

# Teachers as "natural experimenters": Using T-SEDA to develop classroom dialogue

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“The true method of knowledge is experiment.” — William Blake (1757-1827)

## 1. Introduction

Teachers have long been encouraged to use and apply research in their professional development, and the ‘teacher as researcher’ notion has gathered momentum over more than four decades. In this chapter we write about a professional development (PD) approach that involves embedding teacher inquiry in day-to-day practice within a context of whole school development. The central focus for teachers is on the investigation and enhancement of classroom dialogue between teachers and pupils. Productive classroom dialogue involves participants in critically and respectfully taking account of others’ perspectives in constructing knowledge together (Kim & Wilkinson, 2019; Mercer, 2000). Teachers are encouraged to create a supportive classroom ethos and opportunities for multiple students to participate in classroom activity and learn together. In the past this dialogic approach has rarely been observed in classrooms, despite increasing evidence of its association with student learning and attitudinal outcomes (Alexander, Hardman & Hardman, 2017; Howe et al., 2019). However there is growing interest in developing dialogic pedagogy among practitioners and educational researchers.

The inquiry at the centre of this chapter took place in one primary school in Eastern England. It was undertaken by a Year 6 teacher (Kate Dowdall) with the support of her professional development leader who took a wider whole-school development perspective (Hannah Owen, Deputy Headteacher). Kate’s inquiry involved the use of an extensive, research-informed professional development resource called ‘T-SEDA’ (the Teacher Scheme for Educational Dialogue Analysis). T-SEDA was developed in the Cambridge Educational Dialogue Research (CEDiR) group of the University of Cambridge Faculty of Education, by a team including the three other authors of this chapter (Sara Hennessy, Ruth Kershner and Elisa Calcagni).

After outlining T-SEDA in the next section, we then look in detail at Kate's T-SEDA inquiry. This took place in guiding reading lessons which she audio-recorded and coded classroom dialogue using T-SEDA, taking a critical and reflective analytical approach to her own role. Her strategies included use of talking points, ground rules, sentence stems, think-pair-share and withholding evaluation, as explained later. These led to students giving lengthy and well-justified opinions about a text, building on others' ideas, challenging and agreeing with each other during rich discussions - all key elements of productive dialogue and learning. Kate's inquiry was one of several dialogue-focused inquiries that took place across the school, facilitated by Hannah in her role as deputy head. During the previous year Hannah had aimed to develop more dialogic approaches in all year groups and she had taken steps to engage teachers in using inquiry for their own professional development. So the T-SEDA project fitted well with what Hannah already had in mind for school development. In the final section of this chapter, we draw on a discussion that took place after Kate's inquiry had finished with a view to writing this chapter collaboratively. This dialogue allowed us to share our different perspectives on how the use of T-SEDA worked in this school context and the general issues it raises about linking research and practice. In our conclusion we reflect on the role of T-SEDA in potentially supporting the development of an 'inquiry stance' by teachers that lies at the core of effective professional learning, valuing teachers as 'natural experimenters' in practice.

## **2. The Teacher Scheme for Educational Dialogue Analysis (T-SEDA)**

The Teacher Scheme for Educational Dialogue Analysis (T-SEDA) focuses on key features of classroom dialogue, highlighting those that are known to be productive for learning and sharing them in accessible format. It is intended to provide a highly flexible, research-informed tool for teachers and teacher educators to actively engage with, and lead, professional development that is driven by teachers' reflective inquiries into their own practice. The main T-SEDA resource pack includes a self-audit, a dialogue coding framework, inquiry planning templates, systematic live observation tools, case studies and video exemplars; it is freely downloadable from a website at <http://bit.ly/T-SEDA>, along with editable templates. The three tools at the heart of the T-SEDA pack are depicted in Figure 8.1.

