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Blending Facebook discussions into seminars for practicing argumentation

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ABSTRACT

Social media like Facebook can blend classroom work with collaborative online learning. Different instructional approaches may support such online learning phases. Group awareness tools provide collaborating learners with additional information about the processes and the knowledge in the group and how these are distributed within a group to support the regulation of learning. Scripts are a form of external regulation of collaborative learning processes. Scripts may complement group awareness tools and promote active processing of the additional group information. In a 1×3 (group awareness tool with script vs. without script, and control group) quasi-experimental field study ($N = 63$) we observed long-term effects of a group awareness tool and its combination with a script on processes and outcomes of argumentative learning in a seminar accompanied by Facebook discussions. In addition to domain-specific learning outcomes, this study explores attitude change as a potential outcome of prolonged periods of argumentative knowledge construction. Results showed a main effect of group awareness tools on declarative knowledge, but no significant effects on argumentative knowledge. Participants with group awareness tool (with script vs. without) attained an attitude which aligned with the learning goals. This attitude change partly correlates with the significantly higher learning outcomes on declarative knowledge.

1. Learning and SNS

SNS[1] have become popular communication platforms, in which users build personal profiles and connect to their own circle of peers (Geocartography Knowledge Group, 2011; Rideout, Foehr, & Roberts, 2010). There is interest in leveraging SNS for collaborative learning, e.g. by using Facebook groups to support activities beyond classroom time (Forkosh-Baruch & Hershkovitz, 2011; Greenhow, 2008; Greenhow, Menzer, & Gibbins, 2012; Madge, Meek, Wellens, & Hooley, 2009; Wodzicki, Schwämmlein, & Moskaliuk, 2012). Apps could be purposefully designed to scaffold collaborative learning in SNS independent of teacher support. Despite this potential of SNS, there is yet little knowledge on how to design support for collaborative learning in SNS. So far, scientific understanding of scaffolding CSCL[2] has been derived from lab studies using online discussion boards for experimental purposes. Field studies in widely used SNS such as Facebook may show differential effects of scaffolding on social interactions and learning (Tsovaltzi, Judele, Puhl, & Weinberger, 2015; Tsovaltzi, Puhl, Judele, & Weinberger, 2014).

Collaborative learning is currently being revisited from the perspective of learners co-constructing arguments, aligning their opinions and attitudes in their respective social contexts (Andriessen, 2006; Asterhan, & Schwarz, 2007; Baker, 2003; Tsovaltzi et al., 2014; Wenger, McDermott, & Snyder, 2002). SNS are a new arena for debate that may be designed to foster productive forms of collaborative argumentation. AKC[3] is the deliberate practice of elaborating learning material and discussion topics with the goal to gain argumentative and domain knowledge by constructing formally and semantically sound arguments (Andriessen, 2006; Baker, 2003). Argumentation serves to critically assess information and participate in civic society. In CSCL research, AKC has been investigated with positive results on argument quality, reflective interactions, and long-term conceptual gains (Asterhan & Schwarz, 2007; Baker & Lund, 1997; Marttunen, & Laurinen, 2001; Noroozi, Weinberger, Biemans, Mulder, & Chizari, 2012; Scheuer, Loll, Pinkwart, & McLaren, 2010; Stegmann, Wecker, Weinberger, &

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[1] Social Networking Sites.
[2] Computer Supported Collaborative Learning.
[3] Argumentative Knowledge Construction.

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Fischer 2012; Wecker & Fischer, 2014). However, argumentation skills are often underdeveloped (Felton & Kuhn, 2001; Marttunen & Laurinen, 2001) and AKC is not easily elicited. Formal argumentative knowledge and domain-specific knowledge can be enhanced by supporting discourse interactions during AKC (Andriessen, 2006; Weinberger, Stegmann, & Fischer, 2010).

Fostering AKC in SNS may equally help to further develop already existing processes of sharing and co-creating knowledge. However, can CSCL interaction supports also be expected to be effective for learning in SNS? We investigate group awareness tools and their combination with scripts to promote learning in a seminar accompanied by Facebook group discussions and enhanced through a Facebook App. Through the Facebook App., we offer support to foster productive forms of argumentation that can bring about learning and attitudinal changes.

