ISSA Proceedings 1998 – The Importance Of Being Argumentative: Designing Disagreement Into Teaching/Learning Dialogues

The single most important thing to know about the pragmatics of argumentation is that argumentation is a kind of conversational expansion, a form of repair that kicks in when triggered by a special sort of event. Discourse occurs before a very dense backdrop of assumptions, assertions, and implications, not all of which can be examined for their acceptability or justifiability. Whenever any of us speaks, we evoke for our hearers an indefinitely expandable context of belief and claim, any part of which may be called out and made arguable. Most of what we say, and especially most of what we evoke, passes without close examination.

This willingness to let things pass without examination, though essential to the organization of conversation, is antithetical to what is commonly called "critical thinking." In educational contexts, at least, we might suppose that what we want is for students to be constantly engaged in reviewing each proposition advanced and considering whether it is to be believed or not. Realizing, however, that a speaker's "standpoint" is not simply what is asserted but also what must be believed in order to have made that assertion and to have made it in the circumstances in which it was made, we see that it is not in fact possible for students to inspect everything. Like all of us in all contexts, they must pick and choose among propositions to examine. In the classroom as in conversation, most statements pass without inspection.

This paper is about designing discourse for the support of argumentation, both in the sense of stimulating its occurrence and in the sense of regulating its conduct. Argumentation is valuable in educational contexts, and although I do not expect this point to be controversial, I will begin by reviewing in the first section some of what is known about the relationship between argumentation and learning.

Unfortunately, however valuable argumentation may be, it is also interpersonally complex, implicating not just our beliefs about impersonal things but also our "standing concerns" for identity, status, and relationship (Jacobs, Jackson, Stearns & Hall 1991). In status-marked settings like the classroom, these interpersonal complexities can create intractable dilemmas for the structuring of argumentation, a point to be elaborated briefly in the second section of the paper. Employing a design methodology described briefly in the third section of the paper, I will describe several explicitly theorized plans for the incorporation of argumentation into teaching and learning. In this respect, the present paper is an instance of the form of practical research my colleagues and I championed in Reconstructing Argumentative Discourse (van Eemeren, Grootendorst, Jackson & Jacobs 1993): research organized by the search for argumentation procedures that take into account the situation of argumentation within real-world constraints and limitations.

1. Contributions of Argumentation to Learning

Argumentation here refers not to preparation of an essay or speech that makes a case for a proposition, but to critical engagement in dialogue or dialectic – an interactive, collaborative process. Since the publication of Toulmin's landmark study *The Uses of Argument* (1958) theorists have recognized that argumentation unfolds as an answer to questioning, doubt, or contradiction. In contemporary argumentation theory (van Eemeren & Grootendorst 1983; Willard 1989), central importance is assigned to interaction and to the social context in which it occurs. Argumentation's interactional function – the resolution of disagreement – demands discourse forms in which anything that might be contested can be "externalized" and addressed (van Eemeren, Grootendorst, Jackson & Jacobs 1993). Argumentation expands around disagreement (Jackson 1987; Jackson & Jacobs 1980).

Argumentation is known to contribute to learning across a broad spectrum of educational levels and subjects (Bruffee 1992; Kuhn 1993; Kuhn, Shaw & Felton 1997; Pontecorvo 1993; Meyer & Woodruff 1997; Voss 1991; Zeidler 1997). Argumentation stimulates deeper processing and more critical thinking, and when it is incorporated into instruction it helps students learn. For example, Kuhn, Shaw, and Felton (1997) developed a teaching/learning design in which students met and engaged in discussion on a single topic with peers holding diverse positions over a 5-week test period. As compared with a control group that only had to state an opinion on the topic and write a justification of their opinions at

the beginning and at the end of the experimental period, the group engaging in argumentation with others achieved superior topical insight and superior argument quality.

What accounts for the difference in learning? More is involved than the effect of thinking about the topic and writing about it. All students went through these processes. Kuhn et al. did not simply sort students into random pairs but arranged the dyads so as to guarantee encounter with a wide range of discrepant and congruent positions, so that students would be sure of meeting disagreement. Other designs that putatively rely on argumentation, but that fail to ensure controversy, have not had the same effect on learning. For example, Marttunen (1992) found instruction organized around comment on written argumentation to be less effective than "traditional" instruction, but since no mechanism was provided to assure clash of viewpoints, the argumentation design may have omitted its active ingredient.

