UNIVERSITY OF CAMBRIDGE
Faculty of Education

CEDiR
CAMBRIDGE EDUCATIONAL DIALOGUE RESEARCH GROUP

TEACHER SCHEME FOR EDUCATIONAL DIALOGUE ANALYSIS

(T-SEDA)

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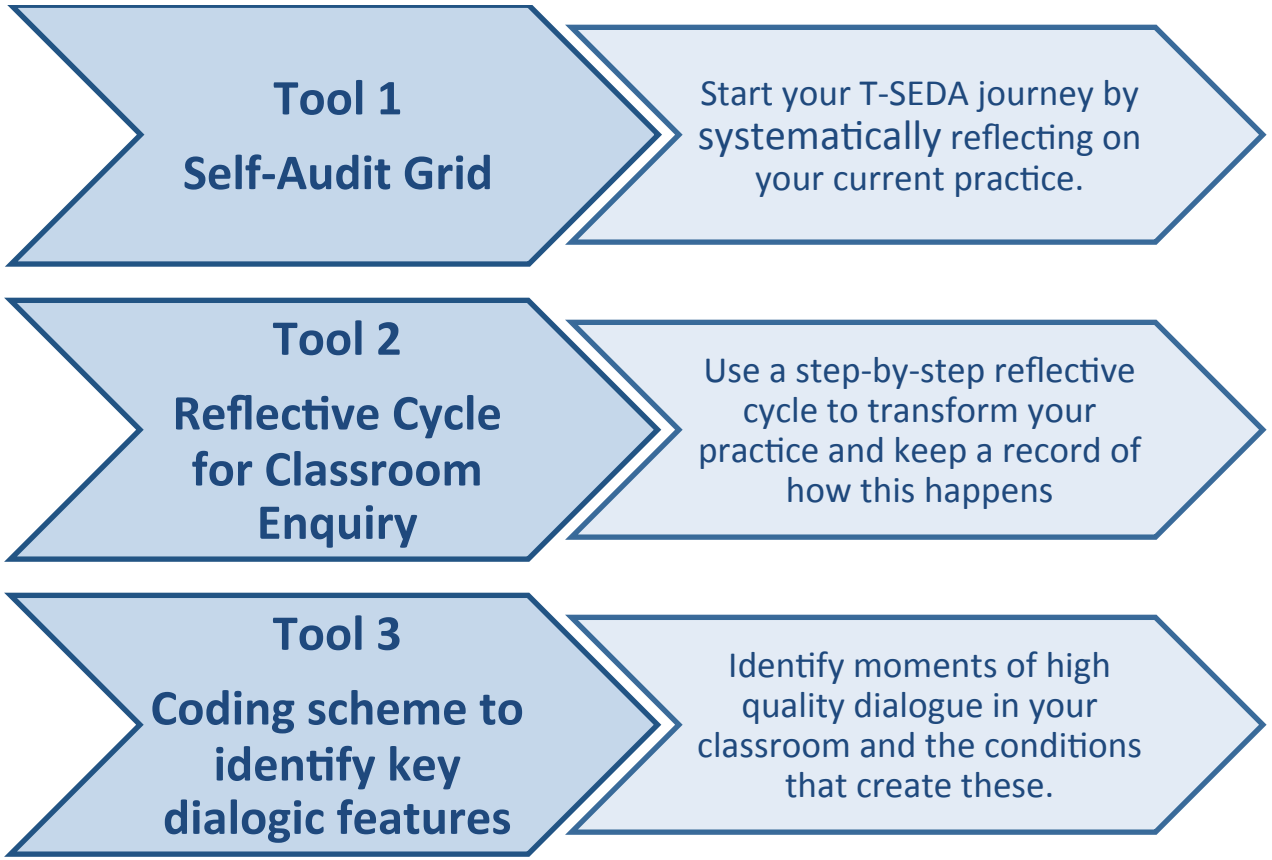
How does the T-SEDA pack work in practice?



This pack is designed to be flexible for conducting an inquiry on whatever interests you in relation to educational dialogue.

Try out T-SEDA in your classroom and send us feedback (T-SEDA@educ.cam.ac.uk). We would love to hear from you!

Examples of T-SEDA in use

Building dialogue in role-play

*Using the self-audit tool, Gary, a Reception Class teacher, wondered how far children in his class responded to each other in the role-play area. He decided to look for instances of how the children **built on each other's ideas**, seeing this as being the foundations of dialogue between them.*

He found that some children were able to develop their creative expression in their talk with others. However, other children tended to played on their own in the role-play area, focusing on dressing up and playing with objects, as opposed to listening to what other children were saying and responding to them.

Gary decided to ask children if they wanted to play in pairs in the role-play area and to share ideas about how to play. Following this intervention, he found that children would only respond to others if they were excited about their ideas. Nevertheless, it enabled some children to become more aware of others as potential play partners. And it gave Gary some ideas about what to do next to encourage dialogue between them.

