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EXPLORING TEACHER CONTRIBUTIONS TO STUDENT ARGUMENTATION QUALITY

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Abstract

The purpose of this study was to improve our understanding of how experienced teachers contribute to student argumentation quality during classroom inquiry dialogue. Analysis of discussion transcripts, teacher interviews, and shared review of discussion video identified a set of seven teacher moves used by three experienced teachers in support of student argumentation. Analysis further suggested the moves were enlisted to serve two primary purposes – to clarify the process and the product of the inquiry dialogue.

Keywords

inquiry dialogue, classroom dialogue, teacher moves, argumentation, argumentation quality, philosophy for children

Introduction

For decades, educators have emphasized the importance of argumentation in helping students think through complex problems (Halpern, 1998; Kuhn & Crowell, 2011), support conceptual change (Asterhan & Schwarz, 2007; Nussbaum & Sinatra, 2003; Wiley & Voss, 1999), and make sound judgments (Gregory, 2009; Gregory & Laverty, 2009; Sharp, 1987; Sternberg, 1999, 2003). Given the educational value placed on argument skills, we need to know more about how teachers can support the development of argumentation with their students.

Theory and research suggest that classroom dialogue can be used to help students develop the knowledge and skills of argumentation (Frijters, ten Dam, & Rijlaarsdam, 2008; Murphy, Wilkinson, Soter, Hennessey, & Alexander, 2009; Reznitskaya et al., 2001). Additionally, studies have identified several features of dialogic interactions conducive to the development of argumentation (Burbules, 1993; Lipman, 2003; Mercer & Littleton, 2007; Nystrand, Wu, Gamoran, Zeiser, & Long, 2003; Scott, Mortimer, & Aguiar, 2006; Soter et al., 2008). Effective classroom dialogue should follow a more egalitarian participation structure, focus on contestable questions, and see students attending to the process of dialogue rather than simply focus on the outcomes (Reznitskaya & Gregory, 2013).

Empirical research has demonstrated the pedagogical potential of classroom dialogue for supporting students' inferential comprehension of text, argumentative writing, and reasoning across contexts (Dong, Anderson, Li, & Kim, 2008; Kuhn & Crowell, 2011; Mercer, Wegerif, & Dawes, 1999; Reznitskaya et al., 2001). For example, Kuhn and Crowell (2011) studied adolescent (middle-school) students engaged in peer dialogues where they were asked to develop and evaluate reasons for a given position and to anticipate reasons one might give against their position. Following the intervention, the students wrote argumentative essays that were longer, contained more arguments and had more dual-perspective arguments compared to the essays of students who did not participate in dialogic activities.

Although classroom dialogue shows promise for the development of argumentation, the literature indicates the practice is still largely absent in schools (Applebee, Langer, Nystrand, & Gamoran, 2003; Commeyras & DeGroff, 1998; Nystrand, 1997). The gap between the perceived value of dialogue and the continued use of more traditional instructional methods may, in part, be due to classroom dialogue representing a dramatic shift, not only in teaching practices but in teachers' conception of teaching and learning itself. Studies have shown that teachers struggle to make this shift and need support in doing so (Adler, Rougle, Kaiser, & Caughlan, 2003; Alverman &

Hayes, 1989; Juzwik, Sherry, Caughlan, Heintz, & Borsheim-Black, 2012). Further, the challenge of helping teachers to shift toward a more dialogic approach is exacerbated by a lack of understanding around what teachers should do during an inquiry dialogue. The purpose of this study then is to better understand how teachers contribute to the quality of argumentation during classroom inquiry dialogue. This purpose serves as the overarching research question of the study. Three specific research questions guided the collection and analysis of the data. They are:

1. Is quality argumentation achieved during discussions?
2. What facilitation moves are associated with instances of quality argumentation?
3. Why do facilitators use moves as they do?

To answer these research questions, I analysed transcripts of classroom discussions, collected as part of a previous research study on the use of inquiry dialogue in elementary school language arts classrooms in the US (Reznitskaya et al., 2012). As part of that analysis, I tracked the student generation of *core argument features* evoked to respond to a contestable issue or question within a given inquiry dialogue.

After identifying core argument features, I applied a framework for measuring argumentation quality (Erduran, Simon, & Osborne, 2004) to identify instances of argumentation quality. I then developed a record of teacher *moves* during the same discussions. These moves were confirmed and further explored during interviews with the facilitators. By analysing the relationship between the teacher moves and the argument threads, I developed a picture for how those interventions contributed to argument quality.

Literature Review

Dialogue

In *The New Dialectic*, Douglas Walton (1998) suggested that dialogues can be distinguished by their purpose. Walton identified several dialogue types, including inquiry, negotiation, and persuasion. An *inquiry dialogue* is a collaborative engagement of participants, aimed at determining the truth or reasonability of a given proposition (Walton, 1989, 1998). Walton distinguished inquiry dialogue from instances of negotiation or persuasion in ways that are directly relevant to the development of argumentation. For example, where inquiry aims at what is most reasonable to believe or do, negotiations are resolved when the desires of the participants are satisfied. Rather than depend on good reasoning, a negotiation could be resolved through brainstorming, simple agreement, or, in some cases, a lucky guess. Thus, inquiry dialogue represents a normative dialogue type for the purpose of supporting (and

studying) the development of students' reasoning as it is most aligned with the norms and practices of rational argumentation. Given this alignment, this study used inquiry dialogue as a theoretical frame for the classroom discussions.