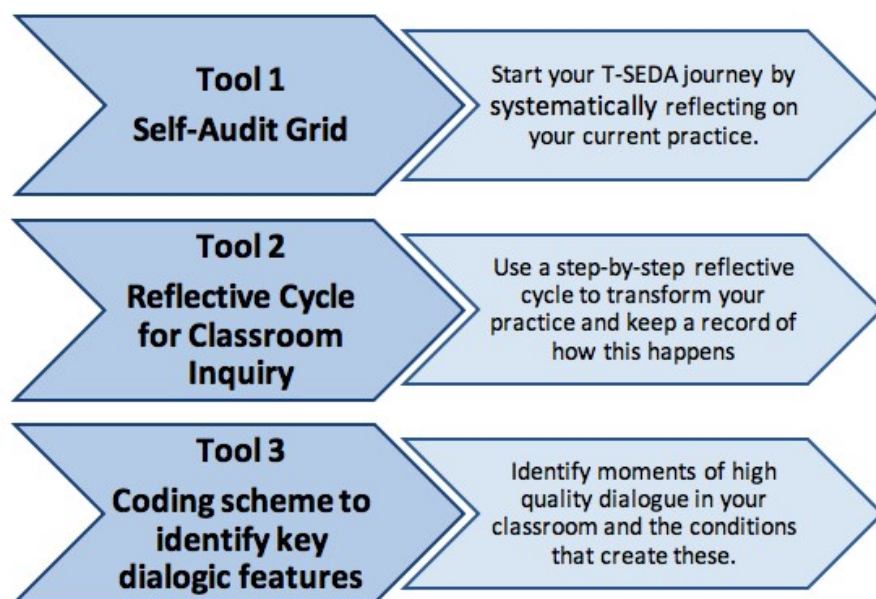


Figure 8.1: Three core T-SEDA tools

While the self-audit and the reflective cycle for inquiry may be fairly familiar parts of practitioner action research, the T-SEDA approach has a distinctive element in the focus on systematic observation and coding of classroom dialogue. The coding scheme is given in Table 8.1. This research-based scheme is adapted from an earlier, more fine-grained tool called SEDA (Hennessy et al, 2016). It draws attention to the different ways in which teachers and pupils may contribute to spoken dialogue. These ‘talk moves’ are signs that dialogue is developing in ways that are likely to be productive for learning. For instance, it was found in a recent study by Howe et al (2019) that learning gains in Year 6 (ages 10-11) were associated with talk in which contributors built on each other’s ideas (code B) and challenged other speakers’ views respectfully (CH). This research also showed that this sort of productive dialogue was strongly linked to active pupil participation, which is supported by the explicit use of ground rules for talk, as negotiated with pupils (Mercer, 2000).

Table 8.1: Coding scheme for classroom dialogue

Dialogue categories	Contributions and Strategies	What do we hear? (Key Words)
<b>IB – Invite to build on ideas</b>	<i>Invite others to elaborate, build on, clarify, comment on or improve own or others’ ideas / contributions</i>	‘Can you add’, ‘What?’ ‘Tell me’, ‘Can you rephrase this?’ ‘Do you think?’ ‘Do you agree?’
<b>B – Build on ideas</b>	<i>Build on, elaborate, clarify or comment on own or others’ ideas expressed in previous turns or other contributions</i>	‘it’s also’, ‘that makes me think’, ‘I mean’, ‘she meant’

<b>CH - Challenge</b>	<i>Questioning, disagreeing with or challenging an idea</i>	'I disagree', 'But', 'Are you sure...?', '...different idea'
<b>IRE – Invite reasoning</b>	<i>Invite others to explain, justify, and/or use possibility thinking relating to their own or another's ideas</i>	'Why?', 'How?', 'Do you think?', ...'explain further'
<b>R – Make reasoning explicit</b>	<i>Explain, justify and/or use possibility thinking relating to own or another's ideas</i>	'I think', 'because', 'so', 'therefore', 'in order to', 'if...then', 'it's like...', 'imagine if...', 'could',
<b>CA - Coordination of ideas and agreement</b>	<i>Contrast and synthesise ideas, confirm agreement and consensus; Invite coordination/synthesis</i>	'agree', 'to sum up...', 'So, we all think that...', 'summarise', 'similar and different'
<b>C – Connect</b>	<i>Make pathway of learning explicit by linking to contributions / knowledge / experiences beyond the immediate dialogue</i>	'last lesson, 'earlier', 'reminds me of', 'next lesson', 'related to', 'in your home'
<b>RD – Reflect on dialogue or activity</b>	<i>Evaluate or reflect “metacognitively” on processes of dialogue or learning activity; Invite others to do so</i>	'dialogue', 'talking', 'sharing', 'work together in the group/pair', 'task', 'activity', 'what you have learned', 'I changed my mind'
<b>G – Guide direction of dialogue or activity</b>	<i>Take responsibility for shaping activity or focusing the dialogue in a desired direction or use other scaffolding strategies to support dialogue or learning</i>	'How about', 'focus', 'concentrate on', 'Let's try', 'no hurry', 'Have you thought about...?'
<b>E – Express or invite ideas</b>	<i>Offer or invite relevant contributions to initiate or further a dialogue (ones not covered by other categories)</i>	'What do you think about...?', 'Tell me', 'your thoughts', 'my opinion is...', 'your ideas'

Another key feature of the T-SEDA approach is that users choose their own inquiry focus and appropriate tools and ways to explore it, adapting the approach to their own settings and prior knowledge about dialogue (see Figure 8.2). So T-SEDA does not offer a fixed programme of intervention or a 'recipe' for dialogic pedagogy. It is academic research-informed but actively practitioner-led. The T-SEDA pack has itself been developed in response to feedback from teachers. This is ongoing; indeed, at the time of writing in June 2019 it had reached Version 7c.

