

Enhancing Collaborative Group Processes to Promote Academic Literacy and Content Learning for Diverse Learners Through Video Reflection

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Brooke Moore¹ , Alison G. Boardman², Clara Smith², and Amy Ferrell²

Abstract

Research indicates the benefits of collaborative learning for supporting academic literacy in content classrooms, especially for diverse and exceptional students such as students with learning disabilities or English learners (ELs) who can become disengaged in content classrooms if they struggle to access complex, content-related texts. Drawing from Cognitive Load Theory, we argue that collaborative group structures support students in sharing the load of processing these texts across all members, thus ensuring better comprehension of the content. Yet, collaborative structures may not be beneficial to diverse and exceptional learners in the group, particularly if students are not supported in how to engage successfully in collaborative work. Using a mixed-methods approach, we explored the use of video reflection and guided discussions with students using collaborative strategic reading (CSR) in heterogeneous collaborative groups in one seventh-grade general education, social studies class in an urban middle school. Students' collaborative group work was video recorded pre- and post-reflection sessions to determine change in engagement in shared learning. The reflection session included students watching the video recording of their group work during CSR, discussing their collaboration using guided prompts, and setting goals for improvement. Following the reflection session, findings revealed an overall increase in time on task for all students, with increased participation of diverse and exceptional students in richer content-related discussions. When all students understand how the collaborative group shares the cognitive load and supports each other through discussing and elaborating on ideas, academic literacy and richer understanding of the content can occur.

Keywords

collaborative learning, video-reflection, supporting diverse learners in middle school classrooms

Introduction

To support adolescents in learning disciplinary content, middle school content teachers (e.g., social studies, science) must develop students' academic literacy, the "reading proficiency required to construct the meaning of content-area texts" (Torgesen et al., 2017, p. 3). One challenge facing middle school content teachers is the variability in reading abilities within a typical content classroom. Diverse and exceptional learners, such as students with reading disabilities or English learners (ELs), often become disengaged in their content classes in the middle grades because they struggle to access more complex content-related texts (Torgesen et al., 2017). If they are provided the tools necessary to comprehend content-specific grade-level texts, they may be more engaged and motivated to improve their reading, thus gaining disciplinary knowledge. One evidence-based, engaging

approach to supporting academic literacy for all learners is through the use of collaborative learning group structures coupled with explicit instruction in reading strategy use (Swanson et al., 2015; Torgesen et al., 2017).

Research indicates key features for effective collaborative group work: (a) grouping students heterogeneously, (b) structuring tasks by assigning roles, (c) establishing group goals along with individual accountability, (d) ensuring positive interdependence (i.e., students need each other to complete the task), and (e) monitoring students by providing

¹Fort Hays State University, KS, USA

²University of Colorado, Boulder, USA

Corresponding Author:

Brooke Moore, Fort Hays State University, 600 Park Street, Hays, KS 67601, USA.

Email: brooke.moore@fhsu.edu



timely feedback (Cohen, 1994; Gillies & Boyle, 2010; Johnson, Johnson, & Roseth, 2010; Slavin, 2011; Stevens & Slavin, 1995). However, some research has indicated that even when teachers put these features into place, students do not always achieve high levels of engagement (Hogan, Natasi, & Pressley, 2000; Kotsopoulos, 2010), achieve equal participation across group members (Kotsopoulos, 2010), or exhibit higher reasoning, thinking, and discussion (Hogan et al., 2000).

One critical component of collaborative learning groups that must be considered is group processing—how well group members engage collectively to achieve the goals of learning (Johnson et al., 2010). Group processing can be supported through the use of rubrics, which are more commonly scored by a teacher after collaboration and then shared with the group (Gillies & Boyle, 2010). Yet, diverse and exceptional adolescents may need more structured and explicit approaches to foster their engagement and participation within collaborative groups to enable them to reflect on their contribution to group work and to set goals for future performance. The purpose of our study was to explore the use of video with explicitly guided discussions using a group-processing rubric to foster adolescents' self-reflection of their participation individually and collectively within heterogeneous collaborative learning groups using collaborative strategic reading (CSR). CSR is an evidence-based reading comprehension model that explicitly teaches students strategies for engaging complex, content-related texts (Klingner, Vaughn, Boardman, & Swanson, 2012; Vaughn et al., 2011). For learners who tend to have lower levels of engagement in general education, attention to group processing may increase their awareness and lead to more productive interactions and increased work quality.

Theoretical Framework

We apply Cognitive Load Theory (CLT; Paas, Renkl, & Sweller, 2003) to collaborative learning to explain how the group serves as an “information processing system” (Janssen, Kirschner, Erkens, Kirschner, & Paas, 2010, p. 140). CLT describes how complex learning begins with an individual utilizing working memory to process information that is then stored through schematic structures in long-term memory. Conscious cognition, such as problem solving or processing new learning, happens in working memory. However, an individual's working memory can only handle a limited number of actions that will successfully lead to stored learning (Paas et al., 2003; Sweller, 1994). When learning something new and complex, an individual draws from his or her stored schema in long-term memory to help carry the cognitive load in working memory (Paas et al., 2003). As adolescents read content texts, their working memory engages, helping them process the reading (e.g., decoding complex words, defining new disciplinary vocabulary). If they comprehend what they read, the knowledge gained is moved to long-term memory and stored schematically for quicker

retrieval when needed. However, if they struggle to access the text, their working memory is overloaded, minimizing long-term storage of knowledge.

CLT suggests that if the load carried by working memory is diminished, more knowledge can be stored. Collaborative group structures share the cognitive load as processing of the text occurs across all members. In CSR, a more fluent reader reads the text aloud to the group, minimizing the cognitive load on a struggling reader who would use working memory. As Cohen and Lotan (2014) noted, cognitive growth occurs through interactions with peers, some more knowledgeable than others in different areas. These interactions propel the learning, and cognitive development, of the group forward. “For a group to carry out a learning task, not all group members need to possess all necessary knowledge, or process all available information alone” (Janssen et al., 2010, p. 144).

The cognition needed to comprehend a complex, content-related text includes (a) active and conscious sharing (i.e., retrieving information from the text), (b) discussing (elaborating on the information shared), and (c) remembering (personalizing, storing; Janssen et al., 2010). The processes through which the collaboration occurs are important to ensuring that the cognitive load is carried over to long-term memory. How well the load is carried by the group depends on interactions between the assigned task, the individual learners, and group characteristics (Janssen et al., 2010). As Johnson et al. (2010) noted, there are challenges inherent in placing adolescents in small groups and expecting them to succeed. A closer examination of the process in which the group engages may reveal ways teachers can promote more success in carrying the cognitive load while engaging complex content-related reading.

