From Dialogic to Argument-Based Teaching: Introducing Pragmatic Criteria to Analyse Whole-Class Interactions

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Argument-based teaching, broadly defined as the use of argumentation as part of the teacher's everyday pedagogical toolkit, implies dialogic teaching, meaning a shift in teacher's attitude from being authoritative to being more open to student's talk and agency. Nonetheless, the limits between allowing students to talk and enabling them to think argumentatively are still not well-defined. This empirical work addresses that gap through looking at an extended corpus of teacher-mediated whole-class interactions.

KEYWORDS: argument-based teaching, whole-class interaction, dialogic teaching, corpus, classroom discourse

1. INTRODUCTION

Argument-based teaching is generally defined as teaching that implies argumentation as a central pedagogical practice. Argumentation is defined as "a set of complex activities that people engage in together for the sake of making decisions, solving problems, and generally managing disagreements" (Wenzel, 1990; p. 15). It embraces at least three complementary perspectives: (a) the rhetorical, focusing on the natural language efforts of participants to persuade each other; (b) the dialectical, focusing on cooperative methods for decision-making; and (c) the logical, focusing on identifying and establishing standards of soundness of the produced arguments (Wenzel, 1990). When applied in the classroom, argument-based teaching may take several forms, such as: argument-oriented discussions in small groups (with no or little

teacher orientation), argument-oriented whole-class discussions facilitated by the teacher, and more or less structured one-to-one debates. The present paper focuses on whole-class discussions within different disciplinary fields in the middle grades.

In this kind of teacher dialogues with students, the tradition of so-called dialogic teaching, a broader and older term than argument-based teaching, is long and it goes back to the 1970s. It is within this tradition that the more recent term argument-based teaching was born to refer explicitly to the use of argumentation as part of the teacher's everyday pedagogical toolkit. Argument-based teaching implies the adoption of a dialogical stance, meaning a shift in the teacher's attitude from being authoritative to being more open to student's talk and agency. Nonetheless, the limits between allowing students to talk and enabling them to think argumentatively are still not well-defined. A possible reason behind this problem lies in the analytical tools applied so far in the study of teacher-student interactions, which tend to be ultimately descriptive and binary (authentic vs non-authentic, exploratory vs non-exploratory, dialogic vs non-dialogic). There is a lack of pragmatic criteria at the time of deciding which dialogue sequence is of higher quality (more authentic, exploratory, productive) than another.

The exploratory empirical study here presented proposes a method of classifying dialogue moves and sequences using criteria from argumentation theory, with the goal of identifying a hierarchy in terms of dialogue productivity in whole-class classroom discourse.

2. BACKGROUND

Dialogic teaching has been proposed as an alternative to authoritative teaching and it mainly refers to an attitude teachers must adopt in order to allow for more authentic dialogue to take place in the classroom. Following, is a brief explanation of how authoritative and authentic dialogic teaching are referred to in the literature.

Authoritative teaching is usually described as teaching that mainly, if not exclusively, uses an interaction pattern consisting of one or more adjacency pairs of the structure Initiation-Response-Evaluation, also known as IRE, or IRF (Initiation-Reply-Feedback) (Mehan, 1979; Sinclair & Coulthard, 1975). This means that the teacher initiates a query, one or more students reply to it, and the teacher gives a short evaluation or feedback using his/her authority. The structure of this triadic pattern of interaction is shown in Figure 1.

Figure 1 – The IRE pattern structure (Mehan, 1979).

By "authentic", authors usually mean the replacement of the typical IRE/IRF teacher-guided discourse pattern by other, more interactive ways of engaging with the students. Teachers gradually became more aware that instead of assessing students' answers (recitations) they could do "other things" as well, such as: re-voicing, mirroring, expanding, or clarifying (Wells, 1993). Even when the prevailing discourse structure has the form of triadic dialogue, classrooms can be places in which knowledge is dialogically co-constructed (Wells & Arauz, 2006). The idea of "dialogic teaching" was established: the more teachers open up the "dialogue space" for students to interact with them and with each other, the better the learning and dialogic quality of the class (Alexander, 2008; Vrikki, et al., 2018).