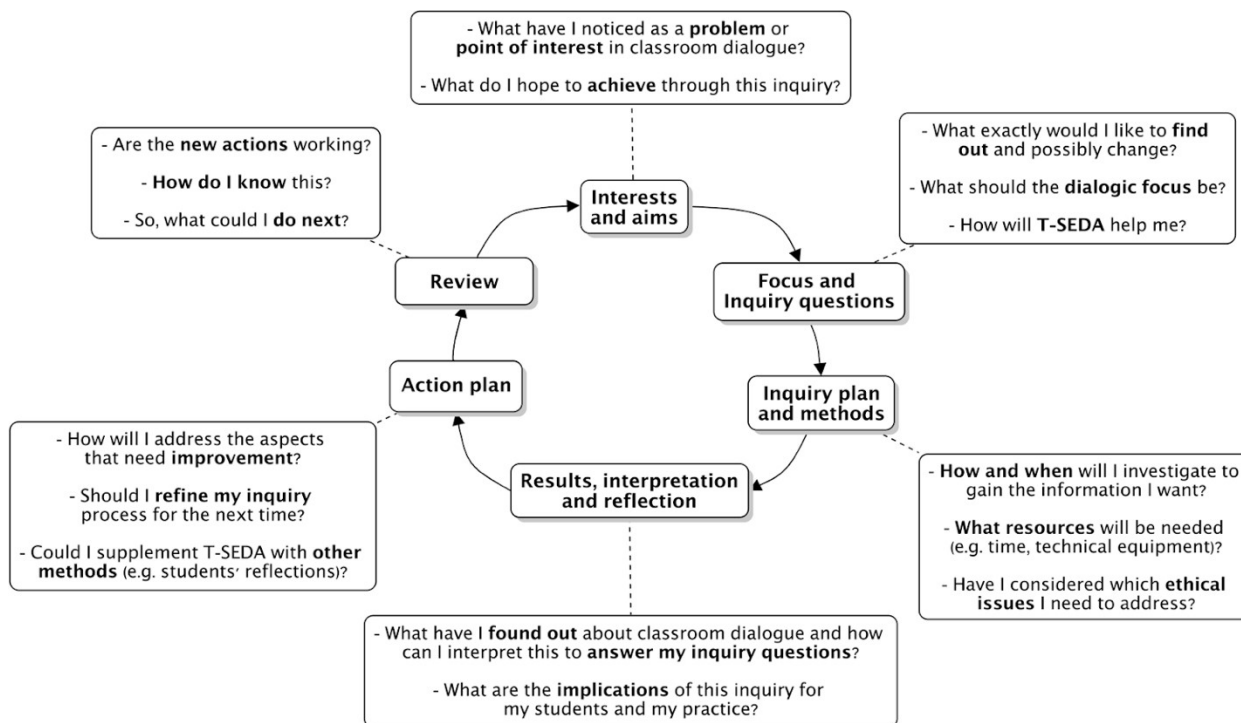


Figure 8.2: The reflective cycle for classroom inquiry

T-SEDA was designed to be relevant to teachers in any phase of education with application in any curriculum area. During 2018-19 T-SEDA was trialled by 81 practitioners in 7 countries (England, New Zealand, Israel, Mexico, Spain, Pakistan, Hong Kong), spanning early years to postgraduate students. This trial indicated that T-SEDA has a wide range of possible uses in diverse educational contexts. It proved to have distinctive potential for helping teachers to tune into classroom talk by undertaking detailed and systematic analysis of the quality of classroom dialogue and its impact on learning. Evidence from pre- and post-inquiry surveys, lesson video recordings, teacher reports and interviews, including individual teacher case studies, showed that significant, concrete changes in practice took place: dialogic activities and strategies were formulated, ‘talk rules’ were generated and used and students engaged more with their classmates’ ideas. The trial helped us to identify several ways in which academic-practitioner research partnerships developed in different contexts, including school networks and in-service courses in higher education as well as the in-house teacher professional development initiated by school leadership that we are writing about in this chapter. In most cases we found that local facilitators and research leaders held a crucial role in enabling practitioners to work productively with the T-SEDA materials, selecting and adapting tools as appropriate for their own purposes and contexts. Facilitators took on an important translating and brokering role between different stakeholders, resolving tensions such as managing conflicting aims and expectations. Reports and other feedback from teachers and facilitators contributed directly to our growing knowledge about dialogic pedagogy, manifesting the two-way dialogic approach for building knowledge between practitioners and researchers that was embedded in the original T-SEDA design. We next expand on this experience of using T-SEDA from practitioner perspectives.

### **3. Using T-SEDA in practice: teacher inquiry in the context of whole-school development**

In this section we present Kate's case example, looking closely at what she did with T-SEDA. Kate's inquiry was supported by her Deputy Headteacher, Hannah, in her role as professional development leader with a wider whole-school development perspective. The setting is an urban primary school where over a third of pupils are eligible for additional funding for disadvantaged pupils. Hannah gives her perspective first, then Kate describes her project.

Hannah:

In Summer 2015 our school was defined as 'coasting' according to government metrics. Improving the quality of teaching and learning was imperative but rather than snatching at quick fixes, as senior leaders, we were keen to develop an approach that would be sustainable over time and outlast changes in personnel. Therefore, we sought research-based solutions to the various areas for development that we identified.

Investment in teacher learning was essential in order to raise pupil outcomes and over the years has taken many different forms, including traditional professional development courses, coaching and mentoring and support from external consultants. We have committed to providing an ongoing programme of activities that staff can engage with and which will support them to reflect upon and develop their own practice. We have also been continually seeking to develop a culture within the school of 'continuous improvement' and encourage teachers to take risks, seek and try out new ideas and strategies and discuss their own work openly so that they feel confident to collaborate with and learn from each other.

However, my own personal research into teacher learning, undertaken for my Masters qualification, has highlighted the need for professional development that not only gives teachers a range of ideas and experiences but also the opportunity to develop their skills for systematically and critically examining these ideas and experiences. (Cordingley et al. 2015; Kazemi and Hubbard, 2008; Opfer and Pedder, 2010; Pedder, 2006). Being 'natural experimenters' requires teachers to move beyond reflecting on their past and current practice and to develop a 'critical mindset' that weighs up the benefits of alternative approaches and uses the evidence collected to think reflectively and reflexively about the consequences of particular choices.

As a school, we have adopted a layered approach to identifying and meeting professional development needs. First of all, quality assurance practices by senior and middle leadership across the school highlight areas of development which need to be addressed. The quality of classroom talk was one such area identified in this way. Over time, as senior leaders, we had become aware that while talk was being promoted in the classroom as an instrument for learning, it was not always being implemented as effectively as it could be. Although the idea of

‘dialogic talk’ had been introduced as part of our professional development conversations around the teaching of reading, through further discussion with teachers, it became evident that there was a lack of clarity about what constituted good quality classroom dialogue and how it could be promoted effectively across the curriculum and across the school.