CSR

CSR (Klingner et al., 2012) is an evidence-based reading comprehension model emphasizing explicit comprehension strategy instruction coupled with heterogeneous collaborative learning. CSR supports students in developing metacognitive and self-regulation skills necessary to read complex, content-related texts together. Collaborative learning in CSR involves each student carrying out a role within his or her group (leader, clunk expert, gist expert, and question expert) and working together to comprehend the text. Cue cards serve as scaffolds to help students learn and use their roles as they are supported by the teacher. This process allows diverse and exceptional students to participate more equitably in their collaborative group because the cognitive load is shared across the group as they apply comprehension strategies, engage in discussions, and develop a deeper understanding of the disciplinary content. CSR also has built-in supports for language learning, such as cue cards to support students in asking/writing/answering questions and in supporting others thinking about the text.

A typical CSR lesson involves a text that is broken into logical sections. Students engage in the preview (prereading routine that guides students to access and build background knowledge about the topic and relevant key words) as a whole group. Then, the small groups work through each section of the text using the following comprehension strategies: (a) clunks (strategies used to define unfamiliar words/phrases called “clunks” in CSR because a clunk disrupts the readers’ fluency, similar to a driver hitting a pothole on an otherwise smooth road) and (b) get the gist (individual composition and peer review of each group member’s gist statement, a main idea sentence of a section of the text that was just read). Once all sections of the text have been read and discussed, the group engages in questioning (individual creation and collaborative discussion of three question types for the reading) followed by review (composition and discussion of each group member’s summary paragraph of the entire reading).

Research on Collaborative Learning Groups

Research suggests that using heterogeneous collaborative learning groups positively influences academic development. A key reason why collaborative learning works is that mixed-ability groups draw on the differences of group members as assets to be tapped to enhance learning (Järvelä & Järvenoja, 2011). For example, peer-mediated instruction supports diverse and exceptional learners in overcoming obstacles they encounter when working independently in a general education classroom (Buzhardt, Greenwood, Abbott, & Tapia, 2007). Furthermore, the motivation to learn can be enhanced through the social contexts of collaborative learning as students work together to overcome challenges (e.g., differences in opinions in the group, task requirements) to complete an assignment (Järvelä & Järvenoja, 2011; Järvelä, Violet, & Järvenoja, 2010). Finally, collaborative learning prompts students to become more metacognitive and aware of their use of specific strategies (Stevens & Slavin, 1995). When students are engaged in group work, they are simultaneously developing their skills at self-regulating their own learning by being “metacognitively, motivationally, and behaviorally active participants in their own learning process” (Zimmerman, 2008, p. 167).

Despite these benefits, challenges exist with implementing collaborative structures. Gillies and Boyle (2010) noted teachers’ frustration with socializing and off-task behavior. Cohen (1994) found that when students were assigned unstructured collaborative tasks, they worked independently, then brought together their tasks at the end for a finished product. This may be problematic for diverse and exceptional learners. As Slavin (2011) noted, “When the group task is to do something, rather than to learn something, the participation of less able students may be seen as

interference rather than help” (p. 8). When tasks are not structured and students are not given clear expectations and instructions in what to do and how to do it, collaborative learning may not lend itself to successful academic outcomes. In particular, as O’Connor and Jenkins (2013) noted, the level of support provided to diverse and exceptional students in collaborative learning groups may not be sufficient enough to enable them to participate equally.

Hogan et al. (2000) video recorded collaborative learning groups in eighth-grade science classrooms to examine discourse, interactions, and reasoning complexity. The authors found teacher-guided conversations to be of higher quality than those that were student led and made suggestions for how teachers can better foster such conversations with small groups. One suggestion was having students watch excerpts of exemplary group conversations and have a class discussion about strengths and weaknesses of the interactions observed. For diverse and exceptional learners, watching what collaboration should look like may be of benefit in helping them emulate such behavior.

Providing supports for engaging students in collaborative dialogue with others must include attention to group processing, such as what the process of collaboration should look like. Such approaches are often addressed through rubrics. Kotsopoulos (2010) described the “illusion of collaboration” (p. 132), where students learned how to talk the talk of collaboration, then “parroted” (p. 136) back that language to their teacher when asked how well they worked together without internalizing the behavior they were expected to exhibit. In her research, she found that groups were not working collaboratively, though they scored themselves on rubrics as achieving success. Once students watched video recordings of their group work, they recognized differences in their perceptions of what collaboration meant. “Self-surveillance” (Kotsopoulos, 2010, p. 130) disrupted students’ understanding of collaboration, supporting them to think more overtly about their group work. Similar to the work of Hogan et al. (2000) above, the use of video—as examples of what to do, or as reflective tools to explore group processes—proves potentially valuable for all learners, but potentially more so for diverse and exceptional learners.

The purpose of our study was to introduce video as a self-reflection tool for collaborative learning groups and examine group processes to enhance their engagement in shared learning as a means to support their academic literacy. Used in conjunction with a group process rubric and explicitly guided discussions, we were interested in change in collaborative engagement from pre- to post-reflection discussions, particularly for diverse and exceptional learners within those groups. Our research questions were as follows:

Research Question 1: How does the collaborative group process change after a video-reflection intervention?

Research Question 2: How does participation of diverse learners change after a video-reflection intervention?

Method

Setting

We conducted our study in a seventh-grade general education social studies classroom in a Colorado urban middle school with a student population of 72% Hispanic/Latinx, 24% ELs, 16% identified in special education, and 81% eligible for free/reduced lunch. The teacher was a participant in a larger study validating the effects of CSR and received professional development training in using CSR that included a focus on using collaborative learning groups. She was in her second year of using CSR with her students. With her help, we identified one of her class periods in which she felt she needed more support in helping them engage successfully in collaborative learning groups.

Participants

Although the classroom included eight collaborative learning groups ($n = 33$ students), participants in our study were placed into three heterogeneous groups ($n = 12$), based on returned signed consent forms for our study. Three students were ELs, three were identified by special education status, and six were eligible for free and/or reduced lunch.¹ The groups were equally distributed by gender (i.e., two females/two males in each group). Of the ELs, two spoke Spanish as their primary language, and one spoke Swahili. Of the students in special education, all three were identified with specific learning disabilities and two were also identified with emotional/behavioral disorders.