Learning and Cognitive Theory

In terms of learning theories, the use of inquiry dialogue is supported by social-constructivist perspectives on learning (Mead, 1962; Rogoff, 1990; Vygotsky, 1968). These theories point to social interaction as a mechanism for the internalization of new and more complex ways of thinking that are indicative of higher levels of cognitive development (Vygotsky, 1981).

Cognitive psychologists have explored another theoretical construct called a *schema*, which describes how we organize and represent our learning and understanding within memory (Anderson & Pearson, 1984; Thorndyke & Hayes-Roth, 1979; Reed, 1993). A schema is a general knowledge structure made up of common features representing a concept, object, or situation that is filled in with particular details in a given moment. According to schema theory, when we experience a particular situation we activate the appropriate schema based on the recognition of key features of that schema. New experiences can also help us to revise the schema to improve its usefulness. Argument schema theory (AST) brings the insights of schema theory to bear on argumentation processes (Reznitskaya & Anderson, 2002). AST helps us to conceptualize how schema construction happens during inquiry dialogue and is applied and refined through subsequent episodes of argumentation. Specifically, AST describes how the use of argumentation skills, such as giving reasons, providing evidence, generating examples, and other moves, become part of an abstract conception of argumentation that can be used in new contexts. If we want to learn more about how teachers can support quality argumentation, then AST as a theoretical frame will help here as well.

Analysis of Argumentation

One widely used approach to analysing argumentation in group discussions involves the use of a framework developed by Stephen Toulmin (1958). A typical way of applying the framework has been to identify and extrapolate core argumentation features that arise in student discussion (e.g. Driver, Newton, & Osborne, 2000; Erduran et al., 2004; Jiménez-Aleixandre, Rodriguez, & Duschl, 2000; Kelly, Druker, & Chen, 1998). Core features serve specific functions in the process of leading to a conclusion. Additionally, the presence and number of core features often serve as indicators of argument quality within the literature.

Although common, researchers have reported that these approaches require a significant amount of interpretation on the part of the analyst (Duschl, Ellenbogen, & Erduran, 1999) and involve challenges in applying these

frameworks accurately and consistently (Kelly et al., 1998). Researchers have used various approaches and analytic frameworks to address the challenges of applying the Toulmin model. These approaches include variations on the Toulmin model and the use of other frameworks, such as the one proposed by Walton (1998). For example, Erduran et al. (2004) supplemented the Toulmin model with a coding scheme that distinguishes arguments according to their level of complexity based upon the quantity and type of Toulmin's core elements within an argument. Based on the extensive use of the Toulmin model in the literature and the effective use of the quality framework in their project, this study used the Erduran scheme to identify instances of argument quality during classroom inquiry dialogue.

Philosophy for Children

There are a number of established approaches to classroom discussion identified in the literature, including Grand Conversations, Book Clubs, Literature Circles, Instructional Conversations, Questioning the Author, Junior Great Books, Collaborative Reasoning, Philosophy for Children (P4C), and Paideia Seminars (Soter et al., 2008). Soter et al. highlighted three of these approaches as reflecting a "critical-analytic" stance, namely Paideia Seminars, P4C, and Collaborative Reasoning. They further described a critical-analytic stance as giving "prominence to querying or interrogating the text in search of the underlying arguments, assumptions, worldviews, or beliefs that can be inferred from the text" (Soter et al., 2008, p. 374).

P4C (Lipman, 1981, 2003; Lipman & Sharp, 1978) is an established pedagogical program developed and advanced by Matthew Lipman and Ann Margaret Sharp. Central to the P4C program is the development of a classroom *community of inquiry*. Communities of inquiry are intentional communities, often consisting of the students within a classroom, who regularly engage in inquiry dialogue. In P4C, the dialogues are about philosophical questions or concepts. Additionally, the community of inquiry regularly reflects, as a group, on the forms and rules of their engagement and revises them to meet its goals – the goal is for "participants to arrive at one or more reasonable, philosophical judgments regarding the questions or issues that occasioned the dialogue" (Gregory, 2007, p. 161).

Empirical studies on the P4C approach are significant in number (e.g. Green, Condy, & Chigona, 2012; Kyle, 1983, 1987; Niklasson, Ohlsson, & Ringborg 1996), although this research has met with some criticism (for a review and critique, see García-Moriyón, Rebollo, & Colom, 2004; Reznitskaya, 2004; Trickey & Topping, 2004). Several studies of P4C have looked systematically at the role of the facilitator (teacher) as part of the analysis (Gillies, Nichols, Burgh, & Haynes 2012; Kovalainen, Kumpulainen, & Vasama, 2001; Kovalainen & Kumpulainen, 2005; Reznitskaya et al., 2012).

Reznitskaya et al. (2012) found that facilitators of inquiry dialogue speak less and ask questions that "serve multiple functions: to clarify student thinking (e.g., 'So, we choose the age to be fair, then?'), to introduce new perspectives (e.g., '. . .and isn't the alternative true?'), and to position the ideas of group members in relation to each other (e.g., 'So, you're agreeing with Ann?')" (p. 299). In another study of teacher facilitation during P4C sessions, Kovalainen et al. (2001) were able to identify four modes of discourse engaged in by the facilitator, namely evocative (e.g. getting students to contribute and take positions), facilitative (e.g. restating student offerings and helping them to connect to others), collective (e.g. reminding of the norms of participation, getting students to take responsibility for the process), and appreciative (e.g. valuing contributions, taking care of the needs of individual participants). Unfortunately, neither study sought to establish the impact of teacher practices or modes of practice on argument quality.