Having pinpointed a particular need, the senior leadership team normally reflect on the possible options for bringing about change. These options can include:

- a ‘blanket’ approach in which all staff are required to engage with a series of development activities to discuss the modifications that we need to make to our practice across the school;
- an optional approach in which we offer developmental activities that staff can opt into, with a view to personalising their professional development and so allow them to follow their own interests;
- a directed approach in which we target particular teachers and provide them with opportunities for specific, developmental, support work.

As we were discussing our options, we were alerted to the Teacher-SEDA Impact Trial that was being conducted by the CEDiR group at the Faculty of Education. The invitation we were sent invited us to participate in a ‘teacher-led inquiry’ on the quality of dialogue in the classroom. Again, through my own research, I had become aware of the work of this particular research group and knew that the focus of the project aligned with the needs that we had identified. In addition, the focus on ‘teacher-led inquiry’ also promoted the systematic and critical examination of ideas which we consider to be an important part of teacher learning.

However, while we felt that engagement in the project would be beneficial for all, we were aware that additional expectations might possibly be placed on teachers through their participation in the project. Consequently, we decided that an optional approach would be best and therefore advertised this professional development opportunity to all staff yet with no expectation that they become involved. When eight teachers expressed an initial interest in becoming participating, we discussed with Sara and Ruth the possibility of conducting a workshop in school as part of a school INSET. We requested that part of this workshop be open to all teachers, so that they could all be introduced to the principles of dialogic talk. We felt that this would raise the profile of classroom talk across the school and develop a school-wide understanding that would support the transfer of knowledge from individual inquiries to whole-school practice.

Kate:

After attending Ruth’s T-SEDA workshop on dialogic talk, I was very interested in the opportunity to be involved in the development of this teaching strategy in our school and was keen to be a case study. Initially my inquiry centred around students developing their discussion skills by encouraging them to question each other’s ideas and challenging each other to make their reasoning clear. First I tried a few discussion activities in which

my children were encouraged to use question stems such as, ‘Can you....?’ ‘What if...?’ ‘Why...?’ in order to probe each other’s thinking to draw out their reasoning. However, it soon became apparent to me that the children in my class found it hard to take on the questioner role. This led me to think that the children were still at the stage where they needed an adult to support them in guiding and deepening discussions during dialogic talk.

As the year progressed I became further interested in the impact that using dialogic talk in the classroom could have on outcomes in English and in particular, Guiding Reading. As the school English leader, I had been developing whole class reading, focusing specifically on the reading skills that the children needed to acquire and develop in Key Stage 2 (ages 7-11); dialogic talk seemed to complement what we were trying to achieve in this subject in order to raise standards. I particularly felt that dialogic talk really supported in developing student’s inference- making skills, allowing them to become better at justifying their opinions and ideas about a text by referring to evidence. Dialogic talk also provided the students in my class time to discuss and develop their opinions of a text before engaging in written work.

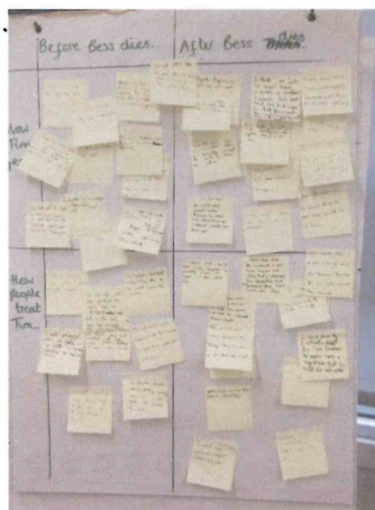
Following the workshop, I identified several strategies that I was keen to trial. One of these was using ‘Talking Point’ statements as a stimulus for dialogic talk as I felt this would work well in the English context with my own class. I implemented this into a plenary for an English lesson on Alfred Noyes’ poem, ‘The Highwayman’. In this lesson we focused on the verse about Tim the Ostler.

Box 1: A verse from ‘The Highwayman’ by Alfred Noyes

Dark in the dark old inn-yard a stable-wicket creaked  
Where Tim, the ostler, listened--his face was white and peaked  
His eyes were hollows of madness, his hair like mouldy hay,  
But he loved the landlord's daughter  
The landlord's black-eyed daughter;  
Dumb as a dog he listened, and he heard the robber say:

We inferred that he was the person who alerted the red-coats to the fact that the Highwayman could be found at the inn. We looked at various visual representations of the Ostler and discussed his character and other character’s opinions of him in the story before launching into a plenary class discussion about the statement ‘Tim the Ostler is an evil character’ which I recorded. Figure 8.3 illustrates some of these discussions.

Next we worked in pairs to think about Tim's feelings at different points in the story and how other character's might treat Tim both before and after Bess's death.



Finally we had a in depth class discussion about the statement:

*Tim the Ostler is an evil character.*

We built on each other's ideas, disagreed respectfully and even challenged each other's views.

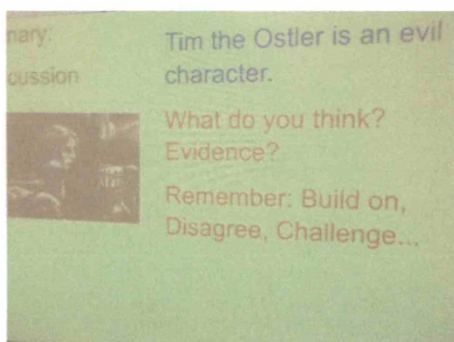


Figure 8.3: Photos documenting dialogue around Tim the Ostler's character

After the lesson I transcribed and coded this discussion (see Table 8.2). Through coding the discussion, I found that students were making good use of the sentence stems I gave them to discuss the statement, and were able to provide justifications when prompted. Students were engaged and eager to take part. Some of the children with special educational needs, who were usually reluctant writers, took important roles in the discussion (Callum, David and Cory in this transcript).