Interrogating each other's ideas in history

*Using the self-audit tool, Kiran, a secondary history teacher, wondered if her students understood how to interrogate other's ideas about sources. She decided to observe how much **querying and challenging of each other's ideas** was happening in pair work looking at a source. She believed it was important for students to reflect on their own learning and become aware of the importance of querying others' ideas.*

Unbeknownst to the students working in pairs, she asked some other students to use a grid to make a tally of how many times each student in the pair queried or challenged over a 10-minute period. She then asked the 'observer' students to feed back to the class on how much of this went on and what happened next. This led to a productive discussion in the class about querying and challenging each other's ideas as well as the source itself.

Developing reasoning in science groupwork

*Using the self-audit tool, Lily, a year 5 teacher was concerned that there wasn't enough **reasoning** happening in her classroom. She decided to use the T-SEDA coding scheme to identify how many times **reasoning** occurred in children's groupwork during science lessons.*

*She used live observations of certain groups to record instances of **reasoning** over a series of science lessons. She found that some children contributed reasoning fairly often, but others didn't reason publicly at all. She began to see a pattern in that the 'group leader' did most of the reasoning. This enabled Lily to think about what interventions she could make to facilitate all children in a group to reason together when solving problems in science.*

PACK CONTENTS

The T-SEDA pack contains these sections:

- **SECTION 1: Introduction.** Contains an overview of the approach and the underlying dialogic principles.
- **SECTION 2: Coding framework** A list and explanation of dialogue categories illustrated with sample prompts and contributions, plus more general dialogic classroom practices.
- **SECTION 3: Developing dialogic practice.** Suggestions for incorporating dialogic learning and teaching into practice and for developing the classroom learning environment to support dialogue.
- **SECTION 4: Identifying aims, interests and inquiry focus.** Includes advice on choosing specific dialogic categories from the T-SEDA framework (usually one or two categories at a time).
- **SECTION 5: Observation methods including technical guidance for audio/video recording and transcribing.**
- **SECTION 6: Templates for observing and coding.** Includes lesson observation (time-sampling; checklist; rating scales).
- **SECTION 7: Worked examples** Illustrates teachers' coding and interpretation of dialogue in different contexts; includes teachers' findings and next steps.
- **SECTION 8. References to other research on dialogue and links to related resources**.

Some parts of the pack are separately downloadable for printing or editing; look out for the  *icon*.

SECTION 1: Introduction

What is educational dialogue?

Educational dialogue grows from people's active involvement in developing ideas together in talk. The aim of this pack is to help you evaluate and improve the quality of the educational dialogue in your classroom. Educational dialogue enables teachers and students to *think togeth*er and develop relationships that support collaborative learning.

The Teacher Scheme for Educational Dialogue (T-SEDA) resource pack has been designed to support you in generating high quality educational dialogue in your classrooms. Teachers continuously reflect on classroom events, however they rarely have the opportunity for fine-grained systematic observation. The T-SEDA pack offers you three tools that have been designed to support systematic observation and detailed reflection. They are based on the latest research findings about the importance of generating high quality educational dialogue to have an impact on children's thinking and attainment.

Tool 1 - A Self -Audit Grid **(See page 8)**

Tool 2 - A Reflective Cycle of Classroom Inquiry **(See page 10 and Section 3)**

Tool 3 - A Coding Scheme that is specifically designed for investigating classroom dialogue (Section 2)

This pack includes much information about educational dialogue in later sections. Some of the key ideas and tools are summarised next:

1) Educational dialogue and student learning
2) Self-audit: How productive is the dialogue in my classroom?
3) Reflective inquiry and teaching
4) Analysing classroom talk: systematic observation and coding
5) Uses of the T-SEDA pack
6) The importance of classroom dialogue: further insights from research
7) Keeping educational goals in mind: working with teachers to develop T-SEDA

1) Educational dialogue and student learning

'Dialogue' does not just mean any kind of talk. In dialogue, participants listen to each other, they contribute by sharing their ideas, justifying their contributions and engaging with others' views. In particular they explore and evaluate different perspectives and reasons. Relevant questions and contributions are linked between speakers, allowing knowledge to be built collectively within a lesson or over a series of interconnected lessons. Although verbal interactions are central, dialogue can be supported with non-verbal communication (e.g. gestures, facial expression and eye contact) and by using visual or technology resources. Silence, physical movement, classroom routines and ethos can also be important aspects of dialogue, framing and supporting (or sometimes hindering) the spoken conversation that is the main focus of this pack.

Educational dialogue takes different forms with students of different ages, from the youngest to oldest, and it can be developed in different areas of learning. Some features of productive educational dialogue already appear in many classrooms but sustaining productive educational dialogue takes time. It might also challenge participants, especially if they are not used to expressing their views at length or having them examined publicly.

A series of research projects* has indicated what kinds of 'talk moves' facilitate high quality educational dialogue and learning:

Which talk moves are strongly associated with learning gains?

- **elaborating and building on ideas**
- **invitations to elaborate and build on ideas**
- **querying – i.e. respectfully challenging and questioning others' views**

Which are the most supportive elements of dialogue at the classroom level?