Video-Reflection Intervention

Our study occurred over 1 month during the spring semester in the fourth year of a 5-year implementation/sustainability study of CSR within the school district. As such, educators and their students were supported to use CSR from professional development providers and instructional coaches from the university and from the school district. The participants in this study had been introduced to CSR the year prior when they were in sixth grade, and had been using CSR consistently in this particular seventh-grade classroom all year. In their sixth-grade classrooms, and again during the first few weeks of seventh grade, teachers in the school utilized CSR introductory lessons where students learned and practiced their collaborative roles (leader, clunk expert, gist expert, question expert) and learned and practiced the comprehension strategies (clunks, gists, questions, review). This particular teacher used CSR for reading a text related to the content in all of her classes every week, so students in this study were familiar with the CSR process as well as the strategies for reading comprehension. However, she felt that this particular class period was struggling to fully understand how the collaborative work could benefit their learning.

We began our study by showing the class a five-minute video clip of an exemplary collaborative group using CSR. We focused students' attention on how each member in the video contributed to collective learning by asking guiding questions about the video they observed: (a) what are the students doing; (b) what are they *not* doing; (c) at what times are they working independently, sharing, discussing; and (d) who helped others understand better? On the following day, we video recorded each of the groups as they were using CSR for approximately 8 to 10 min each. During this class period, the students were assigned a text with three major sections about practicing Ramadan while in college.

After groups were video recorded, we edited the videos to 3- to 5-min excerpts including moments related to CSR work (e.g., students working independently and collaborating on ideas) and moments related to on-task versus off-task behaviors. We then met with each group individually in a guided discussion. During this time, students watched the excerpts of their video, engaged in researcher-facilitated dialogue to reflect on their participation in their group. We used the Group Interview Protocol (see Appendix A) to lead the discussion. Questions targeted students' attention to CSR strategies (e.g., working independently to find clunks or write gists, sharing gists, offering feedback), on collaboration (e.g., items related to participation, support given, and problem solving as a team), and on next steps for the group (e.g., what did you do well, what could be worked on, goals for next time). Finally, each student independently completed a group process rubric (see Appendix B).

After reflection sessions, we video recorded each of the groups again as they were using CSR. This time, the teacher had assigned a text with three sections on the discovery of a Mayan burial site. The groups utilized the CSR process, with assigned roles, to complete the full text.

Data Collection

The data we collected included video recordings of each collaborative group, field notes of reflection sessions, and group process rubrics from each student.

Video recordings. Each group was video recorded twice, at pre- and post-reflection sessions, as students were using CSR and during a time in the CSR model when they were discussing a section of text they had just read.

Field notes of reflection sessions. One of the authors took field notes of the reflection discussion sessions to capture students' reactions when watching their video excerpt (e.g., Mike² is covering his eyes and moaning, Tess is laughing and pointing to Dylan). Students' comments and ideas were also noted (e.g., John—we need to make sure everyone gets a chance to talk).

Group process rubrics. During the reflection sessions, each individual group member filled out a group process rubric. Students were then asked to share their thoughts about how they scored their group work. Finally, each student was asked to write her or his own comment(s) that would only be shared with the researchers.

Data Analysis

We analyzed data across groups (e.g., counts of collaborative turns, ranging from off task to elaborating on another's idea; content of discussions, either process related or content related) and within groups (e.g., pre-reflection video, post-reflection video, and reflection discussion) to examine the change in collective work of the group, particularly for the diverse and exceptional students. Our data analysis involved both qualitative methods (e.g., inductive and deductive coding) and quantitative methods (e.g., counts and percentage of types of talk in groups, described in more detail below).

Video analysis. Transcriptions of video recordings included time counts (e.g., how long an individual engaged in an activity), words spoken by each student, and a description of student actions (e.g., Gabe is playing with his pencil). Each line represented a "turn" taken by a participant in the group (Sacks, Schegloff, & Jefferson, 1974). Although turn-taking in conversations can be coded by topic, we specifically coded each "turn" by speaker. Turns included verbal and/or nonverbal actions. For example, the following consisted of a turn that included both verbal and nonverbal actions, "KG: Inquiry? It's like the third (She is pointing at her text) . . . the third line."

Coding of video data. Initial codes were deductively drawn from our theoretical framework on CLT and research on collaborative learning (e.g., working independently, sharing ideas, discussing ideas; Janssen et al., 2010; Johnson et al., 2010), and inductively from the data itself (e.g., talk was related to the procedures of group work or to the content of the reading). Following our initial coding, we refined codes with all authors working together to code two video clips. Finally, we coded the remainder of the video clips independently, conducting interrater reliability checks and revising any discrepancies to attain 100% reliability on all coding. Our codes included the following: (a) verbal, nonverbal, or both; (b) collaboration codes (e.g., 0 = off task, 1 = independent work, 2 = sharing, 3 = elaborating); (c) type of talk (e.g., content related, procedural—related to the CSR process); (d) quality of the content-related talk (e.g., expansion of ideas, queries); and (e) nonverbal context (e.g., text reference, writing, listening, copying, nodding agreement/disagreement, using resources; see Appendix C).

Counts of turns taken by participants. Following coding, we sorted codes and conducted counts, translated into percentages, for each coding category by student and per

video clip (pre-reflection, post-reflection). We determined percentage of time per collaboration category (e.g., counts of off-task behavior/counts of total turns in the group per recording) and percentage of the quality of talk (e.g., counts of content-related talk/counts of total turns in the group). We then compared the percentages and counts across and within groups (pre- and post-reflection).

Analysis of reflection sessions. Field notes of reflection sessions were coded similarly to the video clips, but with more emphasis placed on what students noticed or reacted to when watching their group work. In particular, we compared turns taken, and verbal/nonverbal actions while watching and discussing their video excerpts.

Findings

We first describe overall changes in group processes across groups, and then describe in more depth how those changes were influenced by variability within each group.

