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RESEARCH REPORT

The Key Practice, Discuss and Debate Ideas: Conceptual Framework, Literature Review, and Provisional Learning Progressions for Argumentation

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In this paper, we provide a comprehensive literature review on the development of key argumentation skills to lay a foundation for a framework of the key practice, discuss and debate ideas, which is centrally involved in the expectations for academic reading and writing. Specifically, the framework includes 5 phases of core activities and related sets of argumentation skills, and for each set of skills, a provisional learning progression is designed to identify qualitative shifts in the development of critical argumentation skills informed by the developmental literature. These learning may have the potential to support teachers' instructional decisions that effectively scaffold their students to the next level.

Keywords Discuss and debate ideas; argumentation; key practice; learning progression; literature review

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In a recent article, Deane et al. (2014) defined a set of 11 key practices for the English language arts (ELA) and illustrated how these key practices help inform the design of scenario-based assessments within the *CBAL*TM research initiative (Cognitively Based Assessments of *of, for* and *as* Learning; see Bennett, 2010). The concept of key practice is grounded in the idea that literacy activities form *activity systems* (cf. Brown, Collins, & Duguid, 1989; Engestrom, Miettinen, & Punamaki, 1999; Spiro, 1988; Vygotsky, 1978), that is, coordinated sets of activities that have clear goal structures and well-established social norms and expectations for participants. An activity system provides tools that participants can deploy while pursuing socially sanctioned goals and helps structure their interactions to facilitate successful performance. We define a *key practice* as an exemplary set of tools, goals, and activities that model successful performance within a literate activity system and that can therefore provide a useful basis for instruction and assessment in a school context.

The major goal of this paper is to outline the theoretical background for and analyze the structure of one of these key practices, discuss and debate ideas. According to Deane et al. (2014), the key practice, discuss and debate ideas involves

mastery of skills and strategies needed to consider an idea from multiple perspectives and build arguments to favor one position over another, whether orally (by participating in discussion and debate) or in written form (by creating, evaluating, and rebutting written arguments). (p. 10)

The core skills in this practice, normally referred to as argumentation skills, are consistent with existing ELA standards frameworks such as the Common Core State Standards (CCSS; available online at <http://www.corestandards.org/ela-literacy>) and with earlier CBAL reading and writing literature reviews (e.g., Deane, 2011; Deane, Sabatini, & O'Reilly, 2013). Our exposition includes a detailed analysis of how argumentation skill appears to develop and provides learning progressions (i.e., tentative maps of skill development) that capture our understanding of developmental patterns in even greater detail. These learning progressions are provisional, subject to revision as we develop our thinking further and gather additional evidence, but they reflect our best understanding of how argumentation skill evolves from relatively simple precursors to complex integrated performances.

The development of argumentation skill is particularly relevant in the post-CCSS environment, because the CCSS place increased emphasis on argumentative reading and writing. In this paper, we describe our efforts to build a unified

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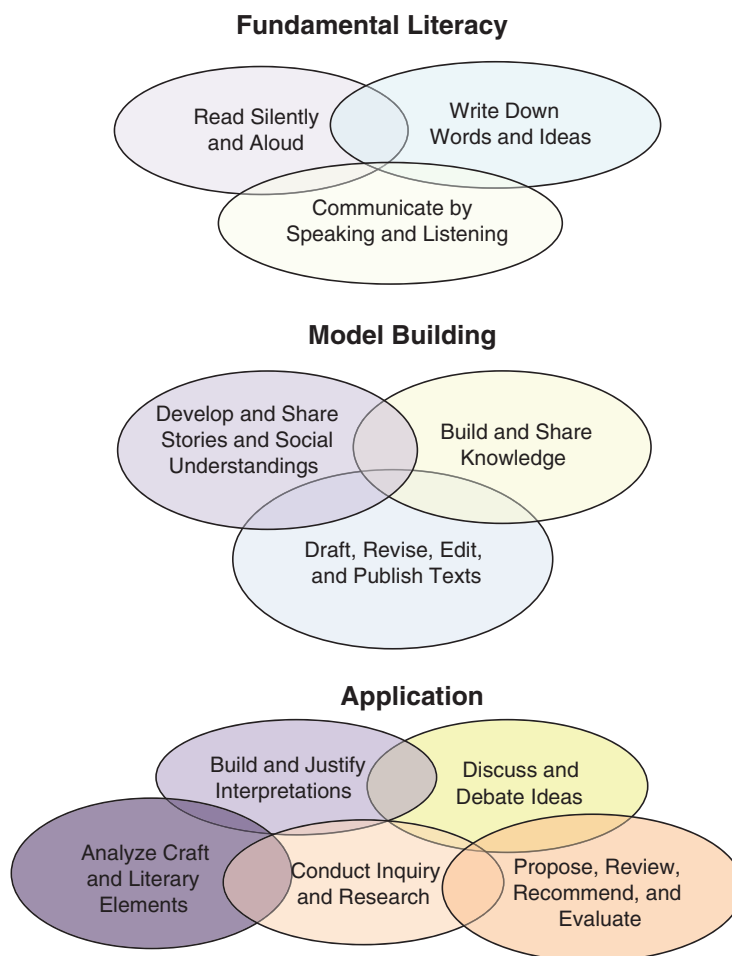


Figure 1 The 11 key practices for the English language arts (ELA).

picture of how students develop argumentation skills, taking into account general developmental trends, the role of social context and discourse, and the value of cognitive-strategy instruction to support development of argumentative reading and writing skills. Ultimately, we seek to identify instructional and assessment practices that support the unfolding of sophisticated argumentation skills. Unlike three previous papers (Deane & Song, 2014; Song, Deane, Graf, & van Rijn, 2013; van Rijn, Graf, & Deane, 2014), which focus on applying argumentation learning progressions to assessment design, in this paper we propose a general framework for the key practice (discuss and debate ideas), review the literature on argumentation skill development, and present revised versions of the argumentation learning progressions developed by Deane (2011).

The key practice, discuss and debate ideas, belongs to the full CBAL ELA framework (see Figure 1), which includes bundles of reading, writing, and thinking skills needed to participate in 11 literacy practices: read silently and aloud; write down words and ideas; communicate by speaking and listening; develop and share stories and social understandings; build and share knowledge; draft, revise, edit, and publish texts; build and justify interpretations; discuss and debate ideas; analyze craft and literary elements; conduct inquiry and research; and propose, review, recommend, and evaluate (Deane et al., 2014). Some of these practices fall into the category of fundamental literacy, which corresponds to ELA skills (e.g., decoding and transcribing) that typically develop in the early years; some practices correspond to model-building skills (e.g., reading and writing about informational and literary text) that become a focus in the upper elementary grades; and other practices are about application of literacy skills in academic and professional discourse (e.g., analyzing and evaluating multiple texts), which are normally emphasized in middle and high schools. The key practice, discuss and debate ideas, in the application category, is centrally involved in the expectations for academic reading and writing.