Although researchers across the various approaches have looked at types of teacher talk, they have not examined connections between the strategic use of teacher talk and the rigour of group argumentation that results. Questions about how and when to use moves and why to do so remain open and represent a significant gap if we hope to develop clear and effective approaches to facilitation for quality argumentation. This study seeks to address this gap by examining the modes and relevant strategies in connection to argumentation quality.

Methodology and Methods

Three research questions serve the purpose of the study – to understand how facilitators contribute to argumentation quality.

1. Is quality argumentation achieved during discussions?
2. What facilitation moves are associated with instances of quality argumentation?
3. Why do facilitators use moves as they do?

This section describes the sample, data, and design used to answer these questions.

Sample

This study utilized purposeful sampling (Merriam & Tisdell, 2016). I drew my sample from data collected during a larger study on P4C conducted by Reznitskaya et al. (2012). That quasi-experimental study used P4C to examine its impact on argumentation development of elementary school children. In the study, 12 fifth-grade classrooms were randomly assigned to one of two treatment conditions: P4C and regular instruction.

In the six P4C classrooms, three experienced facilitators engaged students in inquiry dialogue using strategies consistent with P4C pedagogy, as outlined in the published literature (Lipman, Sharp, & Oscanyan, 1980; Splitter & Sharp, 1995). Philosophical questions in P4C conditions meet the criteria of being contestable and cognitively challenging, identified above as a central component to classroom dialogue.

The present study analysed data from 18 experimental condition (P4C) transcripts generated during the initial study. These discussions represent "information-rich" (Patton, 2002) cases, reflecting key criteria of intensive dialogue (Applebee et al., 2003; Nystrand, 1997), represent a critical analytic stance (Soter et al., 2008), and focus on three facilitators with extensive experience in P4C "including graduate study, publication of original theory or research, professional development work with other practitioners and multiple years of facilitation experience with a wide variety of students in diverse contexts" (Reznitskaya et al., 2012). Because only three experienced facilitators were involved in the study, I used the entire population.

Data

Data for this study include transcripts of video-recorded classroom discussions generated in the initial study and transcripts of audio-recorded interviews conducted with the sample facilitators during the present study.

Classroom Discussion Transcripts (initial study)

I analysed classroom discussion transcripts from each of the facilitators, focusing on the two highest-rated transcripts for each as indicated by a measure of dialogic quality called the Dialogic Inquiry Tool (Reznitskaya, Glina, & Oyler, 2011). This tool has been validated and has evidence to support its validity and reliability (Reznitskaya et al., 2012).

Facilitator Interview Transcripts (present study)

The semi-structured interviews (Merriam & Tisdell, 2016) followed a protocol generated during the analysis of the classroom discussion transcripts. The interview protocol had two sections. The first section, called "General Beliefs and Practices," included questions aimed at exploring the facilitator's beliefs concerning inquiry dialogue, the practice of facilitation, and the use of argumentation in facilitation. The purpose of the questions was to better understand how facilitators think about their facilitation practices and the purpose of facilitation. These questions emerged as potentially relevant during the analysis of moves as patterns and types of moves did not seem to fully explain the difference between the facilitators.

In addition to these general features, questions were designed to explore key findings and interpretations from the initial round of analysis. This second section of the interview involved a shared review of the videos and transcripts. The facilitators were provided a transcript from each of the discussions to reference while watching the videos. The transcripts covered the segments analysed, with a particular focus on critical instances where interpretation of moves needed substantiation. During this stage of the interview, the facilitators were asked to comment on what they had heard and were responding to during the discussions. They were also asked to explain specific facilitator moves they had made. Their responses were used to confirm and refine my interpretation of moves.

Interviews ranged from 55 minutes to 2 hours and 16 minutes. I conducted two of the interviews. As one of the facilitators in the study, I used a second interviewer, Dr Alina Reznitskaya, who has a background in studying student argumentation, to conduct my own interview. Dr Reznitskaya was the principal investigator for the initial study and therefore familiar with the data. All interviews were transcribed and imported into NVivo for further analysis.

Design

This study followed a largely qualitative design utilizing qualitative content analysis (Schreier, 2013) and aspects of grounded theory (Glaser & Strauss, 2008). Some minimal counting of moves, turns, and words was also involved.

To increase the trustworthiness of the study, I used triangulation (Merriam & Tisdell, 2016) to find a point of convergence among the data sources-discussion transcripts and facilitator interviews. For example, my initial interpretations of the facilitator's role, derived from analysis of the discussion transcripts, were further tested through interviewing facilitators. I also used a constant comparison method (Glaser & Strauss, 2008) to identify codes or themes from the data. Each time an instance of a given code emerged, I compared that new instance with previous instances and with the current iteration of the code itself. This reflective comparison served as a way of refining the code and improving its accuracy. By engaging in this process repeatedly and across multiple cases, I increased confidence in the interpretations of the data. I further enhanced confidence and consistency in the use of the codes by maintaining an audit trail (Merriam & Tisdell, 2016), where I recorded how codes were derived and how key coding decisions were made.

Another form of triangulation involved comparing facilitator responses in the two segments of the interview. For each of the reported facilitator beliefs, I went to their explanation of moves to see if they explained their moves (shared review) in ways that were consistent with their reported beliefs (general beliefs and practices).