We know that encountering disagreement stimulates the search for fallacy and other weakness in argumentation, that people are much more competent at evaluating arguments for conclusions they disagree with than at evaluating arguments for conclusions they agree with. Experimental research on "biases" in reasoning (Klaczynski 1996, 1997) has shown that the quality of reasoning and evidence is unlikely to be thoroughly evaluated if the conclusion happens to be congruent with one's own beliefs. By contrast, disagreement stimulates the search for what is wrong in others' reasoning and what is needed to bolster one's own reasoning against challenge (Jackson 1996).

Ideal models of argumentation (e.g., van Eemeren, Grootendorst, Jackson & Jacobs 1993) treat the externalization of contradiction and the expansion of discussion around points of contention as fundamental to rationality. To encourage pervasive occurrence of argumentation, our first requirement is to provide for externalization of disagreement. Contradiction and confrontation should be emphasized and exploration of the grounds for belief and disbelief should be expanded. Externalization is not simply a matter of requiring that students write position statements of their own, but a matter of guaranteeing that each student wrestle with positions discrepant from their own. This will be a key feature of every successful design for argumentation in learning.

2. The Interpersonal Complexity of Argumentation

So why not simply contradict everything students say in the style of Monty

Python? Unfortunately, merely confronting speakers with contradictions does not assure critical discussion. (Yes it does. No it doesn't.) The possibility of critical discussion is also known to rest on various levels of preconditions, including most obviously the abilities and motivations of the arguers and the social and political circumstances surrounding the argument.

Conditions known to threaten critical discussion include artificial limitations on participation, limitations in individual ability, personal identity concerns, and hierarchical social relationships-all of which play prominent roles in classrooom communication. Participation in classroom discussion is generally infrequent and uneven at the postsecondary level (Karp & Yoel 1976; Nunn 1996), with a few individuals accounting for the bulk of student contributions. While the overall level of student participation is linked to instructional design decisions, which individuals in a group participate is linked to gender, self-confidence, and other individual difference variables (Fassinger 1995). Social norms may inhibit expression of controversial opinions or extended argumentation (Fassinger 1995; Lusk 1994), while deference to the authority of the teacher may suppress the occurrence of disagreement or lead to premature closure of debate.

In other words, argumentation is interpersonally complex, having not only intellectual dimensions but also highly-charged relational dimensions. Disagreement is often experienced as threatening, especially under conditions of unequal power or authority; contradiction or challenge by authority figures often simply closes down discussion. Among peers, argumentative exchange has a competititive quality that can make it difficult for arguers to change their minds once committed to a position.

Some of these threats can be handled through sensible design decisions, whether in traditional classrooms or in virtual environments. For example, the dyadic argumentation procedure developed by Kuhn et al. was designed to guarantee controversy by pairing students with others holding discrepant views, and it was further designed to minimize deference by forming peer dyads rather than teacher-student dyads. Knowing that specifiable characteristics of the social situation may suppress argumentation, we can design those characteristics out of the interaction, using whatever resources come to hand. To the extent that interpersonal complexity threatens the occurrence or quality of argumentation, the successful integration of argumentation into teaching and learning will depend on management of its interpersonal complexity.

3. Design Methodology within Normative Pragmatics

We might or might not be able to make students indifferent to authority, identity, and peer pressure. Normative pragmatics accepts the circumstances of ordinary discourse and searches for ways to regulate their impact on argumentation, employing a design methodology adapted to its general theoretical program (van Eemeren, Grootendorst, Jackson & Jacobs 1993). Normative pragmatics approaches the study of argumentation empirically, but with questions motivated by normative considerations and with analytic tools tailored to criticism and intervention. Argumentative practices are examined with an eye to their improvement. The blending of empirical and normative considerations is made explicit in our design methodology.

This design methodology has four components: an empirical examination of discourse practices, a critical analysis based on comparison of practices with an ideal model, a specification of designable features, and a proposed redesign.

