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Empirical study

Effects of teacher framing on student engagement during collaborative reasoning discussions☆

Amanda R. Baker[a,*], Tzu-Jung Lin[b], Jing Chen[b], Narmada Paul[b], Richard C. Anderson[c], Kim Nguyen-Jahiel[c]

[a] Iowa State University, United States
[b] The Ohio State University, United States
[c] University of Illinois at Urbana–Champaign, United States

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ABSTRACT

Collaborative argumentation can enhance students' reasoning, content learning, and interest, but these benefits are contingent upon high levels of student engagement. This study examined the influence of teacher framing strategies that provided autonomy support and structure on students' engagement during Collaborative Reasoning discussions through the lens of self-determination theory. Transcripts and video recordings of 52 discussions in six fourth-grade classrooms were analyzed for (a) teacher framing strategies used to communicate structure and autonomy support for the upcoming discussion, (b) teacher scaffolding strategies used to enhance thinking and interaction during the discussion, and (c) students' cognitive-behavioral and social-emotional engagement during the discussion. The findings identified certain teacher framing and teacher scaffolding strategies that had a significant influence on student engagement. Notably, one teacher framing strategy, collaborative rule-setting, predicted higher cognitive-behavioral and social-emotional engagement after controlling for the effects of teacher scaffolding during the discussions. The evidence suggests that providing task structure in autonomy-supportive ways can enhance student engagement during collaborative argumentation.

1. Introduction

Collaborative learning, a family of instructional approaches in which two or more students work together to accomplish a common goal (Dillenbourg, 1999; Slavin, 2012), is a common instructional strategy at every level of education. Over the past few decades, collaborative learning has become mainstream in K-12 classrooms and have been associated with enhanced achievement in numerous academic domains, including reading, writing, mathematics, and science (Boardman, Klingner, Buckley, Annamma, & Lasser, 2015; Chinn, 2010; Gillies, 2007). In particular, *collaborative argumentation* (Chinn & Clark, 2013), a form of collaborative learning in which several students work together to resolve an issue by taking positions, generating reasons and evidence, and considering multiple perspectives, has been shown to improve students' reasoning skills (Reznitskaya et al., 2001) and content learning (Schwartz, 2009), as well as student interest and motivation to learn (e.g., Hänze & Berger, 2007; Nichols, 1996; Wu, Anderson, Nguyen-Jahiel, & Miller, 2013).

The benefits of collaborative learning appear to be contingent upon the quality of students' collective engagement (Webb, 2009). Students may not reap the benefits of collaborative learning when group members fail to attend to one another's ideas (Barron, 2003), are rude or hypercritical (Chiu & Khoo, 2003; Webb, Nemer, & Zuniga, 2002), or have discrepant understandings of collaborative learning, leading to divergent patterns of engagement (Summers & Volet, 2010). Poor-quality individual and group engagement during collaborative learning is associated with decreased task performance (Sampson & Clark, 2011; Summers & Volet, 2010) as well as lower academic achievement, motivation, and social development (Battistich, Solomon, & Delucchi, 1993).

The purpose of this study was to examine teaching strategies that influence student engagement in the context of collaborative argumentation. Teachers can promote effective collaborative dialogue by preparing students to engage in collaboration and intervening when

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* Corresponding author at: 2648C Lagomarcino Hall, Ames, IA 50011, United States.
E-mail address: ambaker@iastate.edu (A.R. Baker).

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group processes become ineffective (Webb, 2009; Webb et al., 2008). The strategies teachers use to facilitate collaborative activities have been shown to significantly influence student engagement and learning outcomes (Cohen, 1994; Gillies, 2006; Gillies, 2016; Gillies & Khan, 2009). Teacher praise and guidance during collaborative learning has been shown to improve time on task, stimulate critical thinking, encourage the use of argumentative strategies, and balance differences in peer status (Cohen & Lotan, 1995; Jadallah et al., 2011; Lin et al., 2015; Webb et al., 2008). However, some researchers have argued that when teachers intervene too much during collaborative argumentation, the teacher can potentially lower students' sense of agency and autonomy, which then hinders engagement and learning outcomes (Chinn, Anderson, & Waggoner, 2001; Chiu, 2004; Cohen, 1994; Gillies, 2004). To date, research on how teachers can encourage student engagement in collaborative learning without intervening too much remains limited.

One possible approach to improving student engagement without over-intervening is to effectively communicate rules, procedures, and expectations prior to the activity (Mercer, 1996; Nussbaum, 2005). Communicating implicit norms for participation has been found to enhance student engagement and reasoning in collaborative settings (Mercer, 1996; Mercer, Wegerif, & Dawes, 1999). Self-determination theory (SDT; Deci & Ryan, 1985) offers one framework for examining the association between task introduction and student engagement. Research grounded in SDT has suggested that teachers can enhance student engagement by providing optimal levels of structure and support for student autonomy (e.g., Hospel & Galand, 2016; Jang, Reeve, & Deci, 2010). Autonomy support and structure are conveyed through the ways in which teachers (a) communicate rules, norms, and expectations when introducing an activity, (b) intervene to provide guidance and prompts during the activity, and (c) give feedback after the activity (Reeve, 2006). Pre-task communication in particular conveys how students are expected to engage in the activity and, depending on how it is done, has been shown to encourage students' sense of competence and locus of control (Skinner, Zimmer-Gembeck, & Connell, 1998), leading to higher levels of student engagement. Yet the strategies used by teachers to communicate rules, norms, and expectations for an upcoming activity and the influence of these strategies on student engagement have received relatively little attention in the SDT literature (Vansteenkiste et al., 2012).