Discuss and Debate Ideas: Framework for a Key Practice

The set of practices that we term *discuss and debate ideas* combines verbal, social, and conceptual skills to accomplish a wide range of goals—including informal, collaborative goals such as convincing a reasonable critic or working with a group to reach consensus on an issue. In our understanding, argumentation can be conceived best as a kind of *dialectic*—a rule-governed form of discussion in which various speech acts (including assertions, questions, and explanations) are coordinated in the service of social norms for collaborative reasoning (van Eemeren & Grootendorst, 1992). Although the social elements in written arguments may not be explicit, argumentation is best viewed as a dialogue in which participants may take many different positions and change their minds as the dialogue proceeds. Therefore, we do not conceptualize argument as a purely logical exercise or as a purely persuasive exercise.

In the U.S. educational context, the CCSS avoid the word “persuasion,” apparently to emphasize the importance of logical arguments and providing relevant evidence. Previously, the words “argument” and “persuasion” were often used interchangeably, since effective persuasion typically involves the deployment of convincing (and hopefully valid) arguments. However, especially in the context of college and career readiness, the goal is to develop the ability to conduct rational argument, which invokes very different norms than the aim (e.g., in advertising) of making the message appealing to the audience so as to induce changes in behavior, using all available means (Coirier, 1996).

More generally, persuasion can be viewed as one of the most salient purposes for engaging in argumentation. However, argumentation can also be used to accomplish a variety of other purposes, including negotiation, debate, consultation, and resolution of a difference of opinion (Walton, 1992). All of these activities share a common commitment to logically valid argumentation in social contexts in which dialogue with others, and hence attention to their perspectives, plays a critical developmental role.

This understanding is consistent with the literature on the acquisition of argumentation skills (Goldstein, Crowell, & Kuhn, 2009; Kuhn & Udell, 2007; Reznitskaya et al., 2001), which suggests that embedding argumentation in a dialogic context facilitates the development of written argument. For example, Reznitskaya et al. (2001) reported that structured argumentative dialogues lead to more sophisticated argumentation from students, that is, essays containing more relevant arguments and more use of sophisticated elements such as counterarguments, rebuttals, and textual citations. Similar results are reported in Kuhn and Crowell (2011). Thus, it is timely to consider what should be included in the stages of the discuss and debate ideas practice that capture both the cognitive aspect and the social aspect in argumentation.

Paradoxically, the development of argumentation as a literacy skill requires a growing ability to handle ever-more-complex forms of argumentation outside of an oral, interactive context. Effective readers and writers of argument must be able to approach argument in a relatively decontextualized way in which a complex argument is presented as a logical and textual object, with the underlying dialogic structure left implicit. We conceptualize the role of argumentative dialogue in this process as providing the motivation for acquiring the metacognitive awareness necessary for the development of expertise. For example, in the course of a structured argument dialogue, students must internalize the importance of multiple perspectives. This internalization will support strategies that depend on an explicit analysis of alternative perspectives, allowing students to judge the usefulness and potential effectiveness of arguments. Students must address challenges that require them to draw on background knowledge, which will force them to confront gaps in their own knowledge and motivate them to develop strategies for finding useful information. Students may encounter questions and criticism that cause them to rethink their original positions, which may lead them to develop more considered, nuanced strategies for choosing a position to defend. Students may also face rebuttals and counterevidence that force them to develop skills and strategies that enable them to elaborate arguments more defensibly. They may encounter misunderstandings when they present arguments, which will force them to develop strategies for organizing and presenting complex arguments more effectively.

Ultimately, written arguments can become so complex that experts may need to break argument tasks up, defining subgoals that enable them to analyze, develop, and present complex arguments in a series of discrete, relatively manageable steps. This kind of complex planning requires metacognitive awareness of different aspects of argumentation to help define subgoals and strategies. In the case of writing arguments, this strategic control is a special case of what Bereiter and Scardamalia (1987) called a *knowledge-transforming* approach, characteristic of expert writers and a good example of the approach to expertise presented in Scardamalia and Bereiter (1991), where expertise leads to a much more sophisticated approach to defining problems to be solved and developing plans and strategies to solve them, strategies that reduce demands on working memory (Kellogg, 1996).

We contend that the kinds of activities characteristic of expert argumentation can be grouped into five distinguishable phases, each of which focuses on different sets of goals and therefore requires different kinds of reading, writing, and thinking skills, as represented by the questions associated with each phase in Figure 2. The five phases are outlined below, after which we offer an in-depth literature review focusing on each phase in turn.

1. Understand the issue: Context and stakes. To participate in argumentation, individuals must understand the context and stakes, which requires what we will term *appeal building*, for example, knowing how to identify the audience, analyze the audience's interests, beliefs, and values, and select appropriate rhetorical strategies.
2. Explore the subject. To have a meaningful conversation about a topic, individuals must possess and execute effective strategies for learning about a topic, since shallow knowledge leads to ineffective argumentation. This phase corresponds to research and inquiry skills. Participants in an argument need to be clear about what they already know about a subject and what they do not, and carry out effective strategies for obtaining relevant information.
3. Consider positions. Reasoned argument does not start by taking a stand; it informs what stands to take. Experts at argumentation know how to develop their own position while taking alternative perspectives into account. Before taking a position, experts explore multiple lines of argument to evaluate what positions are reasonable and defensible. We will use the term *taking a position* to identify this skill set, although it is important to remember that skilled practitioners take a position informed by thoughtful consideration of alternative perspectives.
4. Create and evaluate arguments. To defend a position, it is important both to present plausible reasons and evidence and to address counterarguments. This phase presupposes the ability to evaluate other people's arguments, for example, by identifying unwarranted assumptions that could undermine the logic. We use the phrase *reasons and evidence* to identify the set of skills that are critical during this phase—a skill set that supports abstract, conceptual reasoning focused on establishing the truth or validity of statements and arguments.
5. Organize and present arguments. When arguments are presented to an audience, they must be embodied in a structured text or discourse. The critical skill set focuses on choosing the best way to structure and present each argument, following genre forms and genre conventions as appropriate, whether in informal conversation or in written text. We use the term *framing a case* to identify the category of skills that enables an individual to organize and present arguments.

For pedagogical purposes, a teacher might require students to undertake each of these five phases in sequence. However, for expert arguers, the process of building an argument is flexible and fluid, which means that the five phases do not necessarily occur in a fixed order. In expert practice, one might start anywhere in this argumentation cycle and proceed in any direction between parts of the process in a recursive, goal-oriented manner. For example, if an argument must be made to a particularly skeptical or unfriendly audience, the task of appeal building may come first and require multiple iterations. Conversely, if someone knows little about the issue under discussion, appeal building may be subordinated to inquiry. Since argumentation is an essentially dialogic process, each phase may recur as an argument unfolds. For instance, it may become necessary to revise the original arguments (perhaps by acknowledging a counterargument and providing rebuttals), after other participants' arguments have been taken into account.

This framework implies that different kinds of skills will be relevant during different phases of argument. Deane (2011) presented evidence that effective argumentation presupposes a combination of social, conceptual, and discourse skills. Roughly speaking, appeal-building skills draw most on the ability to model social situations. Inquiry, taking a position, and argument building draw most upon conceptual reasoning, and framing a case draws most strongly on discourse (textual structuring) skills.