Empirical analysis of discourse practices is aimed at developing conjectures about participant goals and about the obstacles participants face in accomplishing these goals. Often this analysis involves direct inspection of records of interaction, but empirical analysis may also extend to experimental investigation of communication behavior and outcomes. In the present case, our focus is on the occurrence of argumentation and on the impact of its occurrence on learning. This being a topic of very active concern, there is a rich literature that documents such facts as the uneven application of critical standards to congruent and discrepant positions, the general social inhibitions against disagreeing, especially with authority, and the unevenness of participation from student to student. In other contexts our central concern might be for management of relevance or for regulation of the impact of authority; in the discourse of teaching and learning, our first concern is for conditions that limit the very occurrence of argumentation. Neither our participants (teachers and students) nor the conditions under which they interact are ideal. In ideal critical discussion (van Eemeren, Grootendorst, Jackson & Jacobs 1993), arguers engage in full, free, and impersonal exploration of potential disagreement without limitations on either total talk time or rights to speak. In ideal critical discussion, the contestability of every proposition is fundamental and participants are expected to shoulder a “burden of rebuttal” rather than to let potentially controversial points pass. Not all classroom discussion falls far short of this ideal, but much does.

A specification of potentially designable features will normally be grounded in comparison of actual empirical circumstances with conditions defined by ideal models. Against an ideal standard of full, free, impersonal explorations of ideas,

certain features of the classroom situation present themselves as possible "culprits": finite talk time, unequally distributed speaking rights, unequally distributed authority, identity-relevance of speech, and so on. From these noticed features we begin the process of designing discourse to encourage rather than discourage argumentation. To the extent that they are malleable, we can alter them through design and document the result.

Gaps between ideal models and actual practices present opportunities for engineering of argument. We search for ways to eliminate, compensate, or work around design features that promote bad practices and to inject or emulate design features that promote good practices. In the discourse of teaching and learning, with a first objective of simply increasing the occurrence of argumentation, we must find ways to minimize the impact of authority and identity, and also, of course, scarcity. One of many ways to do this is through invention of what we are calling 'discussion protocols.'

4. Argumentation Protocols for Teaching and Learning

The trick in designing plans for argumentation in instruction is to preserve argumentation's cognitive advantages while managing its interpersonal complexities. Let's begin by trying to devise an all-purpose argumentation protocol to use in teaching physics. The role of argumentation will not be to arrive at resolution of disagreement, but to exploit disagreement to induce deeper thinking about problems whose answers are known. So presumably what is wanted is a method for moving a student from a wrong answer to a right answer through exposure of incorrect assumptions or faulty reasoning.

A useful device that meets this challenge is the 'confrontation sequence' in which less sophisticated ways of thinking are brought into confrontation with predicaments that call for more sophisticated reasoning. In a confrontation sequence (Bleiberg & Churchill 1975; Jacobs 1986), one speaker (the confronter) helps another (the confronted) to recognize weaknesses or self-contradictions by calling out commitments one at a time and juxtaposing those that are in contradiction – a straightforward dialectical structure. The confrontation sequence has three 'stages': an opening in which some statement triggers a decision to confront; an exploration in which question/answer pairs or challenge/response pairs establish commitments; and a punchline or predicament in which the confronter draws out the contradiction or inconsistency in the confronted's various commitments.

1. Statement

2. Exploration (Challenge/Response, Refutation/Concession, Question/Answer)
3. Predicament

Confrontation might prove very useful in teaching if deployed in such a way as to bring less sophisticated ways of thinking into dilemmas that motivate progression to more sophisticated reasoning. However, by its very design the confrontation sequence exacerbates the conditions that seem to suppress the occurrence of argumentation in the classroom. Its oppositional structure is corrective rather than collaborative, and the final predicament, the punch line, puts the confronted 'on the spot,' compelled to respond and unable to do so without repudiating something previously asserted. The classic confrontation subjects a student's reasoning to public critique and potential loss of face.
The feature we want is opposition. The features we don't want are the face implications associated with being in the public role of the confronted – what an interaction analyst might call a 'one-down' position. A skillful teacher can find ad hoc strategic solutions to how to confront without face threat, but it is also possible to design structures of this kind that are independent of the skill of the confronter.
My own design work has depended heavily on computer mediation of dialogue. Computer mediation allows for asynchrony in interaction (meaning that people can engage in conversational exchanges without being in the same place at the same time) and for a high degree of individualization (meaning that what a teacher says to students can be tailored differently to each one). However, for purposes of managing the interpersonal complexity of argumentation, the most important attribute of computer mediated communication is that it allows for anonymity. Students can be engaged, through interactive computer technology, in argumentation with anonymous others whose characteristics are known only through what they write or through what is written about them.