- **active student participation** – multiple students give extended contributions and engage with others' ideas
- **explicit use of talk rules** – ground rules supporting dialogic practices, negotiated with students

These features of productive dialogue need to occur together to have a significant impact on learning.
Too much querying without the other supportive elements can even have a negative effect!

** These findings came from a project supported by the UK Economic and Social Research Council (ESRC) involving detailed analyses of 144 lessons by 72 teachers in 48 English primary schools (http://tinyurl.com/ESRCdialogue).*

2) Self-audit: How productive is the dialogue in my classroom?

You may want to begin by conducting a self-audit. Bear in mind that sometimes we understand audit statements differently.

For example, a ground rule, such as **'we all trust and listen to each other',** carries different layers of meaning relating to the following elements*:

- fostering interpersonal relationships
- hearing everyone's ideas
- learning from each other's thinking

As a first step, consider: what is your general impression of whether these three elements of dialogue are in balance in your classroom? Is one emphasised more than others?

Secondly, go into more detail by using the self-audit table (page 8) and rating the points that apply to your classroom as:
(1) rarely **(2)** sometimes **(3)** usually

Finally, look back at the three elements above and consider whether they need rebalancing, and why?

This self-audit can be a useful tool for reflection to focus your inquiry and to monitor what happens as you go along. It can be helpful to repeat it.

In looking at each self-audit item you may ask yourself: **What do these mean in my practice and how do I know they are actually happening?**

Your thoughts about this can feed into your Reflective Cycle of Inquiry (see page 10 and Section 3)

** This distinction between the three different layers and elements of classroom dialogue was highlighted in a large-scale mixed methods intervention study on classroom dialogue in teaching science and mathematics (www.educ.cam.ac.uk/research/projects/episteme/).*

Self-Audit: Supporting development of dialogue in the classroom 

Reflect on learning and teaching in your classroom and rate each statement using: **(1)** rarely **(2)** sometimes **(3)** usually

In my teaching, do I… ?	**My rating**	**In our classroom, do we… ?**	**My rating**
• value student talk in my lessons and plan for it to take place in groups and whole-class situations • ensure that everyone participates sometimes in classroom dialogue, including myself • take account of children's individual needs and interests when developing dialogue • encourage children to be responsible for their own learning (individually and collectively) • invite children to elaborate and build on their own and others' ideas • invite children to give a reason for their ideas and opinions • invite children to ask each other questions about their ideas • support children in a range of ways to enable them to share their ideas, views and feelings • build on children's contributions to advance the dialogue using my own subject knowledge and understanding • take risks and experiment by trying out new dialogic teaching approaches • listen to students, give feedback and respond in a constructive way • use classroom resources, including technology, in dialogic ways to help children in their learning		• create an inclusive classroom conversation • trust and listen to each other • express a range of views • challenge each other respectfully • explain our reasoning clearly • have the willingness to sometimes change our minds • sometimes come to agreement • help each other to understand things in a new way • build new knowledge together • extend and refine what we already know • continue a dialogue over time, from lesson to lesson • realise what we still need or want to learn and how we might like to do it	