Changes in Collaborative Processes Across Groups

Table 1 displays the data for our analysis of the levels of collaboration, separated by groups, identified by each group member. The numbers included are the percentage of the turns taken by each group member for that level of collaboration per total turns taken across the group for that specific video-recorded session (i.e., pre-reflection, post-reflection video). Level 0 was off-task behavior (i.e., no collaborative work), Level 1 was independent work (i.e., reading silently, writing quietly), Level 2 was sharing of ideas, and Level 3 was elaborating on the idea of another student in the group. Significant reductions in off-task behavior across groups occurred following the group reflection sessions ($t = 4.08, p < .01$), with all groups more engaged to the assigned task. Across all groups, there was also a slight drop in the number of independent turns taken following reflection, though not significant. Marginally significant increases occurred in sharing behaviors following group reflection sessions ($t = 2.257, p < .05$) with more students engaged in sharing their ideas (e.g., Sara, Dylan, and Mike did not share ideas in the pre-reflection video). Across all groups, there was an increase in the number of elaborating turns that occurred following the reflection session, though not significant. These group changes from less off task to more elaboration on other's ideas is practically significant as well, considering that this sharing of the cognitive load in the task of reading a content-specific text supports the academic literacy of all group members, building their disciplinary knowledge. As Janssen et al. (2010) noted, how well the cognitive load is carried by the group depends on the interactions of the group members around the assigned task of reading a content-specific text.

Table 1. Levels of Collaboration in Percentage of Group Turns Taken at Pre- and Postreflection.

	Off task Level 0		Independent Level 1		Sharing Level 2		Elaborating Level 3	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Group 1								
Gabe ^a	6	1	10	3	1	5	8	9
Sara ^b	5	0	5	2	0	4	0	5
John	2	1	4	3	1	7	22	14
Kristen	0	3	3	4	8	12	24	29
Total	13 ^c	5 ^c	22	12	10 ^d	28 ^d	54	57
Group 2								
Dylan ^a	15	0	7	5	0	4	12	25
Louis ^b	7	0	8	8	2	3	7	8
Fawn	4	1	9	6	2	0	6	8
Tess	0	0	9	6	3	4	11	22
Total	26 ^c	1 ^c	33	25	7 ^d	11 ^d	36	63
Group 3								
Mike ^a	20	2	3	10	0	7	7	14
Peter ^b	12	3	1	11	1	0	7	3
Gina	9	2	7	14	1	6	3	3
Maribel	14	0	9	16	3	2	4	7
Total	55 ^c	7 ^c	20	51	5 ^d	15 ^d	21	27

^aStudent identified with a learning disability.

^bStudent identified as an English learner.

^cStrong evidence of a difference between pre- and postreflection off-task turns ($t = 4.08, p < .01$).

^dMarginal evidence of a difference between pre- and postreflection sharing turns ($t = 2.257, p < .05$).

Although there were no significant changes in the quality of talk from pre- to post-reflection recordings at the group level, there were changes within groups by individual group members. Table 2 displays the data for our analysis of the quality of each of the elaborating turns (Collaboration Level 3) taken per group member at pre- and post-reflection. The numbers represent the percentage of the type of elaborating turns taken by each group member per total elaborating turns taken for the group for that specific video-recorded session (i.e., pre-reflection, post-reflection video). Elaborating turns were coded as content related (e.g., specific to the text being read by the group) or procedural (e.g., specific to using CSR, related to taking turns). Content-related turns were further coded to examine the type of elaborating, including expansion of ideas and queries that push the collective thinking of the group. As Cohen and Lotan (2014) described, learning can often occur from a more knowledgeable member of a collaborative group as others engage in listening and thinking about what is shared.

Changes in Collaborative Processes Within Groups

Group 1. Group 1 included Gabe (identified with a specific learning disability), Sara (EL, predominate language—Swahili), John, and Kristen.

Pre-reflection video. Group 1 was off task 13% of the time. Independent work occurred 22% of the time and consisted of each member writing clunks or gists on their own. This is to be expected when students use CSR as they need to think independently before they can share their ideas. Sharing occurred 10% of the time (e.g., John: “What’s ‘salat’? I think that is my clunk.” *He writes it down.*). As Janssen et al. (2010) noted, actively sharing is part of carrying the cognitive load, and an important part of comprehending a complex, content-related text. Group 1 elaborated on each other’s ideas 54% of their time. Of their elaborations, 10% were devoted to procedural questions or comments (e.g., Gabe: “Write the gist?”), 38% were queries regarding the text (e.g., Kristen: “So you think ‘lecture’ is talking to someone?”), and 54% were expansions of other’s ideas (e.g., John: “‘Lect’ means to talk.” *He is using a root word resource.*). Although Group 1 did elaborate and support each other’s ideas some of the time, their overall collaborative efforts were not always helpful. For example, when Sara whispered something to Kristen, Kristen’s response was, “Well, what do *you* think?” Kristen did not offer help but continued her independent writing. When John asked questions about a clunk, Kristen said he should “know” the answer as they had been studying this topic for a week. By not engaging in carrying the cognitive load through active, conscious sharing of ideas (Janssen et al., 2010), learning of the content was minimized.

Table 2. Quality of Elaborating Talk in Percentage of Elaborations per Group.

	Content					
	Expansion of ideas		Query regarding content		Procedural	
	Pre	Post	Pre	Post	Pre	Post
Group 1						
Gabe ^a	8	10	6	3	1	3
Sara ^b	0	3	0	5	0	0
John	23	16	14	7	4	2
Kristen	23	20	18	18	5	13
Total	54	49	38	33	10	18
Group 2						
Dylan ^a	13	27	11	2	11	10
Louis ^b	4	8	4	2	11	2
Fawn	0	8	4	2	13	2
Tess	15	19	6	18	9	8
Total	32	62	25	24	44	22
Group 3						
Mike ^a	10	24	5	12	19	15
Peter ^b	19	9	10	3	5	0
Gina	5	9	5	0	5	3
Maribel	10	15	5	3	5	9
Total	44	57	25	18	34	27

^aStudent identified with a learning disability.

^bStudent identified as an English learner.

Reflection session. When scoring their group process rubric, all members felt they worked well together, and they all scored themselves as proficient in offering support (e.g., taking turns speaking, being helpful to each other). When asked about possible goals for their group work, Gabe suggested they needed to take turns when speaking, an interesting observation given that he was often interrupted in the pre-reflection video.