One of my tasks at the University of Arizona over the past several years has been to design tools to support instruction on the worldwide web, and in particular to design tools that allow for incorporation of argumentation into web-based instruction. I've createdand implemented a web course authoring system known as POLIS, most of whose capabilities are not relevant to the present discussion. What is relevant within POLIS is the repertoire of argumentation protocols offered to instructors to assist them in using argumentation effectively. Instructors in any subject use POLIS to create online argumentative dialogues for

students to use as “lessons.” Shortly I’ll have to produce evidence that the POLIS repertoire has measurable impact on learning; POLIS is collecting data on itself every time an instructor creates an online lesson or a student submits a response to it. What I can give so far is a progress report on the creation of the learning protocols themselves.

Unlike otherwise comparable systems of web authoring tools, POLIS is highly theorized. Its protocols can be described structurally in terms of speech act sequences, and the structures it generates are heavily influenced not only by speech acts theory but also by those strands of discourse analysis that have been concerned with conversational sequencing and conversational expansion. I want to describe and contrast three POLIS protocols (Recitation, Adversary, and Virtual Peer) to illustrate the way in which features known to affect argumentation can be managed at a structural level. (The entire web kit is open to public examination at http://emma.comm.arizona.edu.)

Standard classroom recitations have three moves: question, candidate answer, and assessment. The teacher poses a question, a student answers, and the teacher either affirms the answer or, if it is incorrect, offers a correction. The most interesting answers are the wrong ones; those are the opportunities a teacher could use to initiate confrontations or other more obviously argumentative processes. POLIS makes a very slight improvement over the standard form of recitation, presenting not an authoritative assessment but a “model answer” which the student uses to make a self-assessment. So the POLIS Recitation have four moves: question, candidate answer, model answer, and self-assessment. Notice how this minor variation affects the overall quality of the exchange: the standard recitation closes the sequence with assertion of an authoritative answer, while the POLIS Recitation invites expansion around any difference between the submitted answer and the model answer. Though not designed specifically for argumentation, the POLIS Recitation illustrates an important point about protocol design, that the interactional sequence and the framing of contributions might matter.

POLIS offers a much more explicitly argumentative protocol, known simply as Adversary. Adversary builds and conducts online debates with students. It has a minimum of six moves:

1. Statement of controversy (by teacher, via POLIS)
2. Statement and defense of [initial] standpoint (by student)
3. Statement and defense of opposing standpoint (by POLIS)

4. Rebuttal of opposing standpoint (by student)
5. Invitation to reconsider (by POLIS)
6. Statement and defense of [terminal] standpoint (by student)

The two middle turns, a counterargument/rebuttal pair, can be repeated for additional counterarguments. POLIS selects what to present at that step using the student's initial position as data. Adversary is an automated system and (because it is built to deal with any subject, not with some fixed body of content) it has no knowledge base to use in planning its contributions. Its opposing arguments are chosen from a store supplied by the teacher or by previous students. However, it allows for an online simulation of the sort of experience students might have had in the Kuhn et al. experiment reviewed earlier. Students are presented with one or more arguments against their own initial positions and must answer these before making a final decision on the controversy. Important features to notice are the open-endedness of the sequence (no suggestion that the controversy is in fact settled) and the use of disagreement per se to motivate deeper reflection on the controversy.
In use, Adversary appears to function also as a kind of modelling exercise for students; their defenses of their initial positions frequently give elaborations of their personal beliefs rather than justfications for those beliefs, but when presented with models of argumentation in the counterargument passages they quickly accommodate to the normative requirements of the exchange.
The last of the three protocols considered here is modelled after a very sophisticated design used in physics instruction (Mazur 1997). In its classroom version, argumentation takes place synchronously between peer dyads within a large group. The teacher presents a problem, each student develops an individual answer and then tries to persuade a neighbor that their answer is correct, and then the correct answer is shown and explained.

The online version within POLIS, known as Virtual Peer, differs from both Recitation and Adversary in terminating with a correct answer to a question. It has a minimum of seven moves:
1. Statement of problem (by teacher, via POLIS)
2. Candidate answer and explanation (by student)
3. Proffering of alternative answer/explanation (by POLIS, presented as peer reasoning)
4. Response to peer reasoning (by student)

5. Invitation to reconsider (by POLIS)
6. Final answer and explanation (by student)
7. Presentation of correct answer and explanation (by POLIS)

Again, the middle subsequence is selected for discrepancy with student's own position, and it can be repeated as many times as necessary to work through all of the alternative positions presented to students at the first step. Virtual Peer is explicitly argumentative, despite the existence of a correct answer known in advance. This protocol more than any other draws attention to the role argumentation can play in teaching and learning, forcing deeper examination of the reasoning behind even correct answers. Students who get the problem right on the first try have the same sequence of argumentative tasks as students who get the problem wrong on the first try. And importantly, this is framed in such a way as to carry no implication that the counterconsiderations are reasonable: Students get discrepant positions represented as what another classmate argued. (Compare this with another common strategy for probing the reasoning behind a correct response: Devil's advocacy by the teacher.)