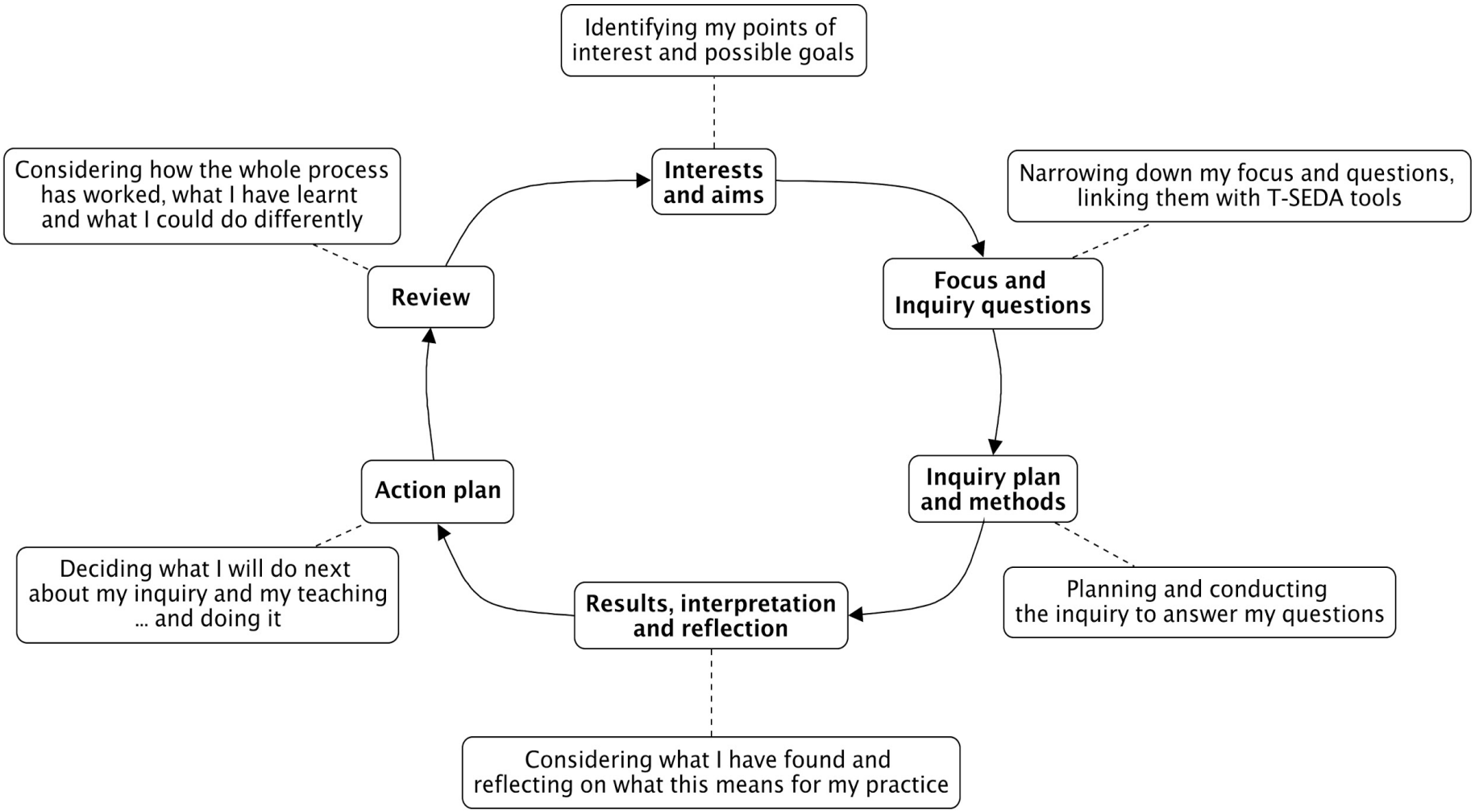
3) Reflective inquiry and teaching

The approaches outlined in the T-SEDA pack are grounded in the belief that **reflective inquiry** lies at the heart of teaching. This can involve individual self-reflection as well as collaborative professional development between teacher colleagues. Students are also part of this process and may be encouraged to discuss their own classroom communication and learning.

T-SEDA is particularly suited to situations when teachers have identified a particular interest in or concern about classroom talk and learning. Focusing **'inquiry questions'** and conducting a **short classroom investigation** can help you target attention, sharpen awareness and build understanding of what is actually happening in the fast-paced classroom setting. Reflecting on observational evidence and further discussion with colleagues can support subsequent decision making about setting priorities for your classroom and deciding whether and how to intervene. This inquiry process resembles school-based action research, in which knowledge and understanding are developed through iterative cycles of planning, classroom trialling, observation, evaluation, and reflection and modification. This cycle should connect well with other professional practices and approaches to action research that you are already familiar with.

The Reflective Cycle of Inquiry  is intended to represent how the use of the T-SEDA materials may help you solve problems, building further understanding and generally following up your interests in classroom dialogue. A fuller version of questions to ask at each point can be found later in the T-SEDA pack (Section 3).

Reflective Cycle of Inquiry: focusing on educational dialogue



4) Analysing classroom talk: systematic observation and coding

To effectively understand what is happening in any talk situation, it helps to break down individual contributions and consider what functions they serve. A coding scheme can be an invaluable way of understanding real examples of classroom interactions and dialogue. This professional development pack has been developed from research on effectively coding classroom talk to look for evidence of 'dialogic moves' (see Section 2).

Systematic coding: what is it?

How do we know high quality classroom dialogue when we see it? How can we be sure our impressions are grounded in actual instances of productive forms of interaction?

A common way to tackle this is to categorise interaction systematically, or 'code' it, chunk by chunk, often coding each speaker's turn separately. This means looking at the functions of each contribution to the conversation made by teachers and students (e.g. inviting someone to offer an opinion; asking a question; or stating a point). Researchers may develop their own set of categories (scheme) for this analysis, or they may re-use or adapt one. Then they systematically apply the scheme across a lesson or particular episodes to see what features of the interaction are commonly occurring. Lessons might be coded live, from video or audio recordings, or from transcripts of those recordings (see guidance and examples in Sections 5 and 6).

Systematic coding: why use it?

Some benefits of coding:

- Coding shows up what the casual observer might not easily see, especially patterns emerging across lessons or episodes; for example who is participating more often and in more depth?
- Lots of lesson data can be handled and boiled down to show the frequencies of key characteristics of the dialogue
- Change (e.g. in teacher practice, student participation or learning) can be charted over time or student groups/lessons/classrooms can be compared using a consistent measure

Systematic coding: what will I need to be careful about?

