Analysing Video Recordings of Classroom Lessons Using the Scheme for Educational Dialogue Analysis (SEDA)
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Student Guide

Introduction

This dataset offers a tool and guidelines for systematically analysing ‘dialogue’ in classrooms across a wide range of educational settings. A team of researchers from the University of Cambridge, UK and UNAM (National Autonomous University), Mexico has developed a coding scheme that distils out - from key literature in the field - and embeds the common qualities of educational dialogue that are considered productive for learning. These qualities focus on exploring difference in perspectives (e.g. Bakhtin, 1981). They include teachers and students tuning in to others’ perspectives, making reasoning explicit, and building knowledge together through sharing, critiquing and coordinating contrasting ideas. The openly licensed Cam-UNAM Scheme for Educational Dialogue Analysis (SEDA) contains 33 categories for analysing contributions to dialogue in depth. The dataset is provided by Dr Sara Hennessy from the University of Cambridge and illustrates how the framework can be applied using video recordings and transcripts. It highlights some issues arising - including reliability (consistency between different coders’ judgements) and moving beyond turn-by-turn coding to interpret whole dialogic sequences. It offers practical pointers for those wanting to use or adapt the scheme to address research questions around how ‘dialogic’ interaction in a particular setting seems to be, i.e. how much dialogue is of the productive kind described above. The dataset will be of most interest to those using video or audio recordings in their research and wanting to analyse ‘natural’ dialogue.

Analysing Classroom Dialogue and Introducing SEDA

There is some evidence from international studies that dialogic interactions between students and teachers and between peers in the classroom promote learning gains. These include both gains in subject knowledge, as well as generic skills like critical thinking and reasoning. However, dialogic interactions are not commonly observed in classrooms and shifting practice to include more dialogue can be slow. How can we recognise productive dialogue when we see it (and ultimately, foster more of it)? Dialogic interactions involve far more than just ‘talk’; they include teachers and students taking account of others’ perspectives and evaluating differing ideas, making their reasoning explicit, and working together to construct new knowledge.

Various methodologies and methods are available for identifying and analysing classroom dialogue. These include the two main traditions of linguistic ethnography and sociocultural research, which have been outlined by Mercer (2010). The team reviewed the methodologies of the main literature in the field, focusing specifically on ‘dialogue’; much of the work we draw on stems from the sociocultural tradition, beginning with Vygotsky (1978), who emphasises that language is a cultural and psychological tool which can develop reasoning. In recent years, researchers have used video recordings to identify speakers more easily and capture dialogue more accurately, benefiting from seeing who is speaking, from nonverbal cues including gaze, and from gesture and interactions with artefacts.

The kind of analytic tools they use varies. While some researchers take a systematic coding/checklist approach, with tight definitions for each category (e.g. Michaels & O’Connor, 2011; Wells, 1999), others prefer to offer looser exemplars or indicators for dialogue; for example, types of productive questions (e.g. Nystrand, Wu, Gamoran, Zeiser, & Long, 2003) or reasoning words like ‘because’ (Mercer, Dawes, Wegerif, & Sams, 2004). Our team drew on the key concepts in both kinds of account but ultimately produced a tool for systematic turn-by-turn analysis. SEDA identifies Communicative Acts.
(Hymes, 1972) or CA (not to be confused with the same acronym also commonly used for conversation analysis); these acts are identified by their function within an interaction, for example ‘elaborate a previous response’. Working at this micro-level is particularly illuminating since it allows the researcher to carry out fine-grained, systematic analyses of what participants actually do and say in practice during dialogic interactions. However, clustering the codes increases reliability and practicability, additionally allowing researchers to count frequencies. SEDA has 33 codes clustered into 8 groups. Figure 1 shows the clusters.