Broadly speaking, dialogic education research focuses on five characteristics of verbal interaction in the classroom: (a) teacher initiation moves should include open questions, rather than only closed questions; (b) participants should make extended contributions elaborating previous contributions made by themselves and others; (c) differences of opinion should be acknowledged, probed and critiqued, ideally bringing in the reasons on which opinions are based; (d) integrated lines of inquiry should be pursued through explicit links between contributions and attempts to co-ordinate; and (e) a meta-cognitive perspective of interaction should be adopted by the participants (Howe et al., 2019).

Within this body of research, some studies focus on the description of different discourse moves that teachers and students make during their interactions (e.g. Henessy et al., 2016; Vrikki et al., 2018). However, the description of dialogue moves remains at a conversational (rhetoric) level without any pragmatic (dialectical) criteria for judging their dialogic quality. Other studies focus on generally describing the quality of talk in different dialogic situations, varying between three main qualities, namely disputational, cumulative, and exploratory. Of these, the latter is considered the most productive for educational dialogue (Mercer, 1995; Mercer, Wegerif & Dawes, 1999), as it is the only one that combines both construction and critique

(Ford, 2008). However, the description of types of talk leaves out the micro-level of identifying which types of exploratory sequences are most dialogic, and why.

Argumentation dialogue taking place between teacher and students in the classroom is a type of pedagogical dialogue that is critically oriented (Rapanta, 2019a). This view differs from the traditional view of pedagogical dialogue as a dialogue in which "someone who knows the truth instructs someone who is in error" (Skidmore, 2006; p. 293), to a dialogue in which the initial situation is that of a critical inquiry and construction of knowledge, and the goal of participants is to co-construct the intention and contents of the dialogue, which are embedded in the use of evidence-based discourse. The more these criteria are applied, the more dialogicity is increased, in the sense of transforming the IRF structure into an authentic instructional discussion (Wells & Arauz, 2006). This idea (explained further in Rapanta, 2019a) consists of a top-down approach to defining argumentation as a type of dialogue that is critically oriented and therefore pedagogically more authentic. This paper takes a different approach, as it tackles a different problem. The problem here is not to define the nature of argumentation as a pedagogical dialogue type, but to identify what pedagogical dialogic practices, manifested in sequences of teacher-guided whole-class dialogue, are more argument-oriented than others.

3. METHODOLOGY

The goal of this study is to distinguish between more and less argument-oriented teacher-student dialogue in whole-class discussions. To do this, we will propose pragmatic criteria for deciding on types of moves that open the space for (constructive) argumentation. We will then see how these moves link together to form different types of sequences of different levels from a dialogical argumentation point of view.

3.1 Corpus description

The data for this study were collected during a one-year exploratory project which took place in two public schools in Lisbon, Portugal. The goal of the project was to support middle-grade teachers from different disciplinary areas in their gradual implementation of argumentation strategies in their everyday teaching practice (see also Rapanta, 2019b).

Two science, three history, and one citizenship education middle-grade teachers were accompanied in their classrooms for a six-month period, during which they were trained on how to "transform" from non-dialogic to dialogic teaching, and from dialogic to argument-

based teaching. Thirty-nine (39) lessons of 45 minutes each, distributed among the six teachers' 9th grade classes (average age of students 13.8 years old) were observed using the non-participant observation method and audio-recorded. All classes were then fully transcribed in their original language (Portuguese) by native language transcribers. The final corpus consisted of 9144 discourse moves emerging in 680 sequences, following the segmentation rules described below.

3.2 Segmentation

Both the criteria of segmentation and analysis of our corpus are pragmatic, in the sense that they imply rules of communicative structure and context, and the inter-relations between the two.

In particular, in terms of dialogue structure, we build our proposal of dialogue moves onto the prototypical structure of IRE/IRF, distinguishing into Initiation, Response/Feedback and Other moves. In addition, we consider IRE/IRF as the minimum dialogue sequence to be identified, leaving out incomplete sequences (e.g. single adjacency pairs) or monological discourse (including "monological interactions", see Scott, Mortimer & Aguiar, 2006).

In terms of dialogue context, we characterise Initiation moves as those expressing a specific dialogue goal proposed by any of the participants. These goals/moves are: Information-seeking, Inquiry, and Discovery (i.e. three of the four argumentation dialogue goals initially proposed by Walton, 1998, 2010 and recently discussed in Rapanta, 2018 as the most relevant when studying teacher-student dialogues). Persuasion was not expressed at a move level because, it refers to a final state rather than a process of interaction.