Table 8.2. Discussion about Tim the Ostler's character

Line No.	Speaker	Code (Table 8.1)	Turn
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1.	T		So my statement is 'Tim the Ostler is an evil character'. What do you think? Why do you think that? Do you agree with everybody? Let's start over here with S1.
2.	Callum	CH	I would like to challenge you because um Tim is just jealous and um sad and that can make you grumpy and when you're sad and jealous all it does is fill your mind with um grief and so all you can't think about anything else but what you want- so it's not necessarily evil.
3.	David	B	I agree with Callum because like I don't think he's an evil character I just think jealousy took over his mind and he just really wanted Bess for himself.
4.	T	IB	Ok so you don't think he is evil you just think the jealousy has warped his mind. I like that idea. Anybody want to build on or challenge that?
5.	Cory	CH	I disagree because I think Tim is an evil character because he put the girl that he loved in danger and he could one lose his job and two he could never see the woman that he loves again.
6.	T	CI	So you think he actually is evil because what he's done he has actually put Bess in danger and that's the woman he is supposed to love.
7.	David	CH	I challenge you because um well I don't think he didn't actually know that Bess was going to get hurt or killed or anything so I have to disagree.
8.	T		OK so you think he did that without having any knowledge that that was going to happen. I like this conversation.

I was pleased by how the students were usually able to give lengthy and well-justified opinions about the text, challenging and agreeing with each other. Although I was involved in the discussion, I tried to refrain from giving my own opinions (withholding evaluation) and took the role of the questioner, encouraging the children to justify their opinions. It was interesting to note how one vocal student, after listening to others' ideas, was

able to acknowledge a shift in his own opinion about the character, showing how dialogic talk encourages children to really listen to each other as well as share their own thoughts:

Callum: I've changed my mind because everyone who is saying Tim the Ostler is evil is persuading me because he did put his - the person he loved- in danger and if he did truly love Bess he would have left her and he may have known how horrible the red- coats may have been because he may have seen them in action before.

Overall, taking part in the T-SEDA enquiry really supported me in reviewing and changing the role I take in classroom dialogue, allowing the children to develop the discussion and their opinions and thoughts without me intervening. Furthermore, analysing written outcomes showed from the children's responses to inference type questions that the dialogic talk had had a positive impact on their understanding of texts. I particularly noted the children's development of inference skills and ability to answer comprehension questions using evidence from the text, echoing the classroom talk in their writing. Figure 8.4 gives one example of a child's ability to write clear answers, justified by evidence in a concise way, that was clearly developed through the use of high quality dialogic talk in Guiding Reading lessons.


Week beginning 18th March 2019

L.O. To justify inferences using evidence from the text.

Text: Winter Pruning by Chris Priestley

Task: Discuss the statements you have been given.

Do you agree or disagree with the statements? Back up your ideas with evidence from the text.



Simon is scared of Old Mother Tallow.

I disagree because if Simon was scared then he wouldn't go back to Old Mother Tallow's house to rob her. Also that means she told him to go away. Simon was rude back to her, which shows he isn't scared of Tallow.

The boy is the bad character in the story.

I disagree because even though he was going to rob Old Mother Tallow in the text it says he was sick of stealing pennies from his mother's purse. Also the text says he was tired of hearing how little money his father had left them and maybe he was just stealing to help his mum.

Old Mother Tallow is a witch.

I agree because she has long and gnarled fingers and in the text it says 'her eyes were as frosty as the grass,' which shows she could be a witch.

Figure 8.4: Example of written outcome in a child's Guiding Reading Journal

This particular lesson was videoed and the Faculty research team compared it to another I had taught earlier in the year, before encountering T-SEDA. Elisa led this process, outlined in Figure 8.5.