Coding also has its limitations:

- Meanings and intentions can be ambiguous and categories may not be straightforward to apply
- Coding treats turns separately and out of context, so that the original talk becomes no longer visible; it ignores how codes work in combination and how one person's communications influence those following (e.g. how are questions and suggestions taken up in the dialogue? Are student contributions self-initiated or prompted by teachers and/or peers? Are some open-ended questions failing to stimulate students to give elaborated responses?
- Coding thus tells us little about the underlying dynamic of learning in that classroom and the instructional stance of a teacher – how dialogic or monologic it is
- Starting with certain categories can limit observation of other forms of interaction

What can we do about these limitations of coding? We can seek rigour and use complementary methods in order to strengthen the approach…

- For example, to capture a *supportive classroom climate for dialogue* - an ethos of mutual trust and respect - requires a much broader-grained measure than coding conversational turns. In our recent large-scale project we rated the student participation level across each whole lesson using a simple 3-point rating scale (see Section 2).

- We can explore how a dialogue progresses over time (during or across lessons) through reading it carefully and interpreting the interactions in light of the coding pattern emerging. Then we can write a narrative about these, taking account of different factors, such as:

    - how participants stimulate further contributions by others
    - significant features of the context including pedagogical objectives and strategies

5) Uses of the T-SEDA pack

This pack aims to provide guidance for teachers who wish to identify and foster more dialogic interactions in the whole class setting or between students working in groups. It is for primary (elementary) and secondary school practitioners to use in any subject area for professional development or as a research instrument. It may also be useful for students to monitor their own participation in dialogue, and it could be extended to apply to other dialogues in schools, such as teacher meetings. You can adapt the materials to the specific needs of your own setting and students.

You might use the pack in different ways, according to purpose and opportunity. Teachers, other adults (e.g. teaching assistants) and students could use T-SEDA as a tool for self-reflection and for observation of peers. Students' use of T-SEDA may in most cases be initiated and guided by the teacher, although the teacher may not be physically present on every occasion. Specific dialogue categories (see Section 2) can be chosen according to inquiry aims, interests and needs.

6) The importance of classroom dialogue – further insights from research

Here we expand briefly on some of the points summarised above. Key research references are provided at the end of the pack.

There is an emerging consensus among researchers about the forms of classroom interaction that are productive for student learning. In particular, talk has been highlighted as the main tool that teachers and students can use to *think togeth*er. Using words we can do things with others: we can invite, coordinate and question, as well as dismiss or hurt. Thus, not all forms of talk are equally powerful for learning, and by 'dialogue' we don't just mean any kind of talk. In dialogue, participants listen to each other, they contribute by sharing their ideas, justifying their contributions and *engaging with others' views*. In particular they *explore and evaluate different perspectives and reasons*. Purposeful questions and contributions are linked in *cumulative knowledge building* that can happen in a lesson or in series of interconnected lessons. Although verbal interactions are central, dialogue can be supported using visual or technology resources. Silence, physical movement, classroom routines and ethos can also be important aspects of dialogue, framing the spoken conversation that is the main focus of this pack.

Educational dialogue takes different forms with students of different ages, from the youngest to oldest, and it can be developed in different areas of learning. Some features of productive educational dialogue already appear in many classrooms and they can be promoted by

deliberate questioning, practising and continuously reflecting on how talk is being used to learn. But engaging in productive educational dialogue takes time and it might challenge participants, especially if they are not used to expressing their views at length or having them examined publicly. This is why it is helpful to establish *'ground rules'* for dialogue. Some ideas for important ground rules are indicated in the self-audit (page 8), but it is usually a good idea to discuss these with students and create a bespoke list of ground rules that is understood and owned by each class.

Following this conception of dialogue, the coding scheme in the T-SEDA pack presents a menu of 'talk moves', plus features of a more general classroom ethos that support productive dialogue. This pack highlights those elements of dialogue that have been shown in our large-scale research to be strongly related to student learning gains in English and mathematics and attitudes to school and self-as-learner. The data came from detailed analyses of 144 lessons by 72 teachers in 48 English primary schools (http://tinyurl.com/ESRCdialogue).

The main conclusion is that developing a supportive classroom ethos, with active participation ideally supported by talk rules in place, provides the foundation for dialogue to flourish; then, specific moves, especially those relating to elaborating and building on ideas, and questioning and challenging others' ideas, are linked to learning. Student elaboration seems to be particularly important.

Which talk moves are strongly associated with learning gains?

- **elaborating** and building on ideas
- **invitations to elaborate** and build on ideas
- **querying** – respectfully challenging and questioning others' views

Which are the most supportive elements of dialogue at the classroom level?

- active **student participation** – multiple students give extended contributions and engage with others' ideas
- explicit use of **talk rules** – ground rules supporting target dialogic practices, negotiated with students

These features of productive dialogue need to occur ***together*** to have a significant impact on learning.
Too much querying without the other supportive elements can even have a negative effect!

These findings describe the quality of both teacher and student talk, which go hand in hand. We know that if teachers invite students to elaborate more, for example, then students do so. **'Elaboration' – including invitations and contributions - is very strongly linked with positive attitudes to school and to self-as-learner too.**

In sum, dialogue promotes learning across the curriculum, the development of reasoning skills and communication skills, and more favourable attitudes to school and learning. Also, it enhances students' role in learning, boosting ownership and engagement. Our own study showed that very few teachers (less than 20%) introduced or referred to talk rules/ground rules for effective interaction and learning with others.