**Figure 1. SEDA clusters.**

Data Exemplar: Analysing Video Recording Using SEDA

It is argued that researchers lack a framework for analysing dialogue that is widely applicable to diverse educational contexts, covering both teachers and students, consistent with the main theoretical perspectives and employing a single set of descriptors to capture all the functions in dialogue. SEDA (pronounced ‘sedda’ as in Spanish) is the result of a 3-year British Academy-funded collaboration between two large teams in the United Kingdom and Mexico ([http://tinyurl.com/BAdialogue](http://tinyurl.com/BAdialogue)) led by Dr Sara Hennessy and Prof Sylvia Rojas-Drummond whose – rather ambitious – aim was to fill this gap.

The data provided come from one lesson of three delivered by a very experienced secondary history teacher, Lloyd, who taught a class of boys aged 12–13. Together they explored the open-ended question: ‘Can we imagine the experience of trench warfare?’ Here, in Lesson 3, we see a 6-minute excerpt from a rich, whole-class dialogue that drew on learners’ experiences of digital resources they had previously encountered. The dialogue in the exemplar synthesises students’ evolving views about how far historians can extrapolate from using such sources and from partial experience, and how convergent their thinking can realistically be.
VIDEO: You can see a video clip of this excerpt here:

Transcript

00:05 When I was planning this lesson, I thought about a trench as a place of--it's kind of what you've just said, really. People will be working in them, resting in them, playing in them. Work, rest-- that's what you do, I suppose, in your life. And you've articulated some of those there. What do people think about that?

00:27 Are you happy with that, Dylan, as a way of describing how you might talk about the experience of trench warfare, and whether or not it's actually possible to do it? Have you got some other points? How did you organize it? We were thinking that we don't actually know if that's true. [INAUDIBLE] Because we won't actually know. Some of that might be true, but we can't be sure.

00:49 All right, so now we're getting into questions about the reliability of the evidence as well. All right, very good. Marcel, what did you say? So what Felix and Dylan have done, is they've sectioned out what we could say, what things we could write about here rather well. I think they're good. What was the point that you just made to me we were discussing?

01:09 Well, I think [INAUDIBLE] OK, so here's the point here. Can we really imagine what that would have been like?

01:30 Is it really possible for us to do it? Jonathan, any thoughts on that? [INAUDIBLE] What do you think, Felix, about that? As you've sectioned that out there, Marcel's actually challenging the notion that it's actually possible to imagine it. What do you think? Yeah. Well, it probably is [INAUDIBLE] there's so much information about it. It says like, [INAUDIBLE] propaganda, and then there's how it actually happened. OK, good. [INAUDIBLE] quite a lot of sources. And back then, [INAUDIBLE] not quite a lot of people were there. Very good. Robert's going to make a point in a minute, which I'm going to ask him. Ricky, what do you think, actually imagining that?

02:12 I don't think you could imagine being [INAUDIBLE] So is it one of those things that it's just too hard for us to imagine? It's like, when you imagine winning the lottery, you can imagine what it would be like. [INAUDIBLE] very good. I think that's quite a nice analogy. I mean, it's they're different, but it's almost beyond our experience. Alex?

02:32 I think there are probably bits we can imagine, and bits we can't imagine. [INAUDIBLE] Might be able to imagine certain bits of it. All right. Robert, can I take the point that you made? It links in with what Alex said. Listen to this-- this is Robert's view. You can imagine what it would look like, but you can't imagine what it would feel like, like how you would be feeling.

02:53 OK, what do you think about that, Owen? Can you imagine what it would look like, but not actually what it would feel like? It's quite like that. Yeah, because on DVDs and the films and the poems, it explains-- and you can see what it looks like. So [INAUDIBLE] and you're both in trenches.

03:15 But you wouldn't know what it's like to go ages without food and water. OK. Can I suggest-- go on, Ricky? Well, that's partially true, but you wouldn't know what it'd like to be shot by a bulletor to be bombed, or something like that. You wouldn't see what it'd look like, either. Yeah. Owen's nodding his head there in agreement. What you're saying is true, isn't it? I like this notion about, it's something completely outside of our experience, can we really imagine it. Well, I tell you what, then. Why not add in-- let me try, or somebody else help me out here-- is it possible for us to imagine? Well, yes, what it looked like. I like that, Robert. It wasn't what I thought-- I thought I was going to write something else on here.