Overview of Data Analysis

The analysis of data progressed through three phases, from an analysis of the discussion transcripts, to the development of the facilitator interview protocol, and culminating in an analysis of interview transcripts. This process is outlined in Figure 1 below.

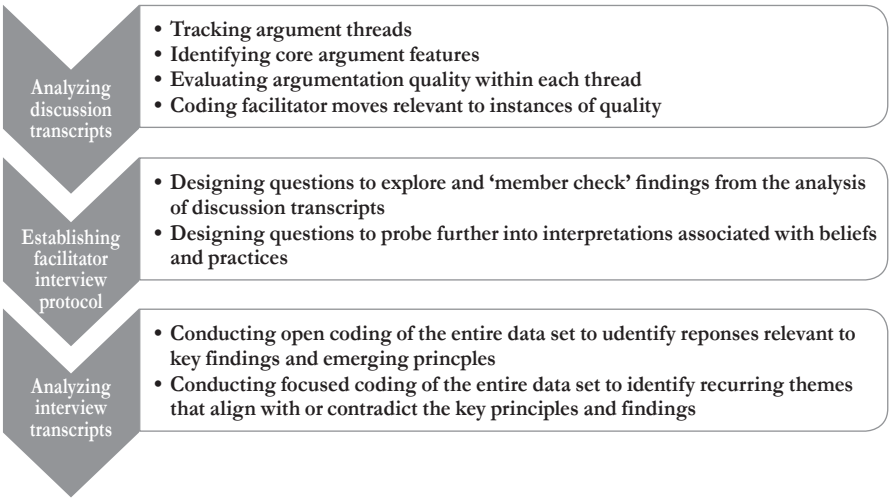

Figure 1
Phases of data analysis

Analysis of Discussion Transcripts: Identifying Core Argument Features

I analysed discussion transcripts to identify the following core argument features, reflective of the Toulmin framework used by Erduran et al. (2004): claim, data, warrant, challenge, and response to challenge. The literature on argument analysis pointed to difficulties in interpreting core argument features, such as distinguishing warrants from claims (see reviews by Nielsen [2011] and Nussbaum [2011] for a thorough analysis). For example, Kelly et al. (1998) characterized the identification of argument elements, such as data, claim, and warrant, as a "subtle affair" (p. 856). In response to the subtleties of these distinctions, Kelly et al. (1998) chose to look at the specific argument that a student was making within the broader context of the conversation. They looked forward and backward in the discussion to contextualize the claims being made by the students. Their focus was on clarifying the particular point being made and how it related to other statements in the discussion.

Similar to Kelly et al. (1998), I looked at individual student turns as they related to the more general dialogic context. I tried to capture this context by organizing the dialogues into *arguments threads* (unique to this study). An argument thread is a sequence of core argument features evoked to respond to a contestable issue or question. The anchor for a thread is often the question the inquiry seeks to answer, or the *big question*. In other words, a thread is all the core features generated in response to the big question. As the elements of an argument are often interrelated, the use of argument threads as an analytic context proved extremely useful in the analysis.

A*nalysis of Discussion Transcripts: Argumentation Quality*

Some argumentation researchers see quality as an extension of the complexity (more and different argumentative features) of the arguments constructed. For example, Erduran et al. (2004) generated a framework (Table 1) to supplement the Toulmin model that would allow it to be used as a "quantitative as well as a qualitative indicator of the teaching and learning occurring in classrooms" (Erudran et al., 2004, p. 916).

Table 1
Erduran Framework

Level 1	Level 1 argumentation consists of arguments that are a simple claim versus a counterclaim or a claim versus a claim.
Level 2	Level 2 argumentation has arguments consisting of a claim versus a claim with either data, warrants, or backings but no challenges.
Level 3	Level 3 argumentation has arguments with a series of claims or counterclaims with either data, warrants, or backings with a weak or ill-defined challenge.
Level 4	Level 4 argumentation shows arguments with a claim and a clearly identifiable challenge. Such an argument may have several challenges, claims, and counterclaims.
Level 5	Level 5 argumentation displays an extended argument with more than one challenge or a challenge that successfully refutes a claim or argument thread.

The framework retains a focus on core elements, but ranks oppositions, or challenges, according to levels of strength. Due to its successful application in previous studies, I applied the Erduran ranking framework to determine quality.

Analysis of Discussion Transcripts: Analysis of Facilitator Moves

I initially coded facilitator moves based on the literature on the various approaches to classroom discussion (e.g. Michaels, O'Connor, & Resnick, 2008; Splitter & Sharp, 1995; Waggoner, Chinn, Yi, & Anderson, 1995). The literature on the P4C (the pedagogical context of this study) approach (Kennedy, 2004, 2013; Gregory, 2007, 2009) led me to a narrower set of moves that I felt were consistent with insights from the other approaches reviewed. Although these moves are termed differently in the different approaches, they fit into categories that are common across the approaches. These similarities are supported and articulated by Soter et al. (2008) and align with the features of inquiry dialogue summarized by Reznitskaya and Gregory (2013).

However, instead of just using the facilitator moves from P4C literature as codes, I asked the following questions during the analysis to test and revise them and seek out new ones: *What is the facilitator doing here? What is the facilitator focusing on? How does this move impact the discussion? Is this move consistent with previous moves? What is happening in terms of argumentation here? How is the move impacting argumentation quality?* This final question helped me to maintain a focus on understanding the contribution of the move to argumentation quality. Initial, open coding of the data identified 21 different moves – a list that was larger and somewhat different from the list of P4C moves I began with.