For a new dialogue sequence to be identified, at least one primary initiation move is necessary. The same sequence may contain more, secondary initiation moves without starting a new sequence, as long as speakers' shared communication goal is identified as being the same (i.e. the one marked by the primary initiation move). In the contrary; a new sequence is marked when participants' shared communication goal changes (even if such 'sharedness' is limited to one triadic exchange of the form IRE/IRF).

3.3 Coding scheme

The following types of moves formed part of our coding scheme as presented in Table 1. All moves may be performed equally by the teacher or by the students.

Table 1. Types of moves proposed in the coding scheme.

Initiation	**Response & Feedback**	**Other**
Information-seeking open (IS.o) Information-seeking closed (IS.c) Inquiry closed (IN.c) Discovery (DS)	Elaborate own previous initiation/response (El.own.I/El.own.R) Elaborate other's previous initiation/response (EL.other.I/El.other.R) Accept (AC) Discard (DC) Invite (IV)	Discourse regulation (DR) Task management (TM) Meta-dialogue/Meta-discourse (MD) Off-task (OT)

The decision for "closed" versus "open" versions of Information-seeking (IS) and Inquiry (IN) initiation moves lies in the speaker's intention of: (a) guiding the interlocutor in his/her search for a response; (b) limiting or not the space of interpretation to given information; and (c) eliciting a fact, an interpretation of facts, or a viewpoint about a phenomenon or aspect(s) of it. For instance, the "closed" version of IS is about recalling previous knowledge without a further elaboration of it, whereas the "open" version of IS is about using previous knowledge to come up with a first-level inference. Similarly, the "closed" version of IN is about guiding the interlocutor in a particular search for information to interpret a variable or relation between variables, whereas the "open" version of IN is about opening the space of inquiry towards several interpretations of a given variable or set of variables. Finally, the Discovery move is about coming up with a new variable or relation between variables (e.g., a phenomenon mentioned in the textbook is related to real life contexts). Table 2 shows an example of teacher-generated and student-generated initiation moves for each one of the five types.

Table 2. Examples of initiation moves.

Initiation move type	Teacher example	Student example
Information-seeking closed (IS.c)	In which year did Portugal enter the European Union?	Is water a simple or a double covalent bonding?
Information-seeking open (IN.o)	Look at the first graph: Why is not Portugal appearing among the EU countries?	What do the letters of our alphabet represent?

Inquiry closed (IN.c)	(comparing two paintings) Do you think the figures on the right are similar to the figures on the left?	Isn't it enough to just draw a diagonal line between 'a' and 'b'?
Inquiry open (IN.o)	(projecting a slide) Why does Hitler's image appear next to Versailles' Treaty?	What did the Brazilians think in relation to the Portuguese colonizers?
Discovery (DS)	Do we nowadays have *direct* or *indirect* economy?	Did White slaves exist?

The inter-rater reliability among the two authors was calculated on a randomly selected 20% of the corpus, and it was acceptable (Cohen's K = 0.809). Figure 2 shows a coded excerpt of the corpus.

1	T	Look at the two images I projected on the board. There is the Treaty of Versailles and then I put that other one over there (Slide 2 has a photo of Hitler and of the atomic bombs). Can you say why?	IN.c
2	T	Is there any relationship between the Treaty of Versailles and that personality there?	EL.own.I
3	T	Vasco	DR
4	S	Yes because it was the Treaty of Versailles..	CO
5	T	It was the Treaty of Versailles that…	DR
6	S	That was Hitler's propaganda	El.own.R
7	T	Why was it Hitler's propaganda?	IV
8	T	What was the feeling that was predominating and enabled him to use the Treaty as his propaganda, was it because it had some kind of effect for the German population?	IN.c
9	S	Because it was humiliating and considered very unfair.	CO
10	T	Right, exactly.	AC

Figure 2 – A coded except of the corpus.

Figure 2 represents a sequence in which the main initiation move is a closed Inquiry (IN.c) proposed by the teacher (T) in Line 1. The teacher participates with three more requests, related to this primary move: an elaboration of the initiation move (line 2), an invitation for the student to reflect further on her first answer (line 7), and another closed Inquiry move (line 8), which builds on the previous moves without initiating a new sequence (intention-wise, or topic-wise). The student participates with two contributions (lines 4 and 9) and one elaboration of her own response (line 6).