03:38 Yes, what it looked like, not what it felt like. You were then able to bring in all the thingsthat Felix and the [INAUDIBLE] or whoever it was who came up with this idea. So yeah, there are some things we can describe about it, but the actual feelings are rather difficult.

03:58 Any other points to make here? Felix? Well, about the feelings. Every single person's experience would've...
been different. Can't we say that everybody has got different feelingstowards the war? Ricky, would you agree with that in view of what you said? I suppose, different people would react in different ways to winning the lottery, or would imagine winning the lottery in different ways.

04:39 Felix? Yes, you can't really say-- we wouldn't know what anybody would've felt like even if they would know [INAUDIBLE] felt like. You know what [INAUDIBLE]. Can we ever achieve a common understanding of anything? There you are. Interesting discussions that we've had of this project so far. Very good. Henry? I was thinking that we could imagine it on a factual level,

05:03 ... but no on a personal level. Factual, not personal. Marcel, are you happy with this conversation? Because it was you-- you brought that up. Are these points you would agree with? Yeah. Yeah, certainly. OK, Chris? But then you wouldn't think of it if it happened to you. You wouldn't-- think of it, and feel it, if it did happen to you. It's like, if you won the lottery, you wouldn't come back [INAUDIBLE]

05:27 OK, so your thinking's been changed. It's almost too hard for us to imagine. Some stuff, if it comes down to it, you wouldn't do what you said you would do. OK, I see that point.

ANALYTIC SCHEME: A condensed version of SEDA is available at http://tinyurl.com/SEDAcondensed, the cluster descriptors are at http://tinyurl.com/SEDAclusters and the detailed coding scheme is at http://tinyurl.com/SEDAfull. The scheme is openly available under a CC-By-4.0 licence (international): http://creativecommons.org/licenses/by/4.0/. It can be freely used or adapted by other researchers or teachers.

Analysis: Using SEDA in Practice

SEDA can be used for many different research purposes, and applied to diverse educational settings: any age phases, subject areas, activities with and without digital technology use, and contexts including whole-class, group and paired work.

In this section Sara talks you through the practicalities of how you could apply it to a lesson recording, using the exemplar provided.

First, what are we looking for exactly?

The work of key theorists such as Alexander (2008) and Mercer and Littleton (2007) illustrates how in the dialogic classroom teachers and students will be cumulatively building on each other’s ideas; taking extended turns; posing open questions, speculating and predicting during joint problem solving and inquiry; reasoning explicitly and justifying their viewpoints; challenging, comparing, coordinating and evaluating diverse ideas. These features of dialogue underpin SEDA, along with some scaffolding and metacognitive elements of learning, and some acts involving connection to contexts outside the current dialogue. We are looking to see whether these features can be identified in an episode (or even across lessons). So, how do we go about applying SEDA?

Step 1: Transcribing

First, you need to prepare the transcript, using a conventional notation system to show pauses, overlapping speech, unclear speech, nonverbal activity, etc. My team uses selected elements from a commonly used system devised for this purpose by Jefferson (2004). Use participant names if you know them; this greatly helps to see who is building on whose contributions. We would segment the transcript where appropriate. A CA is defined by the minimum number of utterances or actions needed to reflect its function; if necessary, we break down a turn comprising several sentences, or even a single sentence, into smaller units, if they seem to have different functions within the dialogue. We allocate each one a line in the coding spreadsheet. Then we can apply two or more codes in sequence within a turn (you might decide to prioritise certain codes and apply only one). Note that segmentation is not always straightforward and you will need to make your own decision about how to do it. In six turns in the data excerpt (lines 119–120, 122–123, 125–126, 128–130, 132–133, 149–150), you’ll see that longer utterances by the teacher that have more than one distinct function are split into two or more numbered lines to clarify where codes are applied. Thus, there are 41 turns but 48 lines. The richer the dialogue...
(especially with older students), the longer the turns, so the more need for segmentation.