- When talk rules were evident, this was linked to more positive student attitudes to school.
- When use of talk rules was combined with a lot of elaboration, this was linked to significantly better results in mathematics.
- Where it was combined with querying, it enhanced reasoning skills.
- In small group work where students participate equitably and work well together on their own, their academic attainment in mathematics and English (spelling and grammar) improves.

These findings mostly concern dialogue in contexts where the teacher was present (interacting with class, group or individual).

We recognise that effective teaching contains a wide repertoire of different strategies that are used appropriately and dialogue is only one of those; not all classroom interactions will (nor should) be dialogic. However, research shows that dialogic teaching is rare in many classrooms, and there are opportunities across the curriculum to develop dialogic learning and teaching.

7) Keeping educational goals in mind: working with teachers to develop T-SEDA

The team that is developing T-SEDA includes practising teachers who are involved in trialling the materials in their schools. It is hoped that developing and using T-SEDA will support sharing of alternative ways of collecting evidence about the nature and outcomes of classroom dialogue. This may include its potential uses for many educational purposes, including the development of knowledge and understanding across the curriculum, the enhancement of classroom relationships and equity, and the assessment of, and for, student oracy and learning.
Teachers in several countries and working with different age groups have now tried out the pack and their feedback has helped to refine it. **Further feedback, classroom examples and suggestions from any teachers interested in trying out the materials are greatly welcomed (Contact us at: T-SEDA@educ.cam.ac.uk)**

An example from practice

T-SEDA is intended to help in bridging research and practice. For example, the self-audit tool (page 8) has been adapted from the 'dialogue table' on the next page, which concisely summarises one teacher's view about what happens in a dialogic classroom and what dialogic activity could lead to. It was authored by Diane Rawlins, one of our teacher co-researchers in Cambridge.*
The first and second columns in Diane's table are reflected in the self-audit tool given earlier. But what about the third column, omitted from the self-audit, that shows the goals – i.e. what dialogic activity could lead to. Does your own perspective on the goals of dialogue match Diane's?

Could you add your own third column to the self-audit tool (page 8), showing what your own educational purposes are?

- Is the ethos in your classroom supportive of dialogue? When does it approach the ideal?
- What are your wider long-term purposes?
- How will enhancing the dialogue in your classroom also help to achieve your wider goals?

Derived from work carried out as part of an Economic and Social Research Council Fellowship (grant no. RES063270081).

Diane's table: Supporting development of dialogue in the classroom		
In my classroom, we…	**You will see us…**	**So that we can…**
• respect, trust and listen to each other • ensure that everyone participates sometimes • take risks and experiment by trying out new teaching approaches • encourage children to be responsible for their own learning • use good subject knowledge and awareness of our children's needs to help us use children's contributions to advance the dialogue taking place • support children in a range of ways to enable them to share their views and ideas • invite others to elaborate and build on their own and others' ideas • value talk in our lessons and plan for it to take place • are willing to sometimes change our minds • continue a dialogue over time, from lesson to lesson	• sharing, comparing, discussing, commenting on and exploring different views and ideas • asking each other questions and querying the answers sometimes • showing that we consider other people's views • sometimes trying to reach a shared understanding by elaborating and building on what people say • giving feedback and responding in a helpful way; being a 'critical friend' • giving extended contributions, not just short ones • using what we already know to help us • reasoning and thinking aloud • telling each other what we have learnt when we have been thinking by ourselves • using classroom resources, including technology, in different ways to help us in our learning • saying why we agree or disagree with an idea	• create an inclusive learning environment • realise what we still need or want to learn and how we might like to do it • extend and refine what we already know • explain our reasoning clearly • help each other to understand things in a new way • come to agreement • express a range of views • build new knowledge together

Supporting the development of dialogue in my classroom		
In my classroom, we…	**You will see us….**	**So that we can,,,,**
•	•	•
•	•	•
•	•	•
•	•	•
•	•	•
•	•	•

So, how can the T-SEDA coding framework help me to evaluate the quality of dialogue in my classroom?

SECTION 2: Coding framework

The T-SEDA coding framework comprises two parts. The first one focuses on turn-by-turn analysis of dialogue, and the second one captures dialogic practices across a whole lesson or episode.

a. Coding categories for turn-by-turn analysis

The categories below can be used to analyse talk turns in order to understand the functions of each contribution to the dialogue. Sometimes, more than one code can occur within a turn or even a sentence. Guidance about how the framework can be used follows in the next sections of this resource. This framework has been adapted from the Cam-UNAM Scheme for Educational Dialogue Analysis (SEDA)[1] collaboratively developed and tested by two large research teams in Mexico and UK (as described by Hennessy et al. 2016).

Key dialogue categories		
CODING CATEGORIES	**CONTRIBUTIONS AND STRATEGIES**	**What do we hear?**
IEL – Invite elaboration *Invite elaboration, building on or clarifying own or others' ideas*	• invite to elaborate or build on own or others' ideas • invite to clarify a contribution • invite to agree/disagree, compare or evaluate others' ideas or views	**Possible Key Words to look for:** 'What?' 'Tell me', 'Can you rephrase this?' 'Do you think?' 'Do you agree?' **Examples:** What do you mean? Tell me more… Can anyone add to that? Can you give an example of what you said? Is your idea similar to Manuel's? What do you think about Maria's idea? Do you agree with what Chris just said?