Post-reflection video. Following their group reflection session, Group 1's off-task behavior dropped to 5%. Sharing of ideas occurred significantly higher at post-reflection video (28%). Elaborations stayed approximately the same; however, the quality of elaborations changed. The group focused more on procedural turns, using CSR to help them work collaboratively (e.g., Kristen: "So, any last clunks that we need to discuss?"). Although the expansion of other's ideas and content-related queries did drop slightly, the turns taken were longer. The longer time it took in taking turns occurred because each student was speaking longer, including more content in what they were sharing. Consequently, the number of times (i.e., counts) they elaborated and engaged in content queries decreased at post-reflection. All were more engaged in actively listening to each other speak. Overall, Group 1's post-intervention group work demonstrated that they understood the procedures of CSR better. The work was more distributed, group members were more on task, and collaborative efforts were more helpful in supporting comprehension

of the text. The process they engaged in post-reflection was more productive in supporting all members to carry the cognitive load, thus, potentially moving the learning to long-term memory (Paas et al., 2003), and better supporting academic literacy development (Torgesen et al., 2017).

Gabe—student with a learning disability. In the pre-reflection video, Gabe's work was generally independent and his off-task behaviors were mostly silent (e.g., watching others, watching another group, tapping his pencil). When he was on task, he posed several questions that indicated he needed clarification of both the process or of the content of the reading (e.g., Gabe: "So what's the most important? What's her name? What's her name?"). However, Gabe did attempt to contribute ideas to the conversation, but was often interrupted, as in this excerpt.

Kristen: What does it mean, right there where it says, "I barely get through a couple of lectures and practically die back in my dormitory."

She is reading the text.

Gabe is looking at his fingernails.

John is pointing to his text.

Gabe: What are lectures? [Gabe has identified a clunk in the text for him and shared with his group.]

Kristen: What are lectures? This is spoken at the same time. [Kristen, too, has identified and shared a clunk for her in the text.]

Sara pulls her role card over to her and looks at it.

Gabe: Lectures are like . . .

John: . . . somebody, you're telling people . . .

He interrupts Gabe and is gesturing with his hand as he is talking.

Gabe: Like, lectures can be like . . .

John: . . . like when you are talking to someone.

He interrupts Gabe again.

Kristen: So like you TALK to someone?

She is looking back at her text.

Following the group reflection session, Gabe initially contributed ideas in the form of one-word statements. For example, when deciding on some key ideas to use in writing a gist statement (i.e., one sentence main idea of the section of text they have just read) in the reading on the Mayan burial site, Gabe contributed “the Inca,” “mummies,” and “being controversial”—all of which were relevant to the text. When the group was struggling to define the clunk “controversial,” Gabe reread the sentence with the clunk. John suggested the word meant “discovery,” to which Gabe initially disagreed (Gabe: “Nuh uh.” *He is shaking his head to indicate no.* “Because it says that here it’s not a discovery.” *He pauses.* “Well maybe it is . . .”). Later, Gabe suggested that controversial meant “against something.” His contributions to the group helped them determine the meaning of the word controversial, which then solidified their understanding of the section. As the group was more equitable in turn-taking, Gabe became more efficient at having his ideas heard, thus contributing more to the quality of their understanding of the text.

Sara—EL. In the prereflection video, Sara’s off-task actions were silent and predominantly included playing with the role card she was holding. Although these behaviors were coded as “off-task” by the researchers, there is a possibility that Sara was listening to her group, and, thus, participating in learning. Sara’s independent time consisted of looking at her text or watching her group. Her collaborative contributions were not captured on the audio but involved her leaning toward Kristen and whispering a question on two separate occasions.

In the post-reflection video, when Kristen asked whether anyone had any clunks, Sara responded by shaking her head to indicate yes and pointing to a word in the text. Sara demonstrated more verbal actions in the post-intervention video, most of which were coded as queries (e.g., Sara: “In the mountains?” *She is speaking very quietly.*). She also quietly elaborated on ideas the group discussed. When John asked who found the mummy controversial, Sara added quietly after others had paused, “the culture.” Although Sara’s contributions were still few, the group opened up more space throughout to allow her to contribute. The process of creating space for all group members to contribute ideas is key to

supporting students who are diverse and exceptional. Although sharing the cognitive load is important, allocating think time—as this group started to do for Gabe and Sara after the reflection session—for remembering the content, connecting it to prior learning, and personalizing the learning for future retrieval may be key to supporting diverse and exceptional learners in developing academic literacy (Janssen et al., 2010).

Group 2. Group 2 included Dylan (identified with a specific learning disability and an emotional/behavioral disorder), Louis (EL, predominate language—Spanish), Fawn, and Tess.

Pre-reflection video. Group 2 was off task 26% of the time and working independently 33% of the time. They only shared ideas 7% of the time. Group 2 elaborated on other’s turns 36% of the time. Of their elaborations, 44% of them were procedural (e.g., Fawn: “You need to write your own gist, not copy his.”). Of the elaborations that were content related, 25% were queries (e.g., Tess: “After dawn, that’s like when the sun comes up?”) and 32% were expansions (e.g., Louis: *He is tapping his pencil.* “So fasting is probably easier in the morning.”). Overall, Group 2 used the process of CSR, but more independently than collaboratively. Elaborations were not focused on a coherent text-related conversation, but responses to independent queries as the group members predominantly completed their learning log (e.g., a CSR-specific worksheet that supports the CSR process by allowing students to independently record their clunks, gists, questions/answers, and review statement) on their own.

Reflection session. As Group 2 watched their video, the group members were very quiet. At one point, Dylan hid his head and apologized for his off-task behaviors. When scoring their group process independently, they all rated their group as proficient. However, Dylan marked one item, “members propose some ideas or solutions,” as developing. When the researcher noted that he scored something differently and asked why, Dylan responded, “Because, um, some people didn’t have anything to say, like Louis? He didn’t talk.” As a group, they identified problem solving and participation from all the group members as a goal moving forward.

Post-reflection video. Following their reflection session, Group 2 was off task only 1% of the time and worked independently 25% of the time. The group shared more (11%) and increased their elaborations to 63% of their group time. Of the elaborations, procedural comments dropped to 22%. Queries related to the content remained constant (24%), but expansions on other’s ideas increased to 62%. This is a key link to the argument that sharing the cognitive load increases academic literacy (Torgesen et al., 2017). As Janssen et al. (2010) noted, the act of discussing and elaborating on other’s ideas supports comprehension. No one group member

has to make all the connections, but they make connections together. One substantial difference was conversation coherence. Content-related queries posed in the pre-reflection video were often quickly answered and the group continued working independently. At post-reflection, queries were taken up and richer content-related conversations ensued. For example, Tess asked whether her gist was okay and Louis interrupted, questioning her use of the word “mummies.” Dylan elaborated, “They didn’t sacrifice mummies.” Fawn then expanded, “They sacrificed humans.”