I continued the analysis of facilitator moves with this new set of 21 moves. As I engaged in the analysis, I worked reiteratively to revise the codes and identify new ones where they emerged. Throughout the process, I maintained notes on decisions made concerning the application of codes and revised the coding manual based on my notes. As codes were populated, revisions were made that included adding, deleting, merging, and breaking apart the codes.

Analysis of Interview Transcripts

To check my interpretation of moves, I reviewed discussion video with the associated facilitator during interviews. During the review, a form of "member check" (Merriam & Tisdell, 2016), teachers confirmed interpretations of the facilitation moves they made and the features of the discussion they were responding to. They sometimes commented on whether or not their recorded behaviours corresponded to their ostensible pedagogical principles. For each segment viewed, I asked the facilitator the following questions: *What is happening here? Why did you make this move here?* Facilitator responses to these questions were used to make slight revisions to codes, but generally confirmed interpretations made during the move analysis.

In addition to the shared review of videos, I interviewed facilitators about their general beliefs related to inquiry dialogue. The full interviews were transcribed and analysis of interview transcripts was used to substantiate

or refine codes for facilitation and explored for additional themes related to the pedagogical decisions for using moves. Analysis of interview transcripts followed the procedures of qualitative content analysis. Themes that emerged were compared to the interpretations generated there.

Results

In the section below, I organize key findings according to the three research questions:

1. Is quality argumentation achieved during discussions?
2. What facilitation moves are associated with instances of quality argumentation?
3. Why do facilitators use moves as they do?

Results: Is quality argumentation achieved during discussions?

Analysis showed that moderate to high levels of argument quality, on the Erduran scale, were achieved in each of the discussions. As illustrated in Table 1 above, Erduran et al. (2004) organized argument elements into clusters of features, e.g. claims–warrant–rebuttal. As discussed in the Identification of Core Argument Features section above, I also organised these feature clusters according to the question being responded to. I termed this organisational frame an argument thread. For a more detailed discussion of the use and value of argument threads, see Oyler (2015).

Table 2 shows that Level 4 argumentation was achieved and sustained for extended turn sequences in each of the discussions.

Table 2
Argument quality by discussion, facilitator, level of quality, number of turns, and (word count)

	Thread 1	Thread 2	Thread 3	Thread 4
Discussion 1: Auth	**Level 4**, 92 Turns (3,470)			
Discussion 2: Auth	**Level 4**, 55 Turns (2,475)	**Level 4**, 22 Turns (871)		
Discussion 1: Fac. 2	**Level 4**, 105 Turns (3,545)	Level 2, 7 Turns (112)		
Discussion 2: Fac. 2	**Level 4**, 48 Turns (1,476)	**Level 4**, 27 Turns (766)		
Discussion 1: Fac. 3	**Level 4**, 49 Turns (1.725)	Level 3, 20 Turns (737)	Level 2, 6 Turns (152)	**Level 4**, 25 Turns (812)
Discussion 2: Fac. 3	Level 3, 38 Turns (1,241)	**Level 4**, 46 Turns (1,913)		

The table also shows that some discussions addressed multiple questions, as indicated by multiple threads. During discussions, a shift in the big question, and by extension a thread, was often made to explore a different but related issue relevant to the initial big question (e.g. to define a concept being applied in the discussion). For example, the discussion involving Gina (pseudonym) below initially focused on the question "At what age should we be able to vote?" After 55 turns, the group shifted the discussion to establishing what counted as an "adult" in response to Gina's challenge.

Gina:	…And second of all, who says that at 18 you're an adult? Why can't you be an adult when you're 12? Like, who made up this rule that when you're 18, you're an adult? I mean at restaurants, the kid's menu is 12 and under usually, not 18 and younger.
Facilitator:	Right. So we're asking a question about when you become an adult or what, what makes an adult?
Gina:	Yeah.
Facilitator:	So, what's an adult and when do you become one? (Discussion 2: Auth)

In addition to identifying the levels of quality reached, Table 2 also illustrates that Level 4 quality was consistently found during discussions segments with an extended focus on one big question (indicated in Table 2 by threads of 25 turns or more). This suggested that the length of threads or "focus" deserved further exploration during interviews with facilitators. Two questions in the protocol for the general beliefs and practices section of the interviews were particularly relevant here: *How important is it to stay on the same topic during a discussion? How do you decide when to shift topics?*

What facilitation moves are associated with instances of quality argumentation?

As I mentioned in the analysis of facilitation moves, the literature and initial open coding of transcripts brought me to a revised list of 21 moves. In many cases, the revision involved merging narrowly defined moves into moves that better captured a more general facilitative function that the move executed. For example, the literature identifies interventions like "calling for or offering a counter example" as a discreet move (Kennedy, 2013). In the final list of moves for this study, that intervention would be captured as Probing Reasoning if the facilitation move functioned to bring about further justification or support of the argument. If, instead, an example was requested simply to clarify what was meant by a participant's statement, the request for an example would fall under the Requesting Clarification move – a move rarely made during the discussions analysed. There was also no clear contribution to quality associated with requests for clarification. Likewise, discreet moves such as Making a Connection were merged into Locating in the final list of codes.