4. RESULTS

The following four types of sequences emerged from the analysis:

(a) Low(er) dialogical IS sequence: a series of known information questions replied to by one person at a time, followed by no or brief elaboration. An example of this type of sequence, which can be called simply "knowledge check," is presented on Table 3.

(b) High(er) dialogical IS sequence: multiple answers by different students on the same known information question. An example of this type of sequence, which resembles a "cumulative exploration", appears on Table 4.

(c) Low dialogical IN sequence: Several viewpoints are invited on the same issue or several issues are interlinked on the same viewpoint, constructing an interpretation of the phenomenon/variable at hand without critically confronting ideas. An example of this type of sequence, which we call "constructive exploration," is presented on Table 5.

(d) High dialogical IN sequence: Several viewpoints are interlinked on the same issue dialectically, i.e. through confronting and/or challenging ideas without necessarily arriving at consensus. An example of this type of sequence, which we call "joint or critical exploration," is presented on Table 6. Figure 3 presents the continuum between low and high dialogicity manifested by each of the identified types argument-based teaching sequences.

Figure 3 – The four types of emerged argument-based teaching sequences.

Table 3. An example of a "knowledge check" argument-based teaching dialogue (in bold, the types of moves that mark this characterization; here, they are closed information-seeking moves).

1	T	We had seen the arrival in India. We finished the arrival in Calcutta. Did we read everything? Ok, now let's summarize (.). How did the preparation of the overseas trip to India take place? The first trip, **who was the leader**?
2	All	Ahh, Cristopher Colombus.
3	T	King João II, isn't it? Pay attention, who was the one who started to prepare everything beforehand, **first he took care of what**?
4	S1	[inaudible] in the Atlantic

5	T	In the Atlantic, no; in the Atlantic he knew how things were, didn't he? (.) It was in the Indian ocean, wasn't it? He even sent the missionaries knowing that, didn't he? **What were their names**? (.)Pero de Covilhã and Afonso de Paiva, isn't it?
6	T	In addition, **he even explored which coast?**
7	S2	The African.
8	T	The occidental African coast. Through some important navigators, **through whom?**
9	S3	Diogo Cão.
10	T	**What did Diogo Cão explore?**
11	S4	The coast.
12	T	**The coast of what part of Africa?**
13	S1	Of Angola.
14	T	Of Angola and Namibia, isn't it?

Table 4. An example of a "cumulative exploration" argument-based teaching dialogue (in bold, the types of moves that mark this characterization; here, they are open information-seeking moves).

1	T	**There are more health indicators which we haven't mentioned yet. Such as?**
2	S1	Mental health?
3	T	We already mentioned that. There are other indicators as well..
4	S2	Respiratory diseases?
5	T	Haven't we talked about that? Luis, we already talked about the mortality rate, and we said that it may be caused by Cardiovascular diseases, respiratory diseases... **I want you to say something different. Today I said something about...**
7	S4	Diets.
8	T	We already talked about food, that it must be balanced and varied. Another indicator which also says that our society, in particular the Portuguese, is not in great health.
9	S5	Child mortality.
10	T	We talked about that. **Things we haven't said yet.** Have we talked about all mortalities. Iris?
11	S6	Prevention and control of infection and resistance against the... Something..
12	T	Say, say it.
13	S5	Infected hospital beds.
14	T	**Beds? Are the beds infected?**

Table 5. An example of a "constructive exploration" argument-based teaching dialogue (in bold, the types of moves that mark this characterization; here, they are closed inquiry moves).

1	Maria	Respect the space where we live (students brainstorm about values related to the concept of "home").
2	Teacher	Respect the space where we live. **Who agrees with this rule by Maria, does everyone agree? Or no one?**
3	Paul	Yes.
4	Teacher	This "yes" is nice! Why do you agree?
5	Paul	(.)
6	Peter	Because it is a nice rule.
7	Teacher	Because it is a nice rule… Say, Luke. What would you like to say in regard to this rule by Maria, what do you think?
8	Luke	I think it is correct. Because I hate it when my brothers come into my room and start to mess it up.
9	Teacher	Your brothers start doing what?
10	Luke	To disorganize it.
11	Teacher	To disorganize your space. So, respect the space of everyone. What do you all think? Respect the space of everyone. Ok… **Do you all agree? Respect the space of everyone…**
12	George	I don't know. I just have a room all by myself.
13	John	I don't.
14	Michael	Oh, I do.
15	Teacher	So, when you don't have a room just for yourself…
16	Michael	We should respect the space of the others… Respect the other inhabitants (students laugh).
17	Luke	Respect the other residents.