Dylan—Student with a learning disability and emotional/behavioral disorder. Dylan’s off-task behavior (15%) in the pre-reflection video created distractions for his group and included entertaining himself (e.g., *Dylan is singing and dancing in his chair.*) and asking off-topic questions (e.g., Dylan: “Do I look like I have rabies?”). When Tess asked the group to share their gist statements, Dylan had written nothing and responded, “I’m the retard³ in this group!” Although Dylan did not share ideas in the pre-reflection session, he did ask content-related questions (Dylan: “So, what’s the chick’s name?” *He points to the text.*) and responded to other’s questions (Dylan: “It’s Ramadan, dude!”).

Following the reflection session, Dylan was on task throughout the post-reflection video. While he was still active (e.g., *Dylan is looking at Louis and tapping his pen. He then whistles quietly, and looks back at his text. He continues to drum and whistle quietly as he is watching his group members working. He then starts drawing on his paper.*), his behavior was not disruptive to his group. Dylan contributed numerous meaningful ideas that were taken up by the group, such as is noted above when guiding Tess to clarify her understanding that mummies are not sacrificed.

Louis—EL. In the pre-reflection video, Louis’ off-task behavior was mostly laughing at Dylan. He shared with his group a little, but contributed more in regard to procedures (e.g., Louis: “No, she is Gist Expert.” *He points to Fawn.*). After the reflection session, Louis’ contributions to the collective learning shifted from procedural to more content related. On numerous occasions, Louis’ contributions to the group included listening and agreeing (*Louis shakes his head to indicate yes and starts writing.*). He interjected when Tess wrote an inaccurate gist, and was able to answer content-related queries (e.g., Louis: “They buried it so high on the mountains so that they would be near the god.”). As Cohen and Lotan (2014) suggested, these examples demonstrate that students not generally recognized by peers as being knowledgeable (i.e., diverse and exceptional learners) were contributing equitably and knowledgeably to the groups’ learning.

Group 3. Group 3 included Mike (identified with a specific learning disability and an emotional/behavioral disorder),

Peter (EL, predominate language—Spanish), Gina, and Maribel.

Pre-reflection video. Group 3 was off task 55% of the time during their pre-reflection video, consisting primarily of the entertaining behaviors of Mike whose actions were distracting to his group as well as Group 1. Group 3 worked independently 20% of the time (mostly Gina and Maribel), shared ideas only 5% of the time, and elaborated 21% of the time. Of the elaborations, 34% of them were procedural, which were mostly questions (e.g., Maribel: “Do you have any clunks?” *She is asking Gina quietly.*). Queries made up 25% of the elaborations related to the content (e.g., Gina: “So she’s in college?”) and Group 3 expanded on each other’s ideas 44% of their elaboration time. This predominantly occurred during a conversation to define the clunk “dormitory,” and was the only time the group worked collaborative.

Maribel: Do you have any clunks?

Gina: Yeah, dormitory.

She is pointing to her text.

Maribel pulls her learning log out and starts writing.

Peter: It’s a DORM-itory . . .

Mike: Dormitory

He is pulling out his learning log and starting to write.

Peter: It’s where people live when they go to school.

Maribel: In college.

Mike: NO! That’s a DORM.

Maribel: That’s right. It’s the place where they live.

Peter: It’s a room with people’s stuff.

Mike: NO! A college room is called a DORM.

Peter: A DORM is called a dormitory.

Peter is looking at the camera and pretends like he is sticking his finger in Mike’s ear.

Mike is pushing Peter away and laughing.

Gina: It’s a building.

Peter: I already told you that.

He is looking at Mike’s paper, and then copies what he has written for the word dormitory.

Mike: The building

He is still writing.

Peter: Where the rooms are.

Reflection session. As Group 3 watched their group work on video, they initially seemed entertained. On several occasions, Mike and Peter covered their faces with their hands, or would cover their mouths. They both laughed out loud, particularly at the beginning of the video. However, toward the end, Mike’s demeanor shifted. He moved back in his chair, started looking down more, and stopped laughing. Toward the end of the video clip, he covered his face in his hands and stated, “Tell me when it’s over.” When asked about group process, they initially stated that they all talked about the most important ideas. The researcher asked them whether that was

what they saw in the video. After a pause, Mike commented that they talked a bit about the reading, but mostly Maribel and Gina talked about the reading. They scored themselves as developing on the rubric, and unanimously felt that the one thing they could do better next time would be to stay on task. On his rubric, Mike wrote, “We were a little off task (me) and we (I) need to work on that a little.”

Post-reflection video. Group 3’s off-task behavior dropped considerably in their post-reflection video to 7% of the time. Their independent work increased to 51% of the time. The group shared more of their gist statements (15%) and elaborations remained about the same, though they talked about procedures less and asked fewer procedural questions. They spent more turns expanding on other’s ideas. The content-related queries elicited thoughtful conversations (e.g., Maribel: “So that’s what made it substantial then?”). Peter responded to Maribel’s query by confirming that the mummy was frozen and Mike expanded, “It was preserved. The stuff that was saved, like her skin, and stuff was important. Contents of her stomach.” Overall, Group 3 demonstrated the most change in levels of collaboration as compared with the other groups, most likely because they were off task more in their pre-reflection video than the other groups. The off-task behavior demonstrated by this group in their pre-reflection group work denied them the opportunity to have their cognitive load shared (Paas et al., 2003). They were essentially working independently on comprehending a text, and the outcome was overall poor understanding of the content assigned to be learned.