Four of these skill sets are specific to argumentation: appeal building, taking a position, reasons and evidence, and framing a case. Note that we do not include inquiry in the list, primarily because the complex of skills involved can be deployed outside an argument context. Inquiry is better viewed as a key practice in its own right, involving many of the skills discussed in Goldman and Scardamalia (2013). Research and inquiry skills are necessary to argumentation primarily in the case in which an individual is trying to develop arguments in the absence of rich prior knowledge. In what follows, we discuss each of these skill sets briefly, considering what is known about how they develop. This discussion is intended to motivate the framework laid out in the final sections of this paper in which we attempt to sketch a model of how argumentation skill may shift qualitatively as people reach higher levels of sophistication. Insofar as we can, we try to identify key qualitative shifts and specific strategies that may help scaffold higher levels of performance. This progression

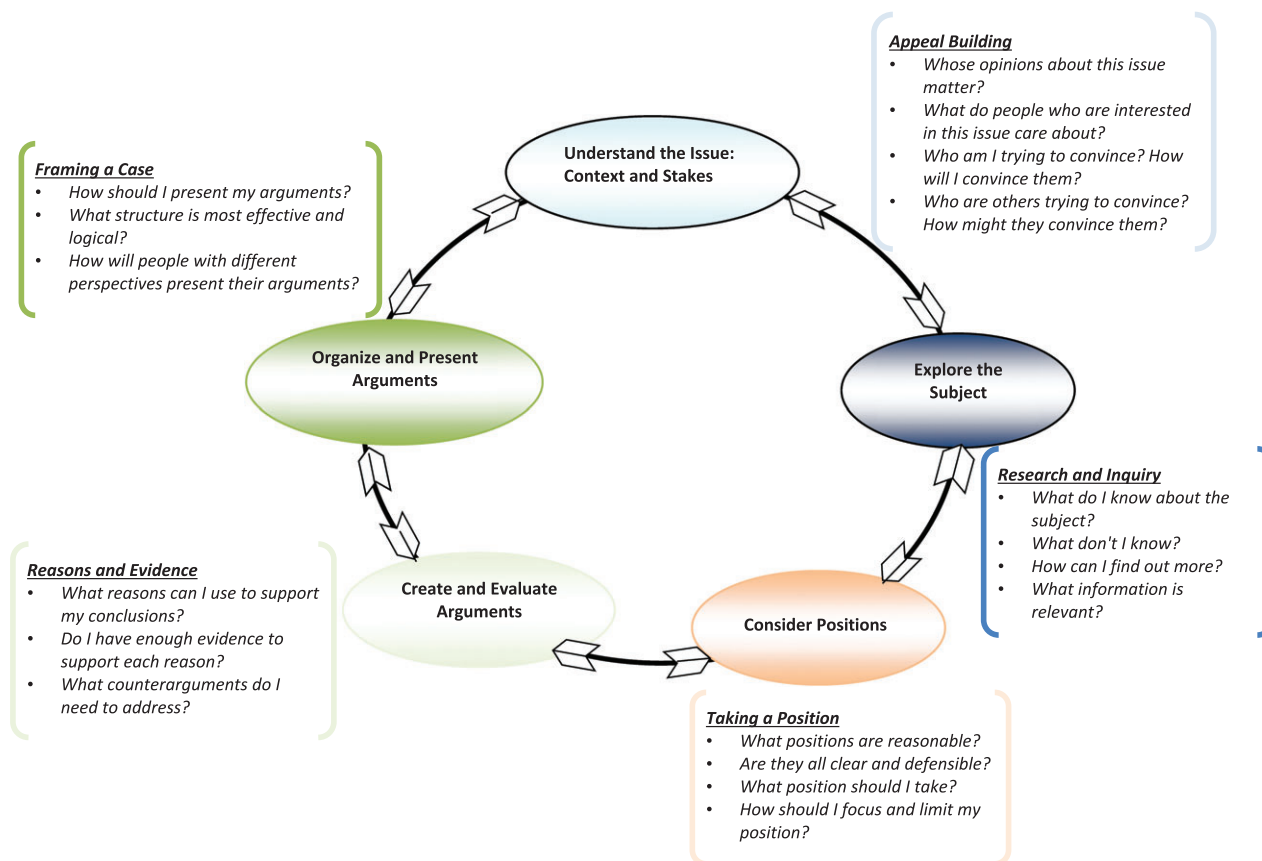


Figure 2 Framework for the key practice, discuss and debate ideas (argumentation).

is then laid out in tables to define our model as precisely as possible. In ongoing work, we are developing a series of example tasks that we believe require different levels of each targeted skill.

What we have developed can be viewed as a kind of learning progression, though not a progression for learning of concepts, as in science (Duncan & Hmelo-Silver, 2009), but rather a progression in skill acquisition in which the development of metacognitive understanding is critical. Our operating definition of a learning progression is “a description of qualitative change in a student’s level of sophistication for a key concept, process, strategy, practice, or habit of mind” (Educational Testing Service, 2012, para. 1). But insofar as the progressions we propose are at a larger grain size than purely conceptual learning progressions, they might better be viewed as hypothesized developmental sequences, following a long tradition in cognitive psychology. Over time, we hope to validate this model through empirical studies; van Rijn et al. (2014) provided an early instantiation. As the work proceeds, we expect to revise and reformulate significant portions of the model, so the specific learning progressions we propose should be viewed as hypotheses that will guide ongoing work rather than an attempt at a definitive statement.

A key feature of our approach is that we try to consider reading and writing in parallel, so that we capture the emergence of literacy capacities as whole skills. We do not think that the ability to make and understand arguments in conversation should be isolated from the ability to read arguments critically in academic text or from the ability to formulate a formal written argument. All of these abilities are related and mutually supportive, consistent with the ideas in the CBAL ELA competency model (Deane, 2011).

Literature Review

Social Aspects of Argumentation: Appeal Building

Appeal-building skills underlying persuasive communication extend well beyond logic and argumentation, given that they are concerned with the interpersonal aspects that are so critical to persuasion. The subject is a venerable one, going back

to such concepts as the three appeals of classical rhetoric (Aristotle, 1939): *ethos* (appeals to authority), *pathos* (appeals to emotion), and *logos* (appeals to logic). Appeal building has been studied extensively from a psychological perspective. Persuasive strategies emerge during childhood and gradually increase in sophistication (Delia, Kline, & Burlison, 1979; Stiff, 2003). As Wilson (2002, p. 15) pointed out, approaches to persuasive communication focus on strategy selection (Seibold & Meyers, 1985) and goal pursuit (Wilson, 1997), though both must be understood in a context of social interaction where the ways in which one person tries to convince another are highly dependent on relationships and social context. The development of persuasive skills appears to be related to the development of theory of mind with older children but not with prekindergarten-age children, showing clear evidence of taking beliefs attributed to others into account when devising persuasive strategies (Bartsch & London, 2000; Bartsch, Wade, & Estes, 2011).

Similarly, in composing argumentative essays, writers need to anticipate the attitudes, beliefs, and arguments of the audience in order to fully engage the reader in the argument (Coirier, Andriessen, & Chanquoy, 1999; Piolat, Roussey, & Gombert, 1999). However, in pedagogical settings, and even in educational standards such as the CCSS, audience awareness or rhetorical strategies do not seem to receive as much attention as they should, perhaps in part due to a desire to emphasize the use of logical arguments and discourage the perception that argument is merely an expression of personal opinion. However, when argumentation takes place outside the classroom, the same argument may not work equally well for everyone. As discussed earlier in this paper, embedding argumentation in dialogic social contexts can facilitate the process of learning how to create logical arguments and make rational judgments.