**Step 2: Coding**

My exemplar is coded at the level of CA, and that offers lots of rich detail about the interaction, but you might choose to maximise reliability by coding at the more macro cluster level. Ideally, we’d watch the video all the way through to get a feel for the episode. Then we run it through again, applying codes from the scheme to the transcript, pausing and rewinding the tape often to reflect on what we’ve seen and to be sure we’ve captured it accurately. You could use a qualitative data analysis package such as NVivo for coding if you wanted. In fact, some people code video directly without even preparing a transcript – but this will be difficult in some contexts, especially if actions and speech are fast and if background noise makes hearing the audio tricky. In that case you would have to rewind multiple times, which compensates for the time you saved in not transcribing!

Be aware of some general coding rules:

Identifying an initiating act (e.g. ask for explanation) does not depend on whether it led to any take-up or response (e.g. whether an explanation was provided) since it is whether the first speaker had a dialogic intention that is paramount.

A single communicative act might have several different purposes so you can assign two or even three codes if necessary, even after segmentation. You can see that in Line 146 we assigned three codes (P6 – State (dis)agreement/position, R1 – Explain or justify another’s contribution and C1 – Refer back). Apply only one code from each cluster to one utterance/action though, so if two or more seem to apply, assign the one with the lowest number, i.e. towards the top of the hierarchy within the cluster (order is broadly related to dialogicality and higher-order thinking).

Decide how strict you want to be in assigning codes. We interpret SEDA definitions very strictly since we are concerned with maximising reliability between coders, but if you’re working alone, you may want to include ambiguous cases, half-finished utterances, etc. In the exemplar, there are two turns (142, 144) with perceived challenges by students that we deemed too implicit to code P5 – Challenge viewpoint. Likewise, one partially inaudible utterance in Line 131 was not coded although it was probably a pertinent contribution (E2) at least. E1 (Invite opinions/beliefs/ideas) and E2 (Make other relevant contribution) are interesting categories – we had a dilemma within the team about whether to even include them in the scheme since clearly they could occur a lot in any lesson and may not distinguish dialogue; however, without them, you get a lot of holes in your excerpt! In the end, we put them in their own cluster that researchers can use if they want to.

Contributions in the E (Express or invite ideas) cluster may introduce new ideas or speakers without any explicit connection to other contributions (versus elaboration and explicit reasoning).

Think about how you would code the common question ‘What do you think?’ when it is posed after several views have been expressed? This could be interpreted either as referring to a recent contribution from another participant or as referring back to the original inquiry question and the person who responds may not perceive the questioner’s intention accurately either. This was initially a source of unreliability within our team; such ambiguous cases are now coded as E1.

So, deciding whether a contribution responds to another’s is challenging! Unless very explicit language is used, it is difficult to say who originated or owns the ideas being shared and formed through an authentic dialogue. Students often ‘think aloud’, expressing comments inarticulately as they formulate their ideas. In the exemplar, you can see this through the slightly clumsy analogy of a lottery win being difficult to imagine (first expressed by Ricky: 140), which is nonetheless picked up by others and refined. The main message is that inference and over-interpretation need to be monitored.

**Step 3: Analysis and interpretation**

Assigning codes is not the end of the story, of course. It is interesting to see what proportion of an episode is coded as dialogic; you may also want to look at what’s happening when dialogue isn’t! Nevertheless, the exemplar shows that a very
large proportion (36/41 or 88%) of turns were qualified with at least one category from the coding scheme, indicating that the interaction here was highly dialogic. You may want to do a frequency count to see which codes and clusters feature most prominently, and thus what kinds of dialogic interactions are taking place. In the exemplar, 20 out of the 33 (55%) available codes were applied, representing 7 of the 8 clusters in the scheme (see Table 1).

You may well also want to know who is making the contributions. In this case, the dialogue is inclusive of multiple voices; over one third of the class (10/27 boys present) participates during this 6-minute lesson segment. We can see that turns are evenly split between teacher and students (20 by the teacher and 21 by the students), which is unusual for whole-class teaching in typical classrooms, where it is estimated that teachers normally speak for at least two thirds of the time and student utterances are much shorter; taking extended turns is a marker of dialogue and we can see some of that in this excerpt, where the mean number of words per student turn is almost 16.