Table 6. An example of a "critical exploration" argument-based teaching dialogue (in bold, the types of moves that mark this characterization; here, they are open inquiry moves).

1	Andrew	Ok, the point is about the spaces … in closed spaces there is more transmission of bacteria and viruses between people … so, everyone gets sick if someone gets sick. In the exterior, there are also bacteria and viruses, this is why we can also get sick. But… there is more oxygen than an interior space, because the air… is always the same, and when we inhale and exhale, it is … there is more carbon dioxide getting out … and therefore the concentration of carbon dioxide in the space starts to increase and that of oxygen to decrease…

2	Laura	One of the problems of doing sports in the open air is solar exposition … we have to carry … if we are not protected, it can affect our skin, even when the sun is not … even when it is cloudy … [inaudible] (she goes on her reasoning mentioning also vitamin D)
3	Teacher	And **how is it that vitamin D relates to that**? Explain!
4	Laura	When … if we are doing sports in the open air … but being protected … we can collect the sun's energy but not the vitamin D…
5	Teacher	When we wear sun protection, do we absorb vitamin D?
6	choir	Yes!
7	Teacher	Do you agree with her?
8	choir	Noooo!
9	Teacher	**So, how is it?**
10	Laura	…I may be mistaken, but when the vitamin D, it only gets absorbed, if we have…if we don't wear sun protection …
11	Teacher	It is not about being protected or not protected. It is … when… when the sun… it projects on our skin, isn't it? There is a substance, let's say, in our skin, called pro-vitamin D and the sun helps this substance to be transformed into vitamin D … and so, go on with your reasoning… **how is it now?**
12	choir	[inaudibe] (students talk simultaneously)
13	Andrew	We can be outdoors during the hours that it is not as hot … that is … we cannot be at the sun between 10 in the morning and 4 in the afternoon.

What about persuasion? A persuasion sequence can be defined as engaging in peer-to-peer confrontation exploring one or more aspects of a phenomenon trying to reach a compromise or a consensus through the negotiation of meaning and concepts. This type of authentic argumentation was not present in the corpus, possibly because it only contained teacher-guided whole-class discussions, and not peer-to-peer interactions. Persuasion sequences were only present in a group presentation format, following small-group discussions, in which a group representative presents their arguments/conclusions to the other groups, as a kind of sharing conclusions. Confrontation may take place, but it is not spontaneous.

5. CONCLUSION

A pragmatic-argumentative analysis approach was necessary to lead to the distinction of different qualities of what is generally defined as "exploratory talk" (Mercer et al, 1999). By introducing pragmatic criteria inspired by Doug Walton's Argumentation Dialogue Theory we

were able not only to identify dialogic qualities of different moves, but also to distinguish between different manifestations of the same types of sequence. In particular, two types of Information-seeking dialogue sequences were identified: one of low dialogicity, based on closed Information-seeking moves, and one of high dialogicity, based on open Information-seeking moves. Similarly, two types of Inquiry dialogue sequences were identified: one of low dialogicity, based on closed Inquiry moves, and one of high dialogicity, based on open Inquiry moves. In whole-class discussions, authentic persuasion dialogue sequences were not present. These findings may have a double reading. On one hand, they confirm Reznitskaya's and colleagues' (Reznitskaya & Gregory, 2013; Reznitskaya & Wilkinson, 2017) intuition to exclusively focus on inquiry dialogue, as the most appropriate type of dialogue to take place in the classroom. On the other hand, they stress the importance of peer-to-peer discussions and small-group interactions for persuasive argumentation to take place.

Future work will consist in the quantitative analysis of the inter-relations between moves and sequences in order to identify micro-patterns of productive pedagogical dialogue, as well as distinguishing between teacher-initiated and student-initiated sequences.

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