Studies with elementary and middle school students have demonstrated that students include more argument elements, in particular, opposing positions and rebuttals, if the writing task requires students to elaborate their goals for content and audience during planning and revision. The net effect is an enhancement in writing quality (Ferretti, MacArthur, & Dowdy, 2000; Midgette, Haria, & MacArthur, 2008). Although these are encouraging results, it is important to be aware of the necessarily wide scope and detail required to design instructional strategies that promote audience awareness in written arguments.

We presume that students should be encouraged to consider the intended audience and employ appropriate rhetorical strategies to convince their audience. Otherwise, educators will continue to face the dilemma that students consistently view their teacher as the only audience, because their only goal is to complete the assigned tasks (Bright, 1995). One of the benefits of dialogic approaches to teaching argumentation (Kuhn & Crowell, 2011) may be precisely the fact that a dialogic context forces students to attend to the social dimensions of their arguments.

Conceptual Control of Argumentation: Taking a Position, Reasons and Evidence

Argumentation is in the first instance a skill that develops from the social experience that happens when one person makes a claim and someone else contests it. An entire array of skills evolves in oral situations around the production of arguments designed to back up one's own position or weaken someone else's (Kuhn, 1991; Kuhn & Udell, 2003; Toulmin, 2003). The literature makes it clear that argumentation covers a fairly wide range of skills, some of them quite difficult, such as generating warrants or counterexamples.

The general trend of development is like that for many literacy skills: it begins with embedded, informal skills, for example, interpersonal argumentation with a familiar addressee (Clark & Delia, 1976; Eisenberg & Garvey, 1981). Argumentation skills gradually increase with age and show themselves to best advantage in familiar situations with which the arguer can engage easily (Stein & Miller, 1993). However, many of these skills develop before adulthood only at the upper end of verbal proficiency, with novices often doing little more than generating a plausible explanation and possibly elaborating a few supporting reasons (e.g., Kuhn, Katz, & Dean, 2004). Situations where common ground is lacking appear to present the greatest challenge (Stein & Bernas, 1999). Special education students appear to have more serious problems with argumentative writing than their general education peers (Gleason, 1999; Graham & Harris, 1989a, 1989b). Essays written by students with learning disabilities (LD) or writing problems are in general very short. Some students with LD compose in a narrative style and fail to show any argumentative purpose, such as making a clear claim. They encounter great difficulty in supporting their claims with evidence, in providing logical reasoning and elaboration, and in acknowledging the opposing viewpoint.

But even with students who achieve normally, Kuhn (1991) reported a broad failure to achieve competence in informal argument (nearly half of the subjects in a large study), an observation generally confirmed by the literature (Felton & Kuhn, 2001; Golder & Coirier, 1994; Kuhn, Shaw, & Felton, 1997; Stein & Miller, 1993). On the other hand, the cognitive

capacities that support argumentation, involving metacognitive and metalinguistic awareness, may mature relatively late (Kuhn et al., 2004). However, explicit, focused instruction in informal argumentation does appear to lead to significant gains (Kuhn & Udell, 2003; van Gelder, Bissett, & Cumming, 2004).

As Kuhn (1991) emphasized, the best way to develop argumentation skill is to create interactive situations that make it easy to internalize the social requirements for effective argumentation. In written text, this task is complicated by the fact that readers and writers may never meet; however, the essential requirements are similar, a point emphasized by the account that Coirier et al. (1999) developed to model the kinds of tradeoffs writers must make to mobilize the resources to write a persuasive text. In this account, Coirier et al. postulated that an extended argumentative text is appropriate only when the following elements characterize the social and discourse situation. As summarized in Deane et al. (2008):

1. There is a conflict between different views about the same subject,
2. where the topic's social, ideological, and contextual status make it debatable in the current discourse context
3. and the author has motivation to solve the conflict,
4. in particular, by use of language
5. and has a position or claim to make,
6. which the author can support with reasons
7. and be able to argue against the opposite position
8. by providing counterevidence. (p. 29)

While their account focuses on the management of cognitive resources for someone creating an argument, the centrality of these elements is widely recognized.

Viewed as a form of conceptual reasoning, argumentation includes several critical components: a position, reasons, evidence, alternative perspectives, counterarguments, and rebuttals (Ferretti et al., 2000). Unfortunately, students often fail to include these critical components or present them clearly (Crowhurst, 1987; Freedman & Pringle, 1984; Knudson, 1991; McCann, 1989). Supporting evidence may not be developed sufficiently, so the opinions and reasons may not be supported adequately; students may not recognize or respond to alternative viewpoints (Ferretti, Lewis, & Andrews-Weckerly, 2009). In general, the literature supports the idea that students only gradually develop full control over all the elements of a well-structured argument (Connor, 1996; Erduran, Simon, & Osborne, 2004; Newman & Marshall, 1991; Toulmin, Rieke, & Janik, 1984).

Producing a greater number of elaborated reasons for one's stance certainly results in a stronger argument (Bensley & Haynes, 1995; Ferretti et al., 2000; Gleason, 1999; Graham & MacArthur, 1988). However, students at the beginning stage of learning argumentation tend to provide little elaboration of their reasons. Ferretti et al. (2000) found that many fourth- and sixth-grade students wrote a list of undeveloped reasons to support a stance. It is unsurprisingly ineffective because arguments are a structured constellation of propositions that in sum increase the acceptability of the writer's point of view (van Eemeren, Grootendorst, & Henkemans, 1996).

A number of empirical studies suggest that students in general often fail to consider alternative perspectives, revealing a clear "my-side" bias in their written arguments (Ferretti et al., 2000; Knudson, 1992; Leitão, 2003; McCann, 1989; Nussbaum & Kardash, 2005; Perkins, Farady, & Bushey, 1991). Although older students may have more knowledge of argumentative discourse than younger students, the generation and evaluation of counterarguments were fairly rare at the college level (Nussbaum & Kardash, 2005). It is unfortunate that students produced rebuttals even less frequently than counterarguments (Nussbaum & Kardash, 2005). Lack of strong rebuttals, in fact, undermines students' standpoint and makes their arguments unpersuasive (De La Paz & Graham, 1997a, 1997b; Ferretti et al., 2000; Ferretti et al., 2009; Nussbaum & Kardash, 2005; O'Keefe, 1999). Students often do not realize that considering and rebutting an opposing side can actually increase the strength of their arguments. Some students might have a desire to maintain cognitive consistency (Simon & Holyoak, 2002), whereas others are overwhelmed by high cognitive load in writing (Coirier et al., 1999) where cues from oral discourse are missing (Scardamalia & Bereiter, 1986).

At higher levels of performance, the literature indicates that students may begin to get a working knowledge of how to perform informal reasoning using a variety of argumentation schemes (Walton, 1992, 1996). As argumentation schemes are internalized, students may become able to frame critical questions that enable them to critique other people's arguments or to strengthen their own.

It is important to keep in mind that argumentation is just as critical for reading as for writing, particularly when students are asked to read and integrate documents from multiple sources. In that case, the ability to identify how a text integrates claims, reasons, and evidence becomes critical, because evaluation of sources and integration of information across sources will presuppose the ability to identify and create appropriate representations of argument structure (Goldman, 2011, 2012; Goldman et al., 2013).