[1] SEDA (©2015; pronounced "Sedda" as in Spanish) was developed by a research team from the University of Cambridge, UK, and the National Autonomous University of Mexico, led by Sara Hennessy and Sylvia Rojas-Drummond. The 3-year project was funded through the British Academy International Partnership and Mobility Scheme. The original SEDA has 33 coding categories organised in 8 clusters. It has been condensed and reformulated to create new forms of the scheme for different research purposes (e.g. the ESRC-funded classroom dialogue project: http://tinyurl.com/ESRCdialogue). The full original SEDA scheme and further information about the research are available at http://tinyurl.com/BAdialogue.

CODING CATEGORIES	CONTRIBUTIONS AND STRATEGIES	What do we hear?
EL – Elaborate ideas *Elaborate, build on or clarify own or others' ideas*	● build on own or another's ideas by adding something new ● clarify, elaborate, extend, reformulate own or another's ideas ● evaluate previous ideas	**Possible Key Words to look for:** 'it's also', 'that makes me think', 'I mean' **Examples:** Kate's idea made me think about why the character would do that. I've got an idea that no-one has mentioned yet… What I meant earlier was… My idea was similar to Jose, I wrote that flowers would make the best present
Q – Querying *Questioning, disagreeing with or challenging an idea*	● Stating full or partial disagreement ● Doubting an idea ● Challenging an idea ● Rejecting an idea ● Indicating that two or more ideas that have been expressed are in disagreement	**Possible Key Words to look for:** 'I disagree', 'No', 'But', 'Are you sure…?' **Examples:** I'm not sure it will float actually I don't think that's right, I think.... Are you sure these angles are the same? But then that wouldn't happen if… That's partially true, but not when… I don't agree with that at all It's not Victorian London though No, I think that other one

Some further categories to consider		
CODING CATEGORIES	**CONTRIBUTIONS AND STRATEGIES**	**What do we hear?**
IRE – Invite reasoning *Invite others to explain, justify, and/or use possibility thinking relating to their own or another's ideas*	● invite to explain, justify, draw on evidence, make analogies, make distinctions ● invite to predict, hypothesise ● invite to speculate, explore different possibilities	**Possible Key Words to look for:** 'Why?', 'How?, 'Do you think?' **Examples:** How did you arrive at that solution? What would/could/might happen if...? Can you imagine that…? Which objects do you think might float? Why do you think that was? (in relation to a statement/observation) Why do you think that would be? (in relation to a statement/observation) How do you know that? Chloe says x is 2. How do we know that she's correct? Who can tell me why they might agree with Joe?
R – Make reasoning explicit *Explain, justify and/or use possibility thinking relating to own or another's ideas*	● explain, justify, draw on evidence, make analogies, make distinctions ● predict, hypothesise ● speculate, explore different possibilities	**Possible Key Words to look for:** 'I think', 'because', 'so', 'therefore', 'thus,' 'in order to', 'if...then', 'not...unless', 'it's like...', 'imagine if...', 'would', 'could' or 'might' **Examples:** I think the wood will float but not the metal. The ice caps melting by 10% supports the global warming theory. If children don't have to go to school they wouldn't learn maths properly. If I chose the first alternative I would be safer, but if I choose the second one I could eventually have greater gains. I think the author might be referring to feelings when he writes about water.

CODING CATEGORIES	CONTRIBUTIONS AND STRATEGIES	What do we hear?
CA - Coordination of ideas and agreement *Contrast and synthesise ideas, express agreement and consensus*	● agree explicitly with an idea or a view ● evaluate different ideas by comparing/contrasting/critiquing them ● judge the value of an idea/artefact ● explicitly acknowledge a shift of position ● propose to resolve differences and/or agree a solution ● synthesise, generalise	**Possible Key Words to look for:** 'I agree', 'I changed my mind', 'to sum up…', 'So, we all think that…' **Examples:** I agree with X… because… Yes, Lucy is right because... Elaine came up with more evidence than Tim, she was more convincing. I think we agree that a suspension bridge would work best. I see what you mean, Option C is probably right, not B. They are both saying the same thing because…
RD – Reflect on dialogue or activity *Evaluate and reflect "metacognitively" on learning activity*	● talk about talk or processes of dialogue ● invite talk about talk or processes of dialogue ● reflect on purposes/ processes/ value/ outcome of learning activity ● invite to reflect on purposes/ processes/ value/ outcome of learning activity	**Possible Key Words to look for:** 'dialogue', 'talking', 'sharing', 'collaborating', 'groupwork', 'pairwork', 'task', 'activity' **Examples:** I like sharing ideas because it can give us new ideas for our writing. They (talking and listening) kind of go together, don't they? It (dialogue) works when everyone is talking about the right thing So, thinking about our ground rules for talking in the classroom... In your group can you think about what makes dialogue work? I can see you were listening to each other carefully. What changed your mind, and why? How did you feel about being in a 'note-taker' role in your group today?