Mike—Student with a learning disability and emotional/behavioral disorder. Mike’s off-task behavior during the pre-reflection video was profoundly disruptive to his own learning as well as the learning of the group. He made sound effects (e.g., Mike: “Ha. HA! CaCAW! CaCAW!” *He is making bird sound effects.*), posed for the camera (e.g., *Mike is leaning over out of his seat. When he sits up, he is holding a pair of sunglasses. He puts them on and grins at the camera.*), and started off-topic conversations (e.g., Mike: “What if I was a secret code in the camera where if you take a video and say, ‘Smile’ it then says, NOW DO THE HARLEM SHAKE,” *Mike is speaking in a deep voice* “. . . and it randomly makes them dance and they’re not dancing.” *Mike is holding up his hands to make a frame and he is dancing in it.*). He included Peter often in his antics, and Gina and Maribel were not amused (e.g., *Gina is looking at Mike and shaking her head; Maribel is watching Mike, but not smiling or laughing and states* “. . . my GOSH!”). Although Mike attempted to contribute to the dormitory conversation noted above, his contributions reflected his lack of attention to the text as well as to the conversation. It was unclear whether he ever fully understood that a dorm is a dormitory because he defined dormitory in his learning log as “a building with rooms.” During the post-reflection video, Mike was off task

a few times, but not disruptive to his group. Once he whispered something to Peter who giggled, then both went back to work. Mike worked more independently, completing more of his learning log. And, his contributions were on track, and contributed to the collective understanding (e.g., Mike: “Here’s what I think it means.” *He is pointing to his learning log and then starts reading.* “The fact that ice preserved the body makes Juanita a *rare* scientific find—for that time.”). This was reinforced as they worked to define substantial, as noted above.

Peter—EL. Peter was off task during the pre-reflection video mostly because of Mike. He did the least amount of independent work, barely filling in anything on his learning log. He rarely shared ideas, but did elaborate. His elaborations included his role in defining dormitory. Although Peter’s definition was correct, it was not taken up by the group, and he did not pursue it as being inaccurate. Instead, he copied Mike’s inaccurate definition onto his own learning log. Following the reflection session, Peter played with a coin and smiled at the camera some of the time, but did more independent work by completing his learning log on his own. He did not share ideas, but did elaborate, though less than in his pre-reflection video. Instead, Peter spent more time actually looking at the text and using resources (i.e., affixes list, root word list). He also listened more attentively to all group members as compared with before. When Peter contributed to the collaborative work, he asked content-related questions (e.g., Peter: “Where did she die?”). He also contributed to the groups’ definition of substantial by disagreeing that it was not “almost” rare, but was indeed very rare and unusual. The transformation of Mike and Peter following the reflection session was statistically significant and certainly meaningful. By engaging in the text and text-related discussions, they worked to develop academic literacy (Torgesen et al., 2017) in not only themselves but also their group members. They shared the load better, which led to a richer understanding of the content. Furthermore, their recognition of their contributions to the learning of others holds the potential for them to shift their own thinking about their ability to learn and engage in schools.

Conclusion

Our study reinforces the findings that collaborative group work can help diverse and exceptional learners expand on their content understanding, particularly if they explicitly understand how the group shares the cognitive load and supports each other through asking questions, sharing ideas, and then discussing and elaborating on them. In each of our collaborative groups, our video-reflection intervention changed group processes in positive ways that supported the development of each group members’ academic literacy (Torgesen et al., 2017), reinforcing their understanding of the seventh-grade social studies content.

In our collaborative learning groups, students' on-task behavior and collaborative efforts improved following our video self-reflection intervention. Each group demonstrated significant decreases in off-task behavior. Each group significantly increased sharing of their ideas. Content-related talk as compared with procedural-related talk increased, though not significantly, particularly in regard to elaboration on others' ideas. When students are spending less time socializing and entertaining, they can focus on the content and the collaborative process, sharing the cognitive load (Janssen et al., 2010; Paas et al., 2003).

Although students in this class had viewed and discussed exemplary video clips of collaborative learning groups, they were not practicing what they saw. Once they watched their own video clip, their understanding of collaborative learning changed. Using the group process rubric (Appendix B) helped them reflect more deeply. For example, in Group 1, all group members indicated on their rubrics that they had taken turns. Gabe pointed out that taking turns does not mean interrupting. Because Gabe reflected more deeply, likely having felt the impact of being interrupted by his peers, his insight changed his groups' collaborative turn-taking in the post-reflection video, producing more productive dialogue. As Kotsopoulos (2010) noted, the "illusion of collaboration" was unveiled.

More nuanced positive changes occurred when looking at the engagement and participation of our diverse and exceptional learners. In Group 2's pre-reflection video, Dylan provided an excuse to his group regarding his incomplete learning log that indicated a lack of self-confidence in his ability to participate. For many students who struggle to read, comprehending a complex seventh-grade social studies text can be disengaging. As CLT (Janssen et al., 2010) suggests and research on collaborative learning confirms (Järvelä et al., 2010; Zimmerman, 2008), providing Dylan with resources and dialogue proved he could contribute. In their reflection session, Dylan identified an instance when he helped and interjected, "Hey look! I helped you!" Consequently, his engagement and participation were enhanced in his post-reflection video. Furthermore, the contributions of each of the diverse and exceptional learners after the intervention were valued by other group members as important toward the understanding of the content, rather than interference, as Slavin (2011) described. Not only were individual students reflecting upon their own behavior, they were reflecting upon the group's behavior as a whole, which

translated into more focused and cohesive conversations in each group's post-reflection group work. This created accountability among the group members that led to more on-task and collaborative behavior following the video-reflection intervention.

Implications for Research and Practice

Although our study indicated success across all group members, our limited number of participants does not warrant claims of the validity of utilizing video as a self-reflection tool for collaborative learning groups to analyze group processes. We recommend more research to determine both merit of our reflection process with collaborative groups and impact over time as groups continue to collaborate together on complex tasks.

We also recognize that engaging in our video-reflection intervention is time consuming and not practical in large general education, content-related classrooms at the middle school level. We purposefully selected a classroom that had struggled to work well collaboratively in small groups. Two of the authors video recorded and met with each of the eight groups in the class, collecting data on only three groups. Although we did not have data to support post-reflection group interactions and participation for all groups in the class, the teacher indicated that our intervention qualitatively changed the nature of this class period. Therefore, we do suggest considering the use of our video-reflection intervention for particularly challenging groups who struggle to stay on task, to maintain engagement, and to grasp the importance of using each other to share the cognitive load and learn the content.

Although the video self-reflection intervention proved successful in increasing on-task behavior and collaborative efforts across the groups, our work was not as effective in equalizing participation across group members. Those students who were more verbal in the pre-reflection video continued to do so in the post-reflection, and quieter members of the group continued to remain quiet. We recognize that video self-reflection was helpful to our students in honing their collaborative skills, but educators must continue to use a variety of strategies to improve group processes in collaborative learning groups, and diverse and exceptional learners will continue to need scaffolded support when working with peers in general education classrooms.