In conclusion, empirical data suggest that students who achieve normally are able to state their opinion and offer at least one reason to support their opinion at a fairly early age. Some elaboration and supporting details could be observed in the essays written by students at upper elementary schools, but it is still a challenging task for many older students to warrant their argument sufficiently. Inclusion of arguments from both sides is rare even among older students, and refutation of opposing views appears to be even more difficult. These skills may not develop before adulthood if no instruction or scaffolding is provided.

Discourse Structure, Genres, and Argument: Framing a Case

Argumentation is, however, not merely some capacity for social understanding combined with some degree of control over abstract conceptual reasoning patterns. It is embedded in a larger set of abilities—our ability to use language in discourse. The reasoning skills that are the focus of argument start their life entirely embedded within a social context with its own values and structures, and a failure to understand those values and structures is likely to significantly hinder any attempt to model argumentation.

Even in the upper grades in the United States, student essays are generally poorly organized, although some students are able to structure their text in a five-paragraph template. Students may offer irrelevant information and their reasons and evidence are often loosely connected. Their essays often lack transitions to connect different parts of the text. In general, a majority of students across grades perform below a level considered proficient for their grade (National Assessment of Educational Progress, 1998, 2002, 2007, 2011). One explanation for poorly organized essays is that students lack knowledge of the structure of argument at the discourse level, where the genre structure of argument is critical. Even some college students approach composing by converting writing tasks into telling what they know, that is, simply retrieving topic-related information from memory and writing it down (Scardamalia & Bereiter, 1986). This retrieve-and-write process pays little attention to rhetorical goals, the organization of the arguments, the audience needs, or the metacognitive control of the text (Graham & Harris, 1997; McCutchen, 1988; Scardamalia & Bereiter, 1986). To understand what is involved here, it is useful to consider some general points about how understanding of written genres emerges from simpler forms of discourse.

Move Structure

Swales (1990) postulated that genres are realized as *move structures*—conventional sequences in which the overall purpose of the genre is carried out by successfully fulfilling a series of subgoals. These move structures define characteristic conventional text structures for each genre and, as such, reflect a different kind of cognition than the social reasoning characteristic of persuasion or the conceptual reasoning characteristic of argument (what Deane, 2011, terms the discourse mode of representation). In large part, learning a genre fundamentally involves internalizing such conventional templates, which simplify the planning process by prescribing characteristic organizational patterns (Donovan & Smolkin, 2002; Eggins, 1994; Kamberelis & Bovino, 1999; Martin, 1985; Rose, 2006). For instance, the classic template for an essay requires an introduction with a statement of the thesis to be proven, a series of argument moves designed to support the thesis, and a conclusion (Bazerman, 2007; Flowerdew, 2002; Fulkerson, 1996).

Swales (1990) also postulated that the moves made in producing texts are implemented through the use of rhetorical strategies that reflect specific deployments of linguistic resources. At this level, genre affects the text in terms of the verbal mode—the specific lexical and grammatical choices made by an author. A particular genre or class of genres can evoke a distinctive characteristic style, reflecting register choices and genre-specific deployments of linguistic resources. Acquiring a genre involves acquisition of a complex bundle of characteristic choices both at the micro level (choice of word and phrasing) and at more global levels (characteristic discourse structures and deployment of characteristic conceptual resources; cf. Martin, 1984), even though, ultimately, genre is rooted in communicative purpose and is situated in the activity systems of particular communities of practice. These kinds of strategies are likely to be acquired and understood most easily when readers and writers are embedded in the social contexts that make them meaningful. Given this line

of thinking, dialogic approaches have been found to have an impact on children's development of argumentation skills (Kuhn et al., 1997), because the creation of a dialogue provides the context in which the various moves in an argument make sense, and in which implicit understandings of argument are thus more likely to emerge.

Developing Argumentative Genre Knowledge

Oral Discourse

Given the dialogic nature of argumentation and the powerful impact of social modeling, especially at the younger grades, it is plausible to think that social settings that model effective use of argument are likely to have a significant impact. There is significant support for this idea in the literature. Newell et al. (2011) conducted a major review of the argumentation literature. They concluded that the development of argumentation skill is critically dependent on appropriate social practices that model effective oral argumentation and suggested that teacher training may have a significant impact on whether students are able to internalize the appropriate values and techniques necessary to achieve greater sophistication in argument. Reznitskaya et al. (2001) reported that such interventions do, in fact, appear to result in more sophisticated argumentation from students, that is, essays containing more relevant arguments, and more use of sophisticated elements such as counterarguments, rebuttals, and textual citations.

Reading Exercises

However, where social experience with the precursors of a genre may be lacking, genre knowledge can still develop through exposure to and experience with genre texts, with many children having significant, emergent genre knowledge even before they enter school (Donovan & Smolkin, 2006). In general, students' knowledge of genres increases at all levels of analysis as their experience increases, and there appears to be a fairly strong link between the richness of students' genre knowledge and the richness of their reading and writing experience in those same genres (Applebee, 1978; Chapman, 1994, 1995; Donovan, 2001; Englert, Stewart, & Hiebert, 1988; Hicks, 1990; Kamberelis, 1998; Langer, 1985, 1992; Newkirk, 1987; Pappas, 1991; Purcell-Gates, 1996; Smolkin & Donovan, 2004; Tower, 2003; Zecker, 1999). There is also evidence that perception of the genre to which a text belongs significantly affects the ways in which it is read and comprehended (Langer, 1985, 1992). Zwaan (1991, 1994) found, for instance, that when the same text was read as literature or as news, significant differences occurred in reading rates and the type of information retained.

Explicit Instruction

Although collaborative reasoning promotes the development of argumentation, not every student can learn argumentation skills from a relatively natural setting through conversation and then apply them in various situations, such as writing an essay. Explicit instruction could help students, especially those with LD, refine these skills and use them in appropriate situations.

The most explicit forms of genre-based literacy instruction have for historical reasons primarily developed in the Australian educational system, influenced by the functional linguistics of Halliday (1993). This approach, strongly associated with the work of J. R. Martin (Martin, 1984, 1985, 1992, 1993, 2000a, 2000b; Martin & Rose, 2003, 2005, 2006; Martin & Rothery, 1986), focuses primarily on specifying the move structure and rhetorical strategies of targeted school genres (Bhatia, 1999; Butt, Fahey, Feez, Spinks, & Yalop, 2000; Rose, 2006), in distinguishing among genres using similar criteria (Bondi, 1999; Hyland, 2000), and linking genres so defined with social context (Christie & Martin, 1997). A major emphasis has been the development of pedagogical methods in which teachers help students deconstruct a genre, developing expertise in understanding how texts in that genre are put together and improving reading skill. Teachers model the building of texts in the genre through joint construction of texts, leading to independent construction by student writers (Martin & Rose, 2005).