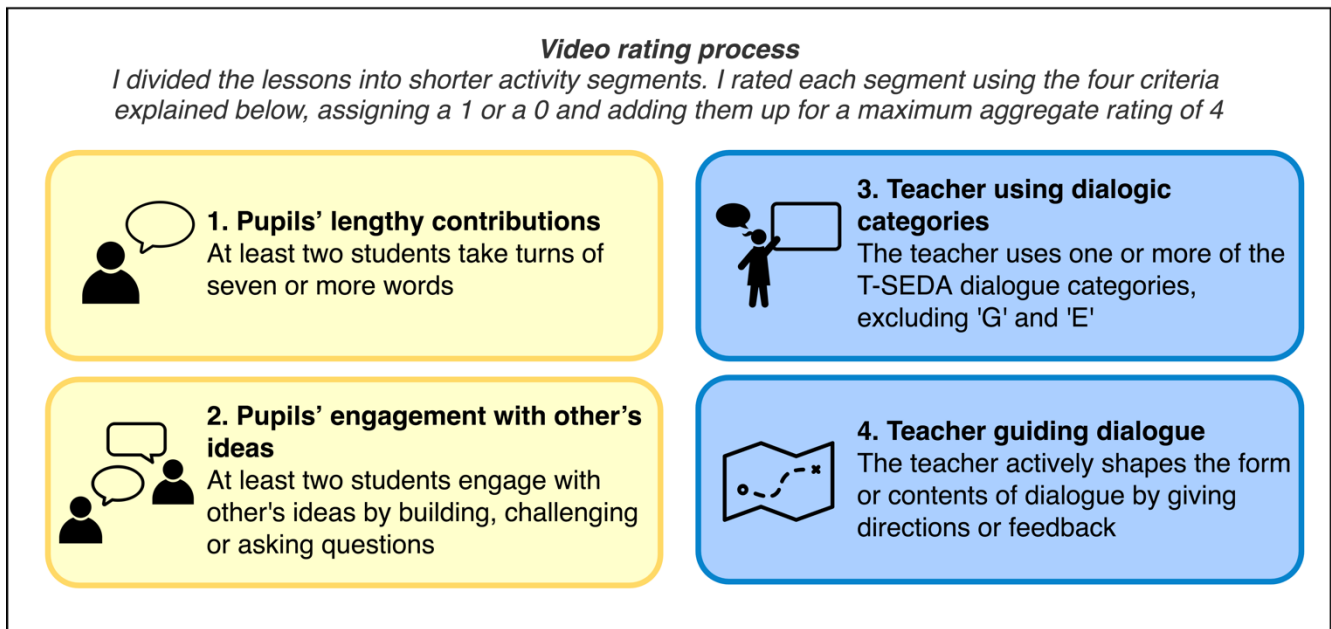


Figure 8.5: Elisa's account of her video analysis rating of classroom dialogue

The proportion of lesson time with different ratings was compared pre and post inquiry using Elan software (ELAN, 2018), to assess whether dialogic segments (rated 2 and above) had increased. As shown in the charts in Figure 8.6, 75% of the initial lesson time had low levels of dialogue, which fell to only 35% in the final lesson. This lay in comparison to the final lesson where around a third of the time was considered to have 'medium' quality dialogue and another third was considered 'high' quality. This increase related to the number of lesson segments that were rated positively under criteria (1), (2) and (3) but not under (4), i.e. the dialogic talk increased with a reduced amount of teacher guidance.

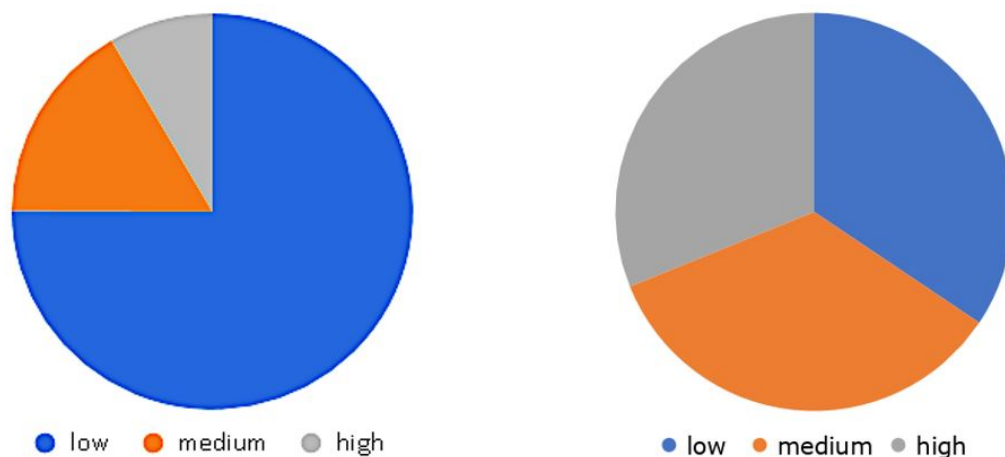


Figure 8.6. Proportion of lesson time with different levels of dialogue from initial (left) to final lesson (right)

It appeared that the areas of focus – ‘talking points’, ground rules for talk and use of sentence stems such as “I disagree...” – proved very fruitful. Observers noted in the videos a shift in the classroom dialogue norms from short answers to discussions in pairs followed by whole-class discussion segments where students gave lengthy and well-justified answers, building on and challenging each other’s ideas. The latter was especially rare in the initial lesson, indicating that students were taking on the new practices and ultimately able to successfully contribute to rich discussions. (Three video clips from Kate’s final lesson are available to view online; see the first and links to the others at <https://sms.cam.ac.uk/media/3212641>).

#### 4. Thinking together about supporting and valuing teachers as ‘natural experimenters’

To reflect further on Kate’s inquiry, and with reference to Hannah’s perspective as a senior leader, we now draw on a dialogue between four of the authors of this chapter about how T-SEDA worked in this school context and the wider lessons that might be drawn from this experience. To structure this discussion, we used the ‘Talking Points’ method (see Box 2), as already referred to above by Kate. Dawes’ (2012:1) explanation of Talking Points brings out why this approach seemed so suitable for our own purposes, bringing together our different perspectives:

Talking Points are statements that encourage children to talk to one another about a topic, sharing what they know and understand... They help children to focus on the topic in hand, and to compare their point of view with that of others... The statements might be right or wrong; they might suggest interesting or unusual ideas, or simply stimulate discussion that will elicit children’s current thinking... Talking Points are not questions. They require creative, analytical or evaluative thinking; they require children to provide reasons for what they say.