The completed analysis of discussion and interview transcripts suggests that facilitators in the study relied on a set of seven facilitation moves to help support quality discussions. Table 3 presents the seven moves that emerged as most relevant to instances of argumentation quality:

Table 3
Facilitator moves

Code	Description	Example
Paraphrasing	A facilitator expresses the meaning of another person's statement using different words to achieve greater clarity.	"He's saying that if you're intelligent at sports – if you're good at baseball, you're intelligent in it? You're smart at it." "So, in other words, Matthew is saying that the same whatever this skill is, or this capacity is, it's the same in a laboratory and on a blacktop."
Distilling	A facilitator identifies and/or extracts a specific part of a statement. It is akin to highlighting a part of a passage in a reading.	Ex. 1 – [Initial statement] "Everyone votes. Can't the parents tell their kids to vote for someone and they can make them vote." [Distillation] "They can make them do it." Ex 2 – [Initial statement] "We are saying how it's so bad that we kill animals, but other animals kill other animals to get food, so if we kill animals to get food, I don't think it's that bad, unless we are doing it for sport." [Distillation] "But unless we are doing it for sport?"
Identifying or Completing a Warrant	A facilitator clarifies or completes a warrant. Often termed an "if, then" relationship. The point is to make the inferential link explicit.	Ex 1 – [Initial statement] "Just... the same consequences. 'Cause if it happens, by accident or on purpose, you can't really say the same, it's about consequences." [Warrant identification] "…So if somebody gets hurt, then you should suffer the consequences, whether it's an accident?" Ex 2 – [Initial statement] "I think, um, you should just leave it in the wild. Because like, in the zoo, that's like, not where they were born. And they need to learn to hunt in the wild and do what they are supposed to do and in a zoo they just, like, sit there." [Warrant identification] "If they're in the wild then they learn what they are supposed to do."

Locating	A facilitator attempts to identify or make clear how a given statement fits within the general line of inquiry (thread) or that it does not fit.	"So, you are building on what Sarah said." "How does that connect with Katie's and Matt's?" "What does that mean for the big question then?" "Maybe we should give Matt, um, the opportunity to respond, since two people have disagreed with him."
Naming Moves	A facilitator assigns a label to the argumentation/dialogue move made. S/he names the dialogue move they are executing rather than focusing on the content of what they are saying.	"So, you are making a distinction." "You agree with John then." "I can add another example." "OK. So, we've got it's not really a contradiction. It's a building move."
Probing Reasoning	A facilitator probes reasoning by bringing out, or attempting to bring out, an unstated or implied aspect of a statement. This could be a reason, distinction, criterion, or qualifier. It is explicating reasoning, whereas requesting clarification is about explicating the meaning of terms.	"This sounds different though. What is the difference?" "What are your reasons though?" "So, it is maturity that is important here?" "So, is intelligence just talent?" "Is that so in all cases?"
Redirecting	The facilitator redirects a participant(s) to return to or address something that has been missed, neglected or deserves attention. This is not a change in the line of inquiry or argument thread.	"So, is intelligence the capacity to learn, like Katie was saying, or is it something you learn how to do?" "But what about what AJ said? How does this fit with that?"

Analysis showed that these moves were used throughout instances of high quality argumentation. Although the facilitators used all seven moves with varying frequency, there was a general concentration in the areas of Paraphrasing, Locating, and Naming Moves. Table 4 shows how the different facilitator moves were distributed across the three facilitators.

Table 4
Distribution of facilitator moves by facilitator

	Distilling	Identifying or Completing a Warrant	Locating	Naming Moves	Paraphrasing	Probing Reasoning	Redirecting
Auth	6	7	12	7	21	7	10
Fac 2	9	1	20	28	15	3	13
Fac 3	4	5	13	11	22	11	3

Although these findings point to a shared repertoire of moves across the three facilitators, individual differences in usage and frequency were present. For example, Facilitators 1 and 3 used Identifying or Completing a Warrant at almost three times the rate of Facilitator 2. Conversely, Facilitator 2 named moves at more than twice the rate of the other two. The resulting variation in move usage could be a consequence of the particular questions explored and/or the groups' dynamics. The variation could also reflect general stylistic differences among the facilitators. Importantly, these differences in the frequency and use of moves did not translate into significant differences in argumentation quality. All three facilitators reached Level 4 argument threads.

What became evident during analysis (particularly of the facilitator interviews) was that facilitation is not simply a matter of executing a set of moves. Facilitators utilized moves to serve important pedagogical functions. Facilitators explained their use of moves in terms that were directly relevant to supporting: the focus of the discussion, the clarity of the collaborative argumentation process, and making progress on the big question. Analysis suggests that a common set of pedagogic principles guided the facilitators work.

Why do facilitators use moves as they do? – Pedagogic Principles

Facilitator interviews both served as a member check of the coding of facilitation moves and allowed me to explore areas of facilitator focus that emerged in the coding of moves. If facilitators used different moves for different reasons, and if a given move did in fact represent motivations that went beyond the move's ostensible function, then understanding how facilitators contributed to argumentation quality could not be determined by a code-based analysis of the moves alone. Consequently, during the facilitator interviews, in addition to reviewing facilitation videos, I explored the underlying beliefs of facilitators.