1.1. Group awareness and group awareness tools

Group awareness is the shared knowledge of different characteristics of group members and aspects of their interactions that collaborating learners need in order to regulate group work (Bodemer, 2011). Such information may comprise, for instance, how knowledge or responsibilities is distributed in a group, and how members are emotionally and motivationally involved in the group (Janssen & Bodemer, 2013). Online learners often lack group awareness due to limitations of computer-mediated communication (Luppicini, 2007). Hence, GATs[4] have been designed to facilitate group awareness by aggregating and visualizing group data to compensate for the lack of physical or conversational cues in CSCL environments (Bodemer & Dehler, 2011; Gutwin & Greenberg, 2002; Gutwin, Greenberg, & Roseman, 1996). GATs may provide additional group information beyond what is possible in face-to-face interaction (Carroll, Rosson, Farooq, & Xiao, 2009). GATs have been used to increase social awareness, which makes group processes or attitudes explicit, for instance by visualizing how learners evaluate their own and their peers' cognitive and social interactions. These GATs facilitated process satisfaction and social performance (Phielix, Prins, Kirschner, Erkens, & Jaspers, 2011). Such social awareness GATs in combination with tools that fostered reflection can also impact socio-emotional and motivational processes like group satisfaction and the attitude to collaboration. Especially awareness of and reflection on peer assessments, can promote task performance (Phielix, Prins, & Kirschner, 2010). Knowledge awareness GATs that provide information on how knowledge is distributed and shared within a group can increase the help learners estimate their partners' prior knowledge more accurately and foster learning outcomes (Sangin, Molinari, Nüssli, & Dillenbourg, 2011). Team and task awareness GATs make the distribution of responsibilities and the understanding of the task by different team members salient. They promote mutual trust and shared mental models, but no results on learning outcomes are known (Fransen, Kirschner, & Erkens, 2011). Moreover, GATs can enable group processes that may support knowledge co-construction like mutual modelling, and foster learning outcomes (Sangin et al., 2011).

More specific to argumentative learning, GATs can promote processes necessary for AKC. GATs that visualized discrepancies in group solutions to statistical problems were compared with analogous GATs for individual solutions. The GATs for group solutions enabled collaborative discussions of the conflicting perspectives and resulted in higher individual learning gains (Bodemer, 2011). GATs can also enhance controversial discussions by revealing conflictual knowledge or differences of views (Buder & Bodemer, 2008). This GAT visualized differences of opinion as they develop dynamically in the discussion. A summary of anonymous opinions was presented juxtaposing conflicting opinions to increase cognitive conflict. This representation of opinions in the group increased critical argument elaboration during collaboration. It also reduced bias by fostering individual and group attitude change towards more minority but correct viewpoints.

In total, there is evidence that GATs that play back cognitive conflicts foster learning outcomes. There is also evidence that GATs that make conflicts in opinions salient to increase socio-cognitive conflict contribute to attitude change and bias reduction. SNS offer a rich interaction context for alerting socio-cognitive conflict. Therefore, GATs that can increase socio-cognitive conflict in peer groups embedded in SNS like Facebook hold promise of facilitating argumentative learning processes that can foster learning outcomes and attitude change.

1.2. Scripts for AKC in Facebook

Scripts define socio-cognitive structures that specify what learners are to do in collaborative learning scenarios, activating existing internal scripts or organizing internally represented disperse elements of scripts (e.g. Fischer, Kollar, Stegmann, & Wecker, 2013; Kollar, Fischer, & Hesse, 2006; Weinberger et al., 2010). Scripts may either prepare the interaction, e.g. through a set of instructions at the beginning of a collaboration session that are to be carried out throughout the session. For instance, they can specify group compositions to increase group dynamic and productive interactions. Alternatively, scripts may structure the interaction on-the-fly, e.g. through using technology that restricts or guides the interaction during the collaborative session (Dillenbourg & Hong, 2008; Dillenbourg & Jermann, 2007). Scripts differ in the degree of structure they implement (Kollar et al., 2006). For example, they can just instruct students to take on a role before the learning session without further directives, or prompt students regularly towards assuming this role but allow them to implement this instruction in their own way, or design the interactions so that students have to obligatorily follow certain steps in order to move on in an environment (Fischer et al., 2013). The different degree of structure may allow for the reactivation of existent internal scripts or the induction of new internal scripts and is decisive for the learning effects of a script. Scripts as instructional methods (*external scripts*) must target the most abstract level of internal representation (*internal script*) (Fischer et al., 2013; Stegmann, Mu, Gehlen-Baum, Fischer, & München, 2011). Negative effects of over-scripting have been identified (Dillenbourg, 2002), but there is also research pointing to deficiencies of minimal guidance for learning outcomes (Kirschner & Clark, 2006), for instance in open learning environments that may be considered similar to Facebook. There is also research that shows positive effects of rather imposed structures for conceptual learning (Papadopoulos, Demetriadis, & Weinberger, 2013).

Scripted AKC has been often shown to promote formal aspects of argumentation, but positive results on domain learning outcomes are disperse (Wecker & Fischer, 2014). Scripting students' discussion of conflicting opinions has been used before with success (Felton & Kuhn, 2001; Jermann & Dillenbourg, 1999). In the ArgueGraph script (Jermann & Dillenbourg, 1999; Jermann & Dillenbourg, 2002; Kobbe et al., 2007), differences in opinions on seminar topics where represented to the students in order to increase socio-cognitive conflict. Students were then asked to resolve these differences in dyads and reach an agreement by writing arguments and making references to their learning materials as sources. Discourse analysis showed that students often provided conditional responses, which met the superordinate learning goal of the course: Namely, that there is no single correct answer.

[4] Group Awareness Tools.