen, 1994) and ''the practical matter of having critical roles filled in meetings has direct implications for improving task performance and satisfaction'' (Zigurs & Kozar, 1994, p. 277). Furthermore, the use of roles can alleviate problems of nonparticipation or domination of the interaction by one group member (Cohen, 1994). In the present study four roles were assigned to students, that is, the role of (a) moderator, (b) summariser, (c) theoretician, and (d) source searcher.

The role of the *moderator* consists of starting off the discussion, monitoring the discussion, asking critical questions, inquiring for others' opinions, adding new points upon which other students can build, and giving new impulses every time the discussion slacks off. This role is partially based on the starter role of the starter–wrapper technique as reported by Hara, Bonk, and Angeli (2000). In the Hara et al. (2000) study, the starter was to initiate the discussion by asking questions related to specific readings, and the wrapper summarized the discussion on the readings for the week. The moderator role is also based on the topic leader role (Tagg, 1994). The topic leader was responsible for submitting an initial introductory exercise contribution and appeared to serve a vital contextualizing function in moderating conferences (Tagg, 1994). According to Gray (2004), a moderator role is critical for enhanced learning in online contexts.

The *summariser* is expected to post interim summaries during the discussion and a final synopsis at the end. This role is based on the wrapper role (Hara et al., 2000) and the topic