In the current study, we addressed this research gap by identifying the strategies teachers used to provide autonomy support and structure while introducing a form of collaborative argumentation called Collaborative Reasoning (CR; Anderson, Chinn, Waggoner, & Nguyen, 1998) and examining whether the use of these strategies was associated with student engagement during CR discussions. Extending Engle's (2006) concept of activity framing, we used the term *teacher framing* to refer to a set of strategies that introduce, or frame, the upcoming activity by (a) explicitly setting rules, establishing procedures, or setting goals for interaction, and (b) implicitly communicating expectations, including teacher support for student autonomy. We distinguished teacher framing from teacher scaffolding, with the latter referring to strategies used by teachers to enhance thinking and engagement *during* an activity, such as prompting or praising useful student contributions to the discussion. Our hypothesis was that teacher framing strategies that provided structure and autonomy support would be positively associated with student engagement in Collaborative Reasoning discussions, after controlling for the use of teacher scaffolding during discussions.

2. Theoretical background

2.1. Teacher framing and scaffolding in collaborative argumentation

In collaborative argumentation, two or more individuals engage in a dialogue in which they make claims and support the claims with reasons and evidence (Chinn & Clark, 2013). The current study was conducted in the context of Collaborative Reasoning (CR; Anderson et al., 1998), a small-group approach to collaborative argumentation. During CR discussions, students learn to build on each other's ideas by presenting, arguing, weighing, and balancing multiple perspectives about a complex issue (Anderson et al., 1998). CR discussions are student-centered, allowing students to regulate their own actions, express their own thoughts, make their own decisions, and take responsibility for their own learning outcomes. CR has been shown to produce a substantial increase in the amount and quality of student talk and a significant improvement in students' critical thinking, reasoning, and use of evidence during argumentation (Chinn et al., 2001; Murphy, Wilkinson, Soter, Hennessey, & Alexander, 2009; Reznitskaya et al., 2009). Moreover, students engaged in CR discussions display greater motivation, interest, and engagement than students participating in conventional teacher-directed whole-class discussions (Wu et al., 2013).

In student-centered collaborative argumentation such as CR, teachers can facilitate discussions by *framing* the discussion before it occurs and by *scaffolding* students' thinking and interaction during the discussion. While teacher scaffolding has been found to influence student learning and engagement during collaborative argumentation (e.g., Chiu, 2004; Webb, 2009), less is known about the framing strategies teachers use to prepare students for participating in collaborative argumentation, and how these strategies might influence student engagement. In this study, we simultaneously examined the associations of teacher framing and teacher scaffolding with student engagement. Based on prior research, reviewed in the following sections, we posit that both forms of teacher facilitation influence student engagement during collaborative argumentation.

2.1.1. Teacher framing

Teacher framing includes both explicit explanations of rules, norms, and procedures as well as implicit communication of roles and expectations. Engle (2006) used the term 'framing' to refer to the implicit communication of what participants are expected to do and how they are expected to participate. According to Engle (2006, see also Engle, Lam, Meyer, & Nix, 2012), students have control over the extent to which they transfer information learned in one context to another. Their decision to transfer information to a new context is hypothesized to depend on their interpretation of the context, which is influenced by how the activity is framed.

Several researchers have argued that collaborative argumentation is most effective when a set of 'ground rules' is carefully explicated, justified, and appropriated by teachers and students (Brown & Palinscar, 1989; Gillies, 2016; Mercer, 1996; Nussbaum, 2005; Webb et al., 2008). Ground rules include implicit norms and expectations that students must take into account in order to participate successfully in the collaborative argumentation (Edwards & Mercer, 1987; Mercer & Edwards, 1981). Although rules are commonly assumed to constrain student choices, Mercer (1996) proposed that teachers can use ground rules to convey a model of argumentation he called 'exploratory talk,' in which students make opposing arguments without rigidly adhering to one side. Thus, ground rules can actually expand students' freedom to operate their thinking in exploratory ways. Nussbaum (2005) found that setting up concrete goals (e.g., to generate counterarguments) rather than general goals (e.g., to persuade) can help students develop deeper, more contingent arguments that mirror Mercer's concept of exploratory talk.

In this study, we examined framing in terms of how teachers sent signals to students regarding the rules, norms, and expectations for an upcoming CR discussion through the ways in which they introduced the activity. Effectively framing a peer-led collaborative activity can be challenging. While rules or scripts may increase group efficiency (Fischer, Kollar, Stegmann, & Wecker, 2013), these can also stifle student engagement and peer-to-peer interaction (Cohen, 1994; Cohen,