Research suggests that exploring the facilitator's pedagogical beliefs and principles can offer important insights into why the facilitators used the moves they did (Kagan, 1992; Pajares, 1992). Studies have shown that beliefs provide a general foundation for action (Borg, 2011) and impact teacher decisions (Arnett & Turnbull, 2008; Isikoglu, Basturk, & Karaca, 2009), although the findings are mixed in terms of the strength and consistency of this impact (Basturkmen, Loewen, & Ellis, 2004).

A study by Breen, Hird, Milton, Oliver and Thwaite (2001) offers a helpful framework for examining the relationship between teacher beliefs and practices. This framework is depicted in Figure 2. The authors defined the concept *pedagogic principle* as a kind of principle that derives from the practitioner's more abstract beliefs about teaching and learning and that serves to mediate between these beliefs and their instructional decision making.

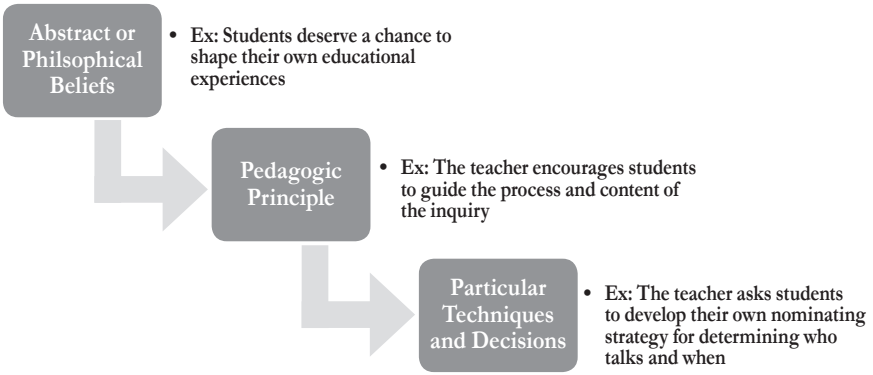

Figure 2
Relationship between beliefs, principles, and moves. Based on Breen et al. (2001, p. 473).

According to this framework, principles are derived from beliefs concerning the more general educational context, including "the nature of language, how it is learned and how it may best be taught" (Breen et al., 2001, p. 472). Principles, in turn, guide decisions concerning specific techniques (such as facilitation moves) and moment-to-moment decisions within a specific context.

Findings from the interviews and shared review of facilitation video reinforce the sense that the facilitators were concerned with clarity but that this was not the only commitment reflected in their facilitation. During instances of Level 4 argumentation quality, the facilitators consistently expressed a concern to keep track of the inquiry, to honor and make progress

toward answering the big question, and to let students drive the process and the inquiry. These concerns guided their use of moves and, as a result, I characterized these concerns as reflecting the following pedagogic principles: track the inquiry, work toward a reasonable judgment, and let the inquiry be student driven.

Tracking the inquiry is a pedagogic principle related to the maxim of "following the inquiry where it leads" often evoked in the literature on P4C (Gregory, 2007; Kennedy, 2013; Lipman et al., 1980; Splitter & Sharp, 1996). The maxim grows out of a normative commitment associated with the pragmatist epistemology that informs the program. Within a pragmatist epistemology, the most reasonable answer or belief that one can hold is the one that has been scrutinized through a clear and coherent process of inquiry and ultimately tested in experience (Dewey, 1997; Peirce, 1955). The epistemological maxim demands that individuals "self-correct" in light of the results of their inquiry rather than arrive at pre-established truths often imposed by an external authority. Thus, in a pedagogical process aligned with this epistemology, the facilitator must track and help the group to follow the inquiry as it unfolds rather than guide it to a particular answer.

To work toward a reasonable judgment reflects a desire to help the group to develop a thoughtful response to their big question. This concern was consistently reflected in the facilitators' explanations of moves and a central belief about the role of dialogue held by all three. This concern represents a desire for more than a high level of argumentation quality or the generation of argument features. It involves pushing deeper into the question or concept to test its limits and implications and go beyond a general survey of opinions on the issue. Facilitators regularly used redirecting, distilling, and paraphrasing to work toward a reasonable judgment.

The principle to *let the inquiry be student driven* seems to work in constant tension with the other principles as it is the principle that keeps a facilitator from taking over the discussion. In a sense, this principle supports the strategic use of all moves, by reminding the facilitator to be measured in their use of moves. In this way, the principle functioned as a kind of meta-principle concerned with how the other principles get activated.

In all cases where facilitator responses reflected these principles, the data also reflected higher levels of argumentation quality (longer threads and more complex argument features). In those cases where quality decreased, these themes were less prevalent and replaced by the facilitator's desire to "explore something philosophically interesting", to organize the discussion via the more general topic rather than the specific big question, or to directly challenge a student claim/argument. When these additional motivations emerged, facilitation moves actually served to shift the discussion toward a new question (and therefore thread), resulting in more and shorter threads

and a reduction in quality. Thus, the interviews reinforced the interpretation that using facilitator moves to attend to clarity of the product and process of an inquiry contributes to argumentation quality, especially in those cases where staying with the initial question is made a priority and students are allowed to push the inquiry forward rather than be guided.

Discussion

Facilitation Moves

Analysis of the transcripts revealed a set of seven teacher moves most commonly made by the experienced facilitators. The identification of moves most directly relevant to instances of quality argumentation is a significant finding not only in the world of pre-college philosophy education but also the broader world of classroom dialogue and argument literacy. This is particularly so because this study provides empirical evidence for several moves previous support for which was criticized as being largely theoretical or anecdotal (García-Moriyón et al., 2004; Reznitskaya, 2004; Trickey & Topping, 2004). This study helped to identify which of the moves from those theoretical and anecdotal sources were regularly used and how they were used to support argumentation. The seven facilitator moves identified in this study represent a refined set of moves that overlap with a number of those found in pedagogical materials from the various approaches. Expanded study of these moves will help to revise and inform those materials while helping to further examine and test the insights they already contain.