So what kinds of dialogue are happening? We can observe the explicit and high-level reasoning by students, including: explaining (R1: 146; R2: 127, 136), drawing analogies (R2: 140), making distinctions (R2: 121, 140, 144, 155) speculating (R3: 159, 163; R4: 142, 148), posing counter-arguments (R2+P6: 136; R4+P6: 148). Indeed, about half of students’ turns in the transcript (11/21) are assigned one of these three kinds of CA. The reasoning is coupled with explicit relative positioning by students (P6: 136, 146, 148; P5: 159), in response to invitations for evaluation and positioning by Lloyd (I2: 123, 133, 135, 145, 152, 156). In a further 4 turns (127, 134, 138, 155) there is implicit positioning which does not quite qualify for a P code as no explicit references to others’ contributions are made, but the content suggests that the speakers have probably taken account of others’ viewpoints and voiced their own in relation to those. Moreover, participants are highly responsive to others, with 13% (6/47) turns being coded B1 – Building on others’ ideas or clarifying/explaining others’ perspectives (128, 141, 151, 152, 154, 164) and one teacher turn is coded P1 – Synthesise ideas (149). These codes illustrate how the participants are continually evaluating and refining perspectives and moving forward the dialogue rather than stating new, unlinked ideas or merely defending their own positions. In particular, positioning includes partial (dis)agreement by students (e.g. P6: 148), often with justification, demonstrating a high level of responsiveness as another’s idea is considered before articulating which part is agreed with and to what extent.

Table 1. Frequency of CA coded per cluster in exemplar.

<table>
<thead>
<tr>
<th>Cluster</th>
<th>CA</th>
<th>Frequency</th>
<th>Subtotal</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>I1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I2</td>
<td>7</td>
<td></td>
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<tr>
<td></td>
<td>I3</td>
<td>0</td>
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<tr>
<td></td>
<td>I4</td>
<td>1</td>
<td></td>
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<tr>
<td></td>
<td>I5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I6</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>R</td>
<td>R1</td>
<td>1</td>
<td>14</td>
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<tr>
<td></td>
<td>R2</td>
<td>8</td>
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</tr>
<tr>
<td></td>
<td>R3</td>
<td>2</td>
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</tr>
<tr>
<td></td>
<td>R4</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B1</td>
<td>6</td>
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</tr>
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</table>
Of course, just because a turn is coded does not mean it signifies or led to productive dialogue; we need to look at chains of interaction to judge this. So now, we look more qualitatively and holistically at the findings and see what seems to be happening during the sequence. Here, I ‘go beyond the data’ to interpret the patterns of dialogue in light of my knowledge of the field and of other classrooms, and to synthesise the findings with other literature. This interpretation is backed up by close reference to the excerpt itself though. I’d start by suggesting that Lloyd positions himself as a co-learner with his students and engages in open-ended co-inquiry (and I’ve seen this same stance throughout all of his lessons I have observed in the past); for example, at one point in this excerpt he demonstrates his own open-mindedness (149),
modelling for the class how his thinking is being realigned with new ideas encountered. However, there is a great deal of teacher mediation in this lesson; the teacher calls on named individuals in 16/20 of his turns, and students rarely address each other directly. This might be seen in one sense as less dialogic, but we can observe that this is a strategy Lloyd employs; he retains control over the course of the dialogue, continually drawing out, contrasting and synthesising different ideas and perspectives and their nuances – a clear illustration of Alexander’s (2008) ‘purposeful’ teacher behaviour. Nevertheless, students often volunteer to speak (raising hands) before he calls on them, indicating their proactive responses; for example, Alex spontaneously expresses partial agreement with Ricky in Line 142 and Ricky with Owen in Line 148. The evident respectfulness and unusual level of dialogicality indicate that Lloyd’s strategy is productive. Importantly, his language often depersonalises, asking ‘Do you agree with that (idea)?’ rather than ‘Do you agree with Felix’s/Robert’s idea?’ (apparent in all instances of I2, listed above). This technique minimises loss of face or defensiveness.