Advocates of a genre approach to teaching writing argue that it has certain advantages, including forcing engagement with a variety of specific text types, providing specific reasons why particular choices are made in the context of a specific genre, and encouraging attention to the social embedding of genre in specific discourse practices (Hyland, 2003; Kress & Knapp, 1994; Wray & Lewis, 1997). However, the Australian genre school has been criticized as paying too much attention

in its actual pedagogy to formulaic genre patterns, and associated lexical and syntactic patterns, and far less to encouraging practices that enable children to internalize the contexts in which those genres are used in adult settings (Barrs, 1991; Stratta & Dixon, 1994). One piece of evidence that might support this criticism is a recent study by Purcell-Gates, Duke, and Martineau (2007) that indicated a strong effect of authentic reading and writing conditions on learning of science genres but relatively little effect of explicit genre instruction. On the other hand, a study by Reutzel, Smith, and Fawson (2005) indicated a strong advantage for teaching a coordinated set of genre-relevant reading strategies rather than teaching individual strategies in isolation.

A separate line of research, based in the United States, provides independent evidence that children's literacy abilities are powerfully impacted by explicit strategy instruction. Such strategies often take the form of mnemonics and graphic organizers that are similar in important ways to the pedagogies advocated by the Australian genre school. For instance, the Cognitive Strategies in Writing Instruction project (Englert, Raphael, Anderson, Stevens, & Fear, 1991) made heavy use of graphic organizers and lessons on genre conventions as part of a more general strategy designed to give children metacognitive, reflective writing skills and support internalization of a meta-discourse model (Englert, Mariage, & Dunsmore, 2006). However, those elements were most effective when embedded in a sociocultural model, rather than becoming the isolated focus of instruction (Anderson, Raphael, Englert, & Stevens, 1991). These findings have been confirmed in a series of studies, which, while cast as writing strategy instruction have generally involved explicit modeling and teaching of genre structure (De La Paz, 1999; De La Paz & Graham, 1997a, 1997b, 2002; Graham, 1997; Graham & Harris, 1989a, 1989b; Harris, Graham, & Mason, 2006; MacArthur, Harris, & Graham, 1994; Wong, 1997). This line of research is our focus in the sections that immediately follow.

Setting Goals

Writing is a goal-directed activity in which writers need to regulate their behavior in setting goals and choosing appropriate strategies to achieve those goals (Graham, 2006; Hayes & Flower, 1980). When planning their essays, skilled writers actively question and inquire before making decisions about how to best represent this knowledge for the intended audience (Scardamalia & Bereiter, 1986). They also critically evaluate and revise the produced text to maximize the effectiveness of rhetorical goals. Scardamalia and Bereiter (1986) characterized this approach as *knowledge transforming*, which involves a recursive process of knowledge development and knowledge expression (Deane, Fowles, Baldwin, & Persky, 2011). However, novice writers, including many college students, do not engage in self-regulation and goal setting. Rather, they take a *knowledge-telling* approach to composition, that is, putting their ideas into words without any critical thinking about the rhetorical goals, audience, organization, or genre (Graham & Harris, 1997; Scardamalia & Bereiter, 1986). A number of studies have evaluated the use of goal setting as a mechanism for improving student writing of argumentative essays (e.g., Ferretti et al., 2000; Midgett et al., 2008; Nussbaum & Kardash, 2005). These studies found that goal interventions generally have a positive impact on the quality of students' essays, especially if the goals are provided in detail (e.g., a statement of their belief, two or three reasons for their belief, examples or supporting information for each reason, two or three reasons why others might disagree, and an explanation for why those reasons are wrong).

Argumentation Learning Progressions

Given the conceptual framework sketched above and an extensive literature review, we have some preliminary idea of how argument skill develops. Tables 1 – 5 represent an attempt to turn these general considerations into something much more specific that can be used to support a richer, more detailed approach to both instruction in argument and to assessing argumentation skill. Our goal is for the levels in the tables to correspond roughly to major developmental stages we might expect to see in readers and writers. The levels are not strictly tied to age or grade level, though it is useful to reference each level by considering what skills normally developing students might have at different grade levels.

- Level 1 (expected by pre-K to second grade)
- Level 2 (expected by upper elementary)
- Level 3 (expected by middle school)
- Level 4 (expected by high school)
- Level 5 (expected in college or graduate school)

Table 1 Overview Table

Learning progression level	Social		Conceptual: Argument building		Discourse
	Appeal building (understand the issue)	Taking a position (consider positions)	Reasons and evidence (create and evaluate arguments)	Framing a case (organize and present arguments)	
1.	Understands the idea of trying to convince someone by making some sort of persuasive appeal	Understands the idea of taking a side in an argument and accepting or rejecting another person's statements as true or false based on how well one thinks it fits the facts	Understands the idea that positions may need to be supported with reasons that will be convincing to the audience	Approaches argument as a chain of individual turns, and understands and produces such turns in context, such as taking a position or giving a reason	
2.	Transfers the idea of making a persuasive appeal into a written context and does some simple analysis of how oneself or an author might appeal or has appealed to different audiences and interests	Understands and expresses positions in writing with reasonable attention to what one knows and some ability to focus on what is important in the domain	Recognizes, generates and elaborates on reasons in writing, with some awareness of the need for evidence, and uses one's own argument to counter others' argument in an engaging, familiar context	Approaches persuasive text as a coherently organized sequence of reasons supporting a position	
3.	Infers rhetorical structure in texts and builds rhetorical plans of one's own that coordinate multiple appeals and rhetorical moves into a coherent effort to persuade a target audience	Understands and expresses positions clearly, capturing their relationships both to similar and contrasting points of view	Understands use of evidence and clearly grasps the need to provide evidence and reasons that are directly relevant to and support the main point and which are logically sound	Approaches persuasive text as a logically structured presentation of a case with embedded reasons and evidence	
4.	Shows flexibility in interpreting and developing rhetorical plans, with sensitivity to differences among audiences with different points of view	Successfully analyzes unstated assumptions, biases, and other subjective elements in a text and can use that to develop one's own position more clearly	Understands the role of critique and rebuttal and is able to reason about and respond to counterevidence and critical questions	Approaches persuasive text as part of a dialogue between multiple perspectives with appropriate attention to counterpoint and rebuttal	
5.	Displays a well-developed rhetorical (metacognitive) understanding of persuasion	Can use others' arguments to develop one's own understanding and then frame one's own position in terms that exploit the current state of discussion	Builds systematic mental models of entire debates, and uses that model to frame one's own attempts to build knowledge	Displays mastery of many different forms of argument, demonstrating flexible understanding and control of genre features	