Appendix A

Video Study Small Group Interview Protocol

CSR component items

1. At what times were you working independently during the clunk section? Did you find clunks? Did you share them with each other?
2. Who was helping to figure out the meaning of the clunk? How was he or she helping?
3. At what times were you working independently during the gist section?
4. Did you determine the most important who/what and the most important information together?
5. Did you share your gist statements with each other?
6. Who was helping to improve someone's gist? How was he or she helping?

CSR collaboration items

Using the group rubric form, explain the form and then give each group member time to complete the form. Discuss.

Next steps questions

1. What did you do well together?
2. In what ways could you work better as a group?
3. What will be your goals for next time?

Appendix B

Group Process Rubric.

Group Member	Role

	Proficient	Developing	Not proficient
Participation	<ul style="list-style-type: none"> • Everyone participates • Roles followed • Group stays on task 	<ul style="list-style-type: none"> • Everyone participates • Roles somewhat followed • Group mostly stays on task 	<ul style="list-style-type: none"> • Not everyone participates • Roles ignored • Group off task
Support	<ul style="list-style-type: none"> • Members take turns speaking • Members use respectful voices • Members give helpful feedback to each other 	<ul style="list-style-type: none"> • Members mostly take turns speaking • Members use respectful voices • Members give general or lacking feedback to each other 	<ul style="list-style-type: none"> • Members interrupt each other • Members speak harshly or rudely to one another • Little to no feedback, or feedback is way too general to be helpful
Problem solving	<ul style="list-style-type: none"> • Group always attempts to resolve issues independently • Members propose thoughtful ideas and solutions 	<ul style="list-style-type: none"> • Group often makes attempts to resolve issues independently • Members propose some ideas or solutions 	<ul style="list-style-type: none"> • Group calls on teacher to resolve all issues • Members propose few to no ideas or solutions

Comments:

Appendix C

Code category	Definition	Example
Collaboration		
0	Off task	[00:00:21.25] Dylan: "I'm trying to make your hair move." (He is still waving at TN.)
1	Independent work	[00:00:20.00]: (Tess is reading her text.)
2	Collaboration	[00:03:35.29] Dylan: "Yeah? What do we put on, um, on gist?" (He is tapping on his learning log, looking down, and then back to Tess.)
3	Elaborating	[00:03:49.01] Fawn: "I agree. They sacrificed humans."
Quality		
Content	Related to the text or curriculum	[00:00:03.01]: (Students are looking at their texts.)
Procedural	Related to CSR or collaboration process	[00:00:58.29] Tess: "Are we only doing 2 sections?" (She points to the text.)
Verbal		
Query	Student asks a question, either related to content or procedure	[00:00:43.25] Fawn: "What is this?" (She moves her text over in front of Tess and points to a word—"pre-dawn.")
Response	Student responds to another student (or teacher) following a query	[00:03:40.05] Dylan: "Yeah, I put Ramadan." (He shakes his head yes.)
Elaboration	Student expands on another's (or their own) response	[00:01:13.05] Tess: "Yes. Collapsing. To fall over." (She is writing as she talks).
Prompt	Student prompting group to do something	[00:01:03.12] Tess: "You guys have any clunks?"
Nonverbal		
Text reference	Students looking at their text, reading, searching for evidence from text	[00:00:43.25] Fawn: "What is this?" (She moves her text over in front of Tess and points to a word—"pre-dawn.")
Learning logs	Students are writing in their learning logs or referencing their writing	[00:01:07.25] Tess: "Collapsing?" (Dylan, Fawn, and Tess all write collapsing on their logs.)
Using resources	Students use or reference other CSR resources (flipbooks)	[00:01:50.04]: (Fawn is leaning in trying to reach the flipbooks. She pulls one out of the Ziploc bag in the center of the table and starts looking through it.)
Agreement/disagreement	Students nod in agreement or disagreement with each other	[00:02:16.02]: (Fawn nods her head to indicate yes.)
Listening	Students demonstrate active listening or show that they are paying attention to another student	[00:00:58.32]: (Louis stops talking with other group, and looks at Tess and teacher.)
Copying	Student looking at another's work and then copies it on own learning log.	[00:03:03.20]: (Tess moves her hand and he looks at what she has written.)
Waiting	Students waiting while others finish independent work	[00:03:27.08] Dylan: "Are you through?" (He looks back at the members in his group. They ignore him and keep writing.)

Note. CSR = collaborative strategic reading.

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ORCID iD

Brooke Moore  <https://orcid.org/0000-0001-9764-3675>

Notes

1. We were unable to identify which of the 12 student participants were eligible for free/reduced lunch due to confidentiality measures in the school.
2. All names are pseudonyms.
3. We found Dylan's use of this pejorative as a self-identifier indicative of his own perceived participation in his group at this time, and relevant to our intervention as his self-perception changed following the reflection session.

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Author Biographies

Brooke Moore, PhD, is the interim chair and an assistant professor in the Advanced Education Programs department in the College of Education at Fort Hays State University in Hays, Kansas. Formerly a special educator working primarily with students with learning disabilities, her research focuses on helping educators create equitable and inclusive learning environments for all students.

Alison G. Boardman is an associate professor in Educational Equity and Cultural Diversity in the School of Education at the University of Colorado Boulder. Boardman works closely with educators to study and innovate literacy practices in classrooms that include emergent bilingual learners and student with disabilities.

Clara Smith, PhD, is a STEM Department Change Consultant at the University of Colorado - Boulder for the Departmental Action Team Project. This departmentally-based working group aims to sustainably improve undergraduate education across departments. She received her PhD from the University of Colorado in Educational Equity and Cultural Diversity, a program focused on the field of bilingual multicultural education, with an emphasis on social justice issues in

education. Her dissertation topic and research interests include the underrepresentation of bilingual students in gifted education.

Amy Ferrell (formerly Boelé) is an assistant professor of special education in the School of Education and Human Development at the University of Colorado Denver, where she studies community, discourse, and literacy for people with disabilities. Her work, which situates disability research in social, cultural, historical, racial, linguistic, and political contexts, has appeared in journals such as *Harvard Educational Review*, *Reading Research Quarterly*, *Linguistics and Education*, and *International Journal of Inclusive Education*. She is coauthor of the second edition of *The Ethics of Special Education* (Teachers College Press).