## Box 2. Talking points about professional development, dialogic practice and research partnerships

- 1) Schools and teachers are very different in their professional development needs.
- 2) There's a big divide between research and practice.
- 3) Research partnerships are useful, but they add to teachers' workloads.
- 4) Teachers are natural experimenters, but some need more support than others.
- 5) Inquiry and dialogue are two sides of the same coin, for learners and teachers.
- 6) Systematic observation of classroom dialogue calls on teachers to learn and apply new skills.
- 7) Teachers' professional development doesn't work without a whole-school approach
- 8) It is difficult to translate research into practice
- 9) The most effective forms of PD are .....
- 10) Collaboration can be useful, although professional development works very well when teachers work individually.
- 11) It requires a school-wide effort with all involved for teaching to become more dialogic

Opening up this conversation about professional development, dialogic practice and research partnerships enabled us to reflect together on T-SEDA with our multiple perspectives on research and practice. Analysing the transcript of this discussion then helped us to identify some key aspects of what is involved in supporting and valuing teachers as 'natural experimenters' in developing classroom dialogue, as seen in the extracts that follow (with key ideas in bold):

Extract A: Creating conditions for teacher experimentation: using tools and sharing ideas

Extract B: Identifying and embedding dialogic talk

Extract C: Increasing awareness of dialogue through engagement with systematic observation and coding

Extract D: Perspectives on research partnership and collaborative professional learning

Extract A highlights an idea at the centre of this chapter: teachers as 'natural experimenters'. The discussion also raises three key elements involved in supporting teacher experimentation: the professional conditions that make purposeful experimentation possible, the tools that can be used in experimentation, and the importance for teachers of having opportunities to share ideas that can guide experimentation.

Box 3. Extract A: Creating conditions for teacher experimentation: using tools and sharing ideas

*Ruth: I think it was you, Hannah, who came up with the phrase “teachers are natural experimenters”, which we immediately grabbed and made for the title of our chapter.*

*Hannah: Yes. That is what I said I wanted.*

*Ruth: That is what you wanted. So, that is something to grab onto.*

*Hannah: Teachers to be natural experimenters. That is the approach I want teachers to have.*

*Ruth: But that means you have got to create the conditions in which teachers can follow their inclination.*

*Hannah: Yes.*

*Kate: I think I agree with Hannah. **There is that element of experimenting as a teacher: you want to try new things out, but I think, also, you need to get ideas as well and then experiment with ideas and twist them and turn them and use them in ways, in your own class, perhaps, that they haven’t been used before. So, I think the sharing is actually massively important towards teachers then having ideas to go and experiment with. Does that make sense?***

*Ruth: Absolutely.*

*Hannah: So, then, in that respect, the T-SEDA worked, because, actually, that gave us the tool and the ideas for us to then go and experiment with.*

In Extract B we see how the use of tools, like systematic observation and coding, can help to clarify the focus and goals of inquiry: experimentation needs clear identification of what we are looking for in classroom dialogue and how we know whether changes have happened. This is important, also, in seeing whether children are generalising their learning to other contexts (such as in art with Hannah) and, as Kate says, beginning to ‘do it naturally’.

Box 4. Extract B: Identifying and embedding dialogic talk

*Hannah: Yes. I am using the T-SEDA within lesson study. . . . I am coding my teacher transcript using the T-SEDA coding, to see whether their talk is dialogic as well.*

*Sara: Wow! That is great.*

*Ruth: Great!*

*Hannah: But, what has been really interesting, I think, for me, was having that coding meant you understood what was meant to be, what you would consider as part of classroom dialogue to be dialogic and what you wouldn't, because **I think that we all know that talk goes on in our classrooms, but actually knowing which of the bits that I really want to be promoting, as opposed to the bits that actually aren't going to be as useful for the children's learning, is actually quite a good thing to open people's eyes to. And I think the coding, particularly the sentence stems with that, helped as well.***

*Kate: Yes, the sentence stems are brilliant.*

*[...]*

*Kate: I put them on my interactive whiteboard and we talk about them, but they kind of know them, to be honest, now. So, it is quite, I suppose, embedded.*

*Hannah: It is, because I did Art in your class the other day. I asked them: 'What is art?'*

*Kate: Oh yes.*

*Hannah: And I gave them loads of pictures, and then said, 'So, tell me, what is it?' and then we were having this big conversation about it, and they were like, 'But I'd like to just build on what So-and-so was saying.'*

*Kate: They do do it just naturally.*

*Hannah: Yes.*

*Kate: And that is really good. What I like about it is because they are actually listening to each other, which, I think, with a lot of classroom dialogue, the children just want to tell you. And this is definitely lower down, when you are teaching infants [ages 4-7], they just want to tell you what they know because they just all want your attention. But, for them to be able to take part in dialogic talk, they almost have to listen to the other person, otherwise they can't participate. So, it forces them to listen.*

Extract C goes further in reflecting on systematic observation, and the skills required in this approach. The discussion develops towards consideration of the potential effects of systematic observation in ‘stopping time’ and increasing awareness of the signs of productive dialogue.

Box 5. Extract C: Increasing awareness of dialogue through engagement with systematic observation and coding

- Kate: Let me have a look. What about: “systematic observation of classroom dialogue calls on teachers to learn and apply new skills”?
- Ruth: OK, there we are. Right. Sara, what do you think?
- Sara: I am all for systematic observation. I like the notion of being systematic. I think it goes back to what Hannah was saying earlier, actually, about her experience of coding; that you have got talk in a classroom and you think that is all great, but you are not exactly sure which bits of it might be productive for learning. So, if you look at it systematically and code it, you can then emphasise those bits a bit more. And I think it is maybe not something that teachers have often done before. It is not something in the training and it is not expected. So, maybe it is new, in which case I think it does require very new skills. Not complex skills.
- [...]
- Hannah: I would say that I have had to learn a whole new set of skills, if I am thinking back to last year and this year, in terms of doing educational research in school, I have had to learn a whole load of new stuff, which has been quite exciting.
- Ruth: What have you had to learn?

In Extract D, the discussion extends to more general thinking about research partnerships and collaborative professional learning. As can be seen in this extract, we were sharing conceptualisations of the meaning of ‘research partnership’, including its dynamic and cyclical nature in creating knowledge and understanding.