Another significant finding of this study is the identification of a facilitation move that does not appear in the existing literature: *distilling*. Instances where facilitators used the distilling move often elicited a direct challenge, but the frequency was not substantial enough to justify this as a finding. This move is unlikely to be unique to the facilitators in this study and deserves further investigation given its possible role in initiating student challenges.

In the literature on approaches to classroom discussion, the focus on moves is widely adopted by researchers because particular teacher moves tend to generate particular student responses (Ford & Forman, 2006; Haroutunian-Gordon, 2009; Jadallah et al., 2010; Mayer, 2012; Sfard, 2008; Wells, 2007). Although examining these move–response relationships is useful, it does not tell us enough about *why* facilitators make the moves they do.

Pedagogic Principles

The analysis of the discussions and interviews suggests that the three facilitators' use of moves was guided by a set of key pedagogical intentions or pedagogic principles. The interviews suggested that the facilitators

consciously engaged these key principles in determining which facilitation moves to make and that doing so improves the quality of argumentation. The prevalence of the principles suggests that professional development in dialogue facilitation should involve more than the introduction and familiarization of facilitation moves. It must also help teachers to understand that the moves are meant to serve more general principles. Teachers' reflection on their own practice needs to involve not only identifying effective moves, but also examining the extent to which their use of those moves resulted in the achievement of underlying pedagogic principles. There is much more about pedagogic principles that future research can help us understand. For example, we need a better understanding of how principles are developed and reinforced in/by practitioners.

Principle: Work Toward a Reasonable Judgement

In addition to supporting the presence and activation of pedagogic principles, the analysis associated with more focused and lengthy discussion threads suggests that one of the principles, to work toward a reasonable judgment, is particularly relevant to argumentation quality. The findings suggest that this is especially the case when the principle is understood as aiming to answer the big question. When facilitators focused on one big question, and helped the group to do the same, argumentation quality increased.

This again has implications for practice in general and professional development in particular. If classroom discussion is being used by teachers to develop argument literacy and if argumentation quality is more conducive to that development, then conceiving of inquiry dialogue as concept exploration rather than working toward an answer to a big question seems to be less effective. This means that a clearly defined sense of inquiry that includes a focus on the big question needs to be adopted as a normative frame for the practice and professional development efforts.

An additional implication of being oriented toward the big question relates back to the issue of core argument features. This study suggests that even though some core features do represent higher levels of argumentation quality (e.g. student generated challenges and responses to challenges), embracing them or initiating them independent of a concern for their contribution to the big question could detract from quality. This was especially the case when challenges were made by the facilitator. Good facilitation involved relating challenges back to the question or problem being resolved. At times, it also meant directing the group away from an irrelevant challenge. This finding conflicts with debate-style approaches that privilege disagreement (challenge) over inquiry.

Facilitator Background Knowledge

In addition to principles, facilitator background knowledge may influence facilitation. All three facilitators reported some level of familiarity with the content of the issues raised during the discussion. Their familiarity was based on academic study of theories relevant to the big questions discussed by their students and their recollection of additional discussions on similar issues. According to all three facilitators, their familiarity with the arguments around the discussed topics helped them to identify important or interesting contributions from students. In the case of one discussion, the facilitator felt his familiarity with the underlying topics led him to manipulate the discussion in ways he later regretted. This suggests that the use of background knowledge by facilitators is a complex issue requiring further investigation.

Limitations

There were a few limitations to this study. The first is that the sample size was relatively small, making it difficult to generalize the conclusions to larger populations. However, the richness of the data helped to offset this limitation. This data represented a valuable opportunity to analyse facilitation and its interpretation by three facilitators with extensive experience and understanding of inquiry dialogue and argumentation. Insights gained from the study are informative for future practitioners, even if not generalizable to all.

My review of the literature made another limitation clear. I was unable to identify any studies that examined facilitator contributions to argumentation. This left me without established methods to inform my own analysis. By using qualitative methods, this exploratory study helped to develop one way of conducting such an examination and produced codes and interpretations that can be tested in subsequent studies.

As this study is exploratory, any causal claims are tentative. Limitations in the data made causal analysis difficult. This was exacerbated by a lack of an established methodology for identifying links between moves and argumentation quality. Future studies using the method on a larger data set will help to establish the trustworthiness of the approach used and increase the strength of any causal claims. This study helped to establish the consistency and reliability of the method, while producing tentative causal conclusions.

Finally, an additional round of member checks could have been used to confirm interpretations associated with pedagogical principles. Although the data and analysis strongly suggested the presence and value of such principles, a more refined and trustworthy account of those interpretations is needed.

Conclusion

To conclude, this study sought to address our limited understanding of how teachers contribute to the quality of argumentation during inquiry dialogue. To learn more about expert teacher's contributions to the quality of student arguments, I conducted a systematic analysis of classroom discussions and facilitator interviews. My findings suggest that the strategic use of a limited set of facilitator moves helps teachers to support argumentation quality. My findings further suggest that the strategic use of moves is informed by the activation of the teacher's pedagogic principles.

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