In sum, Lloyd’s careful orchestration progressively broadens and deepens the dialogue (Wegerif et al., 2010). This is captured at the I (Invite elaboration or reasoning) cluster level (13 codes), especially his invitation to build on and elaborate views via the use of I2 (7 uses). He makes timely interjections to recall specific prior contributions for juxtaposition with other perspectives, inviting commentary and evaluation (I2: 119, 123, 133). This is a reminder that this classroom has a dialogic ethos where the students are commonly used to engaging with each other. There are four instances of reference back (C1 – Refer back) by the teacher, including both to whole-class discussion (156) and pair work (130, 143). Both Lloyd (119) and Owen (146) also explicitly reference the rich range of digital resources encountered earlier that underpins and sustains this cumulative dialogue over its 3-lesson duration (at least). Participants put themselves into others’ shoes and reflect on the experiences, perspectives and feelings of the creators of the artefacts previously analysed and of their subjects (soldiers). Using the digital resources has brought further voices into the dialogue from beyond the current context and era.

Applications of SEDA

All tools have some limitations. SEDA does not presently address the affective dimension of interaction, nor does it actually categorise gesture, gaze and tone. However, it can be used to code nonverbal dialogue, for example reasoning in the context of digital technology use. We are developing a set of specific examples for that context, but the main scheme can be used too. We are also developing versions for peer group dialogue and teacher professional development.

What kinds of research questions can this scheme address? Examples include:

- How equitable is the participation of different learners? (We recently adapted SEDA for teacher use and addressed this very question in the context of primary science learning: Vrikki et al., forthcoming.)
- Which teachers or lessons are more dialogic than others? (To see how a team at Cambridge is investigating the relationship between how dialogic a teacher is and student learning gains by applying an adapted version of SEDA to 240 lesson recordings, see http://www.educ.cam.ac.uk/research/projects/classroomdialogue/.)
- Are certain phases of a lesson or types of activity more dialogic?
- Which particular chains of dialogic interaction are commonly observed (e.g. are invitations for reasoning made and are they taken up?)
- How stable and diverse are patterns of interaction within and across lessons and learning contexts?
- Does interaction become more dialogic over time (for example, in response to a professional development intervention), and if so, how?

Further quantification of CA is also possible and researchers may wish to examine patterns of CA identified or co-occurring. In our own applications, we use time sampling as well as raw frequencies, and we rate lesson episodes using broader descriptors, for example related to student participation and agency. It is up to individual researchers to decide
how to proceed.

Reflective Questions

1. Using what you have learnt from the exemplar, have a go at applying SEDA to the extra data provided – the rest of the same history lesson (or to a transcript of your own). First eyeball the data without looking at the scheme and see what kinds of interactions you think are happening. Then apply SEDA and see what more you learn from this? Are there any surprises? Is there anything you think SEDA didn’t capture?

2. Take a look at the full scheme at http://tinyurl.com/SEDAfull to check whether anything was actually missing or whether you simply hadn’t realised it was part of another category.

3. How ‘dialogic’ does the interaction seem to be? Which parts are more dialogic? How do you know?

4. Which codes would you use to answer a question like ‘To what extent is reasoning visible?’ Do these extend beyond the R cluster? Consult the cluster scheme at http://tinyurl.com/SEDAclusters to ensure you understand what is in each cluster.

5. How might you adapt SEDA for different – or your own – research purposes? For example, would simply using fewer categories work or would you need to recombine them?

6. Try reclustering the scheme. Clustering can be done on the basis of participants’ intentions or socio-linguistic functions. SEDA has a mixture but we have experimented with different kinds of clustering (see Hennessy et al., 2016 for details) and there is no one right way to do this. Go to the CLUSTERING template and rearrange the codes to see if you can achieve a better formulation for your own purposes.

7. Bear in mind that the present clusters were designed to maximise reliability at cluster level; would that be an issue in your version? Does it matter if you are a sole researcher?

Further Reading

Project Resources


References


Mercer, N. (2010). The analysis of classroom talk: Methods and methodologies. British Journal of Educational Psychology, 80, 1–14.