Table 2 Hypotheses About the Development of Appeal-Building Skills

Learning progression level	Interpretation		Expression		Deliberation	
	Achievement	Limitation	Achievement	Limitation	Achievement	Limitation
1.	Appeal-1-I-A Infers persuasive intent when not explicitly stated in simple oral or written contexts	Appeal-1-I-L Is reliable only with oral or very short written texts and in familiar contexts; may be unable to explain why inference is drawn	Appeal-1-E-A Generates or modifies appeals to make them more convincing in familiar social contexts	Appeal-1-E-L Accurate judgment of appeal depends strongly on embedding in familiar social contexts	Appeal-1-D-A Can apply ranking strategies that differentiate appeals by their likely effectiveness for different audiences	Appeal-1-D-L Has little or no ability to analyze explicitly why an appeal works
2.	Appeal-2-I-A Identifies textual details that support inferences about persuasive intent and strategy	Appeal-2-I-L May identify details that produce an effect but be unable to explain how or why they work	Appeal-2-E-A Writes texts embodying various forms of audience-appropriate appeals, including appeals to emotion, authority, reason	Appeal-2-E-L May have difficulty coordinating multiple appeals to carry out a persuasive plan	Appeal-2-D-A Can apply simple analytical strategies that map out what a particular audience values or desires, and match appeals to the audience on that basis	Appeal-2-D-L Is likely to make heavily stereotyped assumptions about audience in the absence of direct personal experience/interaction with that audience
3.	Appeal-3-I-A Analyzes how the parts of a text work together to maximize the text's intended appeal	Appeal-3-I-L May not have access to a metalinguistic framework with which to describe how a text builds appeals	Appeal-3-E-A Writes an extended appeal that coordinates multiple appeals by focusing successively on different rhetorical goals and subgoals	Appeal-3-E-L May have difficulty dealing with rhetorically complex situations such as a mixed audience with conflicting interests and values	Appeal-3-D-A Can apply strategies based on considering alternate rhetorical plans and maximizing effectiveness with the intended audience	Appeal-3-D-L May make simplistic assumptions about what will/will not convince an audience
4.	Appeal-4-I-A Analyzes how the appeals in a text will vary in their effects on different audiences	Appeal-4-I-L May lack access to a sophisticated rhetorical metalanguage in which to couch an analysis	Appeal-4-E-A Writes appeals intended to convince a mixed audience, where no single strategy is guaranteed to work	Appeal-4-E-L May not be sensitive to ways in which disciplinary and genre expectations modify the effectiveness of an appeal	Appeal-4-D-A Can use survey or focus group strategies to analyze how different audiences will react to an appeal	Appeal-4-D-L May not be sensitive to different ways similar problems may be framed in different communities
5.	Appeal-5-I-A Accurately identifies from the organization, content, style, and tone of a text what kind of target audience or discourse community it is intended to convince	Appeal-5-I-L n/a	Appeal-5-E-A Demonstrates control of genre and stylistic elements to produce targeted appeals for a variety of literate contexts	Appeal-5-E-L n/a	Appeal-5-D-A Can apply strategies that analyze a discourse to identify the interests and values of its participants	Appeal-5-D-L n/a

Table 3 Hypotheses About the Development of Taking a Position Skills

Learning progression level	Interpretation		Expression		Deliberation	
	Achievement	Limitation	Achievement	Limitation	Achievement	Limitation
1.	Take-1-I-A Infers which side people are taking in an argument based on the reasons or evidence they provide	Take-1-I-L Is limited primarily to simple for/against positions	Take-1-E-A Explicitly states one's own opinion in sentence form	Take-1-E-L Has little or no ability to focus or narrow down a position statement to make it easier to defend, and tends to ignore alternate perspectives	Take-1-D-A Can formulate simple strategies for verifying statements (such as finding a confirming example or trying an idea to see if works)	Take-1-D-L Has limited ability to distinguish statements of fact from statements of opinion, often equating fact with belief
2.	Take-2-I-A Infers a writer's specific position from text details even when it is not explicitly stated in the text	Take-2-I-L May have difficulty tracking who has which belief or perspective, and may confuse actual positions with stereotypes	Take-2-E-A Produces or revises sentence-length position statements so that they narrow down the broad claim with a specific debatable focus	Take-2-E-L May choose positions without first exploring how easy it will be to build a strong case in their favor or in favor of other perspectives	Take-2-D-A Can apply concept-mapping strategies that identify important concepts in the domain and organize one's knowledge and assumptions about them	Take-2-D-L May have trouble distinguishing between one's personal opinions and the common ground shared with the audience
3.	Take-3-I-A Distinguishes an author's position from alternative positions and identifies critical points in need of support	Take-3-I-L May not be sensitive to subjective or implicit aspects of the position	Take-3-E-A Produces an elaborated position statement that indicates important lines of argumentation and contrasts the position being advanced from alternatives	Take-3-E-L May be too strongly committed to one's own perspective and fail to see where one is making assumptions and subjective evaluations	Take-3-D-A Can apply analytical strategies that distinguish and map out common ground, factual disagreements, and contrasting opinions on a topic	Take-3-D-L May tend to reduce opposing viewpoints to straw men or caricatures
4.	Take-4-I-A Identifies those parts of a thesis or other statement that imply an opinion or presuppose a subjective point of view (assumption)	Take-4-I-L May have difficulty evaluating the plausibility or significance of a thesis in the light of specific disciplinary frames	Take-4-E-A Formulates or revises a thesis so that it presents a well-defined, debatable proposition, including alternative perspectives	Take-4-E-L May not be able to clarify the significance of the thesis in the light of a larger discourse or to anticipate some alternative perspectives motivated by that larger discourse	Take-4-D-A Can apply strategies that use subjective language to locate unstated assumptions and make them explicit	Take-4-D-L May have difficulty distinguishing between assumptions and those provide a disciplinary common ground
5.	Take-5-I-A Analyze the plausibility of a thesis in terms of the availability of effective arguments and fit with prior knowledge	Take-5-I-L n/a	Take-5-E-A Frames a thesis to preclude alternative perspectives while indicating its significance in the light of a larger discourse	Take-5-E-L n/a	Take-5-D-A Can apply strategies that survey an ongoing discourse to identify unresolved issues and formulate key questions	Take-5-D-L n/a

Table 4 Hypotheses About the Development of Reasons and Evidence Skills

Learning progression level	Interpretation		Expression		Deliberation	
	Achievement	Limitation	Achievement	Limitation	Achievement	Limitation
1.	Reason-1-I-A Identifies reasons people give to support a specific point	Reason-1-I-L May be limited to atomistic comprehension, showing little global understanding of the overall case	Reason-1-E-A Generates at least one reason to support a specific point, in sentence form	Reason-1-E-L May display an unselective and additive approach, generating arguments based primarily on most obvious points of attack	Reason-1-D-A Can apply template-based argument-generation strategies (such as making lists or filling in a pro-con chart)	Reason-1-D-L May deploy only a narrow range of argument schemes, thus limiting the quality of generated arguments
2.	Reason-2-I-A Identifies supporting reasons or evidence in a written text and relates them to the point they support	Reason-2-I-L May have only a minimal understanding of evidence; anything that seems loosely relevant to the point may be viewed as providing support	Reason-2-E-A Generates and elaborates multiple reasons to support a point, and uses these reasons to counter others' argument in an engaging, familiar context	Reason-2-E-L May have only a limited ability to evaluate or provide supporting evidence, exercising it only in response to specific questions, or instructions, or objections	Reason-2-D-A Can apply analytical strategies to identify information needed to support a point, reflecting implicit understanding of common argument schemes	Reason-2-D-L May have an entirely implicit understanding of argument, with little metacognitive control over the process of building or evaluating an argument
3.	Reason-3-I-A Recognizes and explains the relationship between main and supporting points and keeps track of which evidence supports which point	Reason-3-I-L May not see flaws in elaborated arguments and so find them overly plausible	Reason-3-E-A Builds logical, hierarchically structured arguments by selecting and arranging reasons and evidence to support main and subsidiary points	Reason-3-E-L May fail to recognize critical questions which must be addressed in order to make a reasonable argument	Reason-3-D-A Can evaluate the strength of evidence and distinguish sound and unsound arguments by recognizing common syllogisms and fallacies	Reason-3-D-L May significantly overestimate the strength of evidence and arguments with which one agrees
4.	Reason-4-I-A Identifies specific points in a text that are vulnerable to objections and counterarguments	Reason-4-I-L May not be adept at selecting the most important questions and objections to address	Reason-4-E-A Writes simple critiques or rebuttals that critically provide summaries of or responses to other people's arguments	Reason-4-E-L May miss problems and issues that are highlighted in prior discussions but not in the current situation	Reason-4-D-A Can apply critical-question strategies for commonly used argumentation schemes to generate counterarguments and determine how to reinforce specific points	Reason-4-D-L May not have explicit knowledge about argumentation schemes and critical questions to systematically evaluate strength of arguments
5.	Reason-5-I-A Evaluates arguments in light of existing knowledge and discussions, actively verifying, challenging, and corroborating the case using a larger literature for reference	Reason-5-I-L n/a	Reason-5-E-A Writes extended discussions and critiques that place arguments in the context or a larger literature or discourse	Reason-5-E-L n/a	Reason-5-D-A Can apply argument-mapping strategies to model the structure of an ongoing debate	Reason-5-D-L n/a