Even in online protocols, it should be noticed that interpersonal considerations must be managed. Recitation and Virtual Peer differ most significantly in the framing of counterconsiderations presented to the student. Recitation presents a model answer to be used by the student as a standard for his or her own writing. Virtual Peer presents alternative answers treated as equal competitors to the student's own answer, enjoying no presumption grounded in the teacher's authority. Empirically, students write more in response to the counterconsiderations of Virtual Peer than they do in response to the model answer of Recitation. The pragmatics of Recitation favor narrow self-assessment ("My answer did not mention conditional probability") while the pragmatics of Virtual Peer favor argument criticism ("This answer looks reasonable at first, but …").

Argumentation protocols of these kinds appear to be effective in both promoting more argumentation and in leading students to think more critically about their own reasoning. Since POLIS captures student responses pervasively, it is possible to review the arguments students make at the beginning and end of an argumentation sequence and to note the quality of argumentation offered. Although in any given online debate, relatively few students change their positions, many show progression toward more critical examination of evidence. For example, in one application of the Adversary protocol, students were asked to

use statistical summaries of their classmates' codings of a presidential address to decide whether the speech was or was not 'liberal.' Initial responses tended to treat the statistical material uncritically: some students argued that the speech was liberal because over half of its paragraphs contained liberal themes, while others argued that the speech was not liberal because the split between liberal paragraphs and neutral/conservative paragraphs was too even. However, after being presented with arguments that challenged the validity and interpretability of the coding, many students wrote position statements that dealt explicitly with the quality of evidence and offered independent grounds for an overall judgment of the speech. At the low end of sophistication, these responses simply exhibited awareness that seemingly scientific evidence might or might not be trustworthy, as in these unedited examples:

1. the speech is liberal. however, if there is confussion in the coding of the document then the results are not reliable. if there is no confussion then the results are correct and the majority of the speech is liberal.

2. I changed my mined because of the last argument concerning the point that there are no reliable grounds because of the statistics about the coding of everyone's opinions. It is too hard to determine what type of speech it reflected because the results were all so different. At the high end, students were able to transcend the original terms of the problem and challenge the relevance of the evidence given, as in the following excerpt from a student answer:

3. This speech cannot be deemed liberal, as it has the presence of strong conservative assertions as well as weak, or rather, mild liberal statements. While one many deem this liberal using only the micro and statistical view, I believe strongly that one must take the text as a whole into account. The overall essence of teh text is …

Only with accumulation of more data for other uses of these advanced protocols will we be able to thoroughly analyze their impacts on learner outcomes, but the promise in both protocols is clear. Our limited experience to date shows that it is possible to create challenging online dialogues with the capacity to engage students in higher-order reasoning, especially self-criticism and critical evaluation of evidence and reasoning for a position.

5. Conclusion

Individuals vary greatly in their tendency to examine what is said and in their willingness to call out potential arguable threads. This tendency is variously

described in terms of “critical thinking ability,” “need for cognition,” or plain “argumentativeness.” At least the first of these is often considered an important intellectual skill, something to be cultivated through education. Important in and of itself, critical thinking is also the means by which students come to deep understandings of any subject.

However, critical thinking needs cultivation in argumentative practice. It might be better to say that critical thinking is itself a form of argumentative practice. Encountering disagreement and interacting with an informed antagonist is the surest way to trigger “central processing.” For this reason, it is worthwhile to build designs that inject disconfirmation, contradiction, and confrontation into teaching and learning dialogues and that do this in a fashion that limits the interpersonal consequences of disagreeing.

In experience to date with online argumentation protocols, we have found it useful to differentiate designs in terms of their capacity to expand around disagreement and in terms of the distribution of authority they presume. While computer technology is in no way essential to the incorporation of argumentation into teaching and learning, it does provide very convenient means for managing these important design features. In particular, it solves in a very generic way many of the dilemmas associated with the interpersonal complexity of argumentation.

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