Extract D: Perspectives on research partnership and collaborative professional learning

Ruth: Are there any other ways in which you understand the meaning of research partnership, what that would mean? What do we mean from our perspective, Sara, research partnership? Sometimes these words trip off the tongue, don't they? What do we mean by research partnership? It doesn't mean we are doing the same thing. A partnership can be people with different goals, ultimately, but working together to achieve those different goals or creating something new in doing that. That is interesting, isn't it, that you get more from the partnership than you do from separate partners working independently.

Kate: In a way, I have viewed this almost like a picture, and then you have got you in the middle and then we will be like a leg of your spider and then there will be lots of other legs with other schools I know you are working with. So, I would see us as a tiny little part of all of the research you are doing, and then you will take that research and, basically, organise it and decide what has worked well, what hasn't worked well, and you would share that with us, and then we would be able to move forward even more. I don't know. That is how I would see it.

Ruth: I am seeing that in my head.

Kate: But we are a tiny little bit of what you are doing and that, by being that tiny little bit, we might learn more things that, in the future, we will be able to put into place.

Ruth: That is also a process you have described, isn't it? It is not just a one-off. It is not a static thing.

Kate: Yes.

Hannah: Yes. So, it comes back and it keeps going on. It is a cycle, isn't it?

Kate: Yes. That is what you would hope. It wouldn't just be, 'We have done this and that is it, and I will go off into the sunset.'

Hannah: Which doesn't happen with all projects.

Kate: 'I am never going to dialogic talk again. Forget the sentence stems!' But, actually, there would be some sort of continuation.

Hannah: But I wonder whether that depends on the nature of the project.

Kate: Yes.

Hannah: Because I think some of the ones we get involved in are testing something, and, therefore, actually, there is a finite end point, whereas, actually, this is more infinite.

Sara: Yes. Maybe those ones are less of a partnership and more just you being involved in research.

Hannah: In facilitating that.

Sara: Yes. I think, for me, the term research partnership means that both parties are getting something out of it. So, we are learning from it as well. So, although your diagram is fairly accurate, in a way, that we have lots of other schools, but all of the parts are really important, especially case studies are even more important because we go in more depth with those and with certain sites and people. So, we learn even more from those.

So, we learn about how dialogue can be used in the classroom, how resources can be used to help support that, but also we learn about the process; so, just having this conversation now, having had the interviews and so on, helps us learn about the whole process of sharing our other research with teachers and with schools in a way that makes it helpful for practice.

Kate: And, I think, part of it, if I had just read about dialogic talk and T-SEDA or somebody had just told me about it, I wouldn't have had the knowledge, perhaps, that I have after two and a half terms of actually having a go at using it. So, I think, from my point of view, it has really been useful in that it has definitely deepened my understanding of what dialogic talk really is and how you can use it in your classroom really effectively. So, I have definitely got a lot out of it.

## Conclusion

From a research perspective, T-SEDA was developed as a resource that is both inquiry-focused and dialogue-focused. It encourages an 'inquiry stance' by teachers that lies at the core of effective professional learning, valuing teachers as 'natural experimenters'. The idea of 'inquiry stance' has roots in the work of influential scholars like Lawrence Stenhouse, pioneer of action research, who described the importance of teachers' willingness to take a 'research stance' (Stenhouse, 1975: 156).

As highlighted in the previous section, supporting teacher experimentation requires attention to the conditions that make purposeful experimentation possible, the tools that can be used in experimentation, and the importance for teachers of sharing ideas that can guide experimentation. One of the key areas of support in this case lies in the clear identification of what dialogic talk is (and what it isn't). This then allows teachers like Kate to review the quality of talk in their own classrooms and identify which parts need to develop. Specific approaches emerge as distinctively important in this area, not only from Kate's case but from the wider international T-SEDA trial findings. These include:

- video or audio material to reflect on
- sentence stems to promote dialogic talk
- opportunities and willingness for reflection with a self-critical and reflexive approach
- a framework for structuring inquiries over manageable periods of time, possibly including agreed deadlines and opportunities for 'supervision' discussions about progress

The T-SEDA trials so far have helped to identify different levels of activity at which researchers can engage with practitioners to make 'impact' happen collaboratively and dynamically. In this case, the initial whole-school approach involved all teachers in the first workshop before encouraging some teachers to conduct individual inquiries. This meant that other teachers were also challenged to develop the principles too and all

staff had a common language. So discussions about dialogic talk could continue elsewhere in the school, not just amongst those teachers who were involved in the T-SEDA project.

In thinking about the role of research partnerships in professional development we conclude with a quote from Kate, based on her T-SEDA inquiry experience. This encapsulates many of our conclusions about the constructive ways in which professional change can happen:

Personally, I think really effective forms of professional development within schools are, from a teacher point of view, collaborative. I think, when people work together, when you share ideas, when people get a chance to observe each other, I think that is really, really powerful, but it, obviously, has to be chosen carefully so that people are going to observe with a goal in mind, and that you have identified something specific that you want them to take on, when you have that shared planning time, and it has to be supported as well....

I think the T-SEDA definitely does have elements of that. So, the fact that you get observed and you can watch back your lesson, although that can be stressful, actually, if you go in with the right frame of mind, with reflecting on it and no one is judging you, then it is really, really powerful. I think having the discussions about it ... and having that time to reflect and then go away and squirrel away and do something else, and notice areas that you need to improve on, but do it without that pressure, 'Oh my God, I've got to do this,' is really, really powerful.

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