Table 5 Hypotheses About the Development of Framing a Case Skills

Learning progression level	Interpretation		Expression		Deliberation	
	Achievement	Limitation	Achievement	Limitation	Achievement	Limitation
1.	<p>Frame-1-I-A Distinguishes between appropriate and inappropriate moves in an argumentative conversation</p> <p>Frame-2-I-A Identifies topic or thesis sentences and correctly interprets interclause relations marked by explicit connectives</p>	<p>Frame-1-I-L Is unable to explicitly analyze appropriateness of moves; may ignore connectives and merely interpret sentences additively</p> <p>Frame-2-I-L May have only a fragile recognition of topic and thesis in an argumentative text, being overly sensitive to surface features</p>	<p>Frame-1-E-A Responds to contextual cues to produce some of the standard moves in an argument</p> <p>Frame-2-E-A Writes short persuasive texts that carry out all the key moves in an argument in a logical sequence, using appropriate connective words</p>	<p>Frame-1-E-L May not generalize to written tasks</p> <p>Frame-2-E-L May have only a template-oriented grasp of argumentative text structures and be unable to generalize to support flexible comprehension or planning</p>	<p>Frame-1-D-A Can apply strategies that use peers as conversational partners to stimulate the production of arguments</p> <p>Frame-2-D-A Can apply strategies that use connective words as cues to stimulate thinking and support elaboration on a specific point</p>	<p>Frame-1-D-L Has limited sense of focus, often losing the thread rather than following up on previous points or questions</p> <p>Frame-2-D-L May have only a limited understanding of argument structures behind the connectives, leading to inappropriate elaborations</p>
3.	<p>Frame-3-I-A Infers the thesis and topic outline of a well-organized, explicitly structured essay</p>	<p>Frame-3-I-L May be misled by surface cues and insensitive to structural relationships implied by content alone</p>	<p>Frame-3-E-A Writes multiparagraph essays with appropriate transition markers and other macrostructural cues, including appropriately structured thesis and topic sentences</p>	<p>Frame-3-E-L May rely on a small set of one-size-fits-all templates rather than varying the rhetorical structure to fit the kind of argument being made</p>	<p>Frame-3-D-A Can apply outlining strategies that support planning and revision by mapping an argument into an explicit external representation of text structure</p>	<p>Frame-3-D-L May tend to commit early to one structure and stick with it even if it does not work out well</p>
4.	<p>Frame-4-I-A Infers and restates the argument structure of a text, even when it is not explicitly marked</p>	<p>Frame-4-I-L May not make appropriate inferences when text structure situates a document in an ongoing literature or discourse</p>	<p>Frame-4-E-A Demonstrates control of a variety of persuasive and argumentative organizational patterns selected to suit particular audiences and purposes</p>	<p>Frame-4-E-L May not have mastered the full range of genres needed to participate effectively in professional and academic communities</p>	<p>Frame-4-D-A Can apply editing and revision strategies that include the consideration and evaluation of alternative ways to organize an argument</p>	<p>Frame-4-D-L May be insensitive to usefulness of particular text structures and in specific disciplines or contexts</p>
5.	<p>Frame-5-I-A Uses knowledge of specialized genre structures to scan and rapidly reconstruct the author's argument and role in a larger discourse</p>	<p>Frame-5-I-L n/a</p>	<p>Frame-5-E-A Demonstrates control of a variety of specific argument structures and organizational patterns appropriate to particular topics (history, literature, etc.) and contexts (scholarly, popular)</p>	<p>Frame-5-E-L n/a</p>	<p>Frame-5-D-A Can apply strategies that take advantage of genre structures to identify dialogical relationships across texts in an extended discourse</p>	<p>Frame-5-D-L n/a</p>

The general model (see Table 1) presents an overview of how social, conceptual, and discourse skills relevant to argumentation shift qualitatively as people reach higher levels of sophistication. Then each of the detailed models (Tables 2–5) provides specific descriptors for each strand of skills, which includes three progress variables: reading (interpretation), writing (expression), and critical thinking (deliberation) to show how these variables develop in parallel. In addition, the detailed tables not only specify what students are able to accomplish in these areas at each level, but also identify potential limitations, that is, how each level falls short of the next.

Metacognitive as well as epistemological development is critical to the progressions as we have stated them. The literature indicates three major qualitative changes in the ways students conceive of argumentation (Kuhn, Iordanou, Pease, & Wirkala, 2008):

1. from presenting claims as a personal belief with no need to provide proof (i.e., knowledge as certain) to supporting claims with reasons and evidence (i.e., knowledge as subject to evaluation);
2. from ignoring or dismissing alternatives (i.e., knowledge construction as accumulative and fixed) to acknowledging and responding to alternatives (i.e., knowledge construction as ongoing seeking of reconciliation of conflicting claims); and
3. from using unjustified evidence and overestimating the strength of one's own evidence (i.e., evidence as personal experience) to integrating evidence from both sides (i.e., evidence as public and subject to re-examination).

In short, as students develop high-level argumentation skills, they view knowledge construction as a continuing process that integrates multiple perspectives as well as evidence for conflicting ideas.

As we note above, the learning progressions presented below are provisional in that we expect to begin validating (and modifying) them in future work. They are intended, to the extent possible, to serve multiple purposes: as a description of major cognitive stages along a developmental continuum, as a framework for assessing where students are in their argument-related skills, and as a sketch of how one might go about scaffolding argument-related skills in a step-by-step fashion for instructional purposes.

Conclusion

In this report, we have proposed a framework for the key practice, discuss and debate ideas, which involves five phases of core activities and related sets of targeted skills. Then we provided a comprehensive literature review on the development of the key argument skills, which lays a foundation for producing a set of provisional learning progressions. Although those hypotheses are strongly based upon the literature, there are gaps in the literature, and other factors could influence the learning progressions for individual students. Empirical data need to be collected to verify the learning progressions. We have developed a large pool of assessment tasks aligned to the learning progressions and are collecting pilot data to observe whether the performance patterns recover the general model and progress variables. If our hypotheses are confirmed, we will be able to use them to interpret student performance and, thus, to improve and support both assessment and instruction.

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