CODING CATEGORIES	CONTRIBUTIONS AND STRATEGIES	What do we hear?
C – Connect *Make pathway of learning explicit by linking to contributions / knowledge / experiences beyond the immediate dialogue*	● refer back to earlier contributions or flag up forthcoming requests ● refer forward or back to relevant activity or artefacts refer to wider contexts beyond the classroom or to prior knowledge / experiences	**Possible Key Words to look for:** 'last lesson, 'earlier', 'reminds me of', 'next lesson' **Examples:** It's like when we did/learnt… Who remembers the experiment we did with keeping plants in the dark? At the end of the lesson I'm going to ask you to write down what you think happened and why. Who has visited the science museum and can tell us what they've seen? I know a lot about horse riding because I have my own horse. Do you think you might find similar creatures in the soil in your own garden? Have you seen anything on the news that refers to weather or climate?
G – Guide direction of dialogue or activity *Take responsibility for shaping activity or focusing the dialogue in a desired direction or use other scaffolding strategies to support dialogue or learning* **(This general category captures contributions that support the flow of dialogue and may enhance student participation)**	● encourage student-student dialogue ● offer thinking time ● propose possible courses of action or inquiry use strategies that respond to learners' levels of understanding such as: provide informative feedback, feed in / highlight ideas, focus attention on key concepts or task elements, stimulate wider/deeper thinking, introduce authoritative perspective, e.g. technical terms or facts to clarify confused thinking	**Possible Key Words to look for:** 'How about', 'focus', 'concentrate on', 'Let's try', 'no hurry' **Examples:** So, in answer to the question, what have you found out? Are you thinking about...? Don't worry, have a go... Let's try adding up instead! Take your time and let me know when you've thought of anything. Why don't you explain to Kelly what we are doing? In pairs can you discuss which of these sources you think is the most reliable account of the battle? What would Newton say? Try to make more eye contact so you can engage the audience more.

CODING CATEGORIES	CONTRIBUTIONS AND STRATEGIES	What do we hear?
E – Express or invite ideas *Offer or invite relevant contributions to initiate or further a dialogue* ***(ones not covered by other categories)***	• invite opinions, ideas, beliefs or examples without referring back or elaborating and building on prior contributions, typically by open, general questions, or by drawing more people into the exchange without explicitly inviting them to build/reason/coordinate/query • make a relevant contribution, including short responses to closed questions; plenary feedback; relevant ideas not explicitly linked to previous contributions	**Possible Key Words to look for:** 'What do you think about…?', 'Tell me', 'your thoughts', 'your opinion', 'your ideas' **Examples:** What do you think, Maria? What do you think is really important in this text? Can you identify some key words and underline them on the board? Are there any more ideas on that? How many four-legged animals can you name? What do you know about how electricity works? Let's brainstorm…

b. Dialogic practices across a whole lesson or episode

The following practices have been identified as particularly significant for student learning: talk rules and student participation.

Talk rules

Students often find it hard to talk and work well together. They need to be taught how to do this effectively. This means following a set of explicit ground rules and using the best ones for the task. Ground rules – or "talk rules" – are ideally constructed by a teacher and the class together rather than imposed. Here are some examples:

We listen to each other carefully and do not interrupt
We share all our idea
We ask each other 'What do you think?' and 'Why?'
We think about what we hear
We say as much as we can, taking turns and following on

A set of lesson plans for setting up talk rules/ground rules can be found at: https://thinkingtogether.educ.cam.ac.uk/resources/

Student participation

Talk rules support active student participation, which involves multiple students giving extended contributions and engaging with others' ideas.

This table describes levels of teacher direction and student involvement in key aspects of dialogic practices. This can be used as a rating scale for an episodes or whole lesson (see Section 6 for more details).

Dialogic Practice	Not evident	Teacher-led	Teacher-led with student involvement
Talk rules	No explicit focus on ground rules for dialogue or dialogic practices is apparent	The teacher introduces, models or reminds students of target dialogic practices, e.g. ground rules to be followed, inclusive turn taking.	Teacher and students or students themselves negotiate target dialogic practices, e.g. ground rules, perhaps along with reminders / modelling. It may also include students being given or taking responsibility for managing the dialogue, as well as students being involved in evaluating effectiveness of dialogic practices.
Student participation	Public exchanges in whole-class situation or group work consist in teacher questioning and succinct students' contributions or Students don't have opportunities to discuss their ideas publicly	Students express their ideas publicly at length in whole-class situation and group work, but **they don't engage** with each other's ideas	Multiple students express their ideas publicly at length in whole-class situation and group work **AND** In doing so, they **engage with each other's ideas,** for example by referring back to their contributions, challenging or elaborating on them (e.g. 'It's a bit like what Shootle said but….', 'Sam had such a great idea, look [demonstrates]'). This includes spontaneous or teacher-prompted participation.

Developing dialogic practice

&

Identifying aims, interests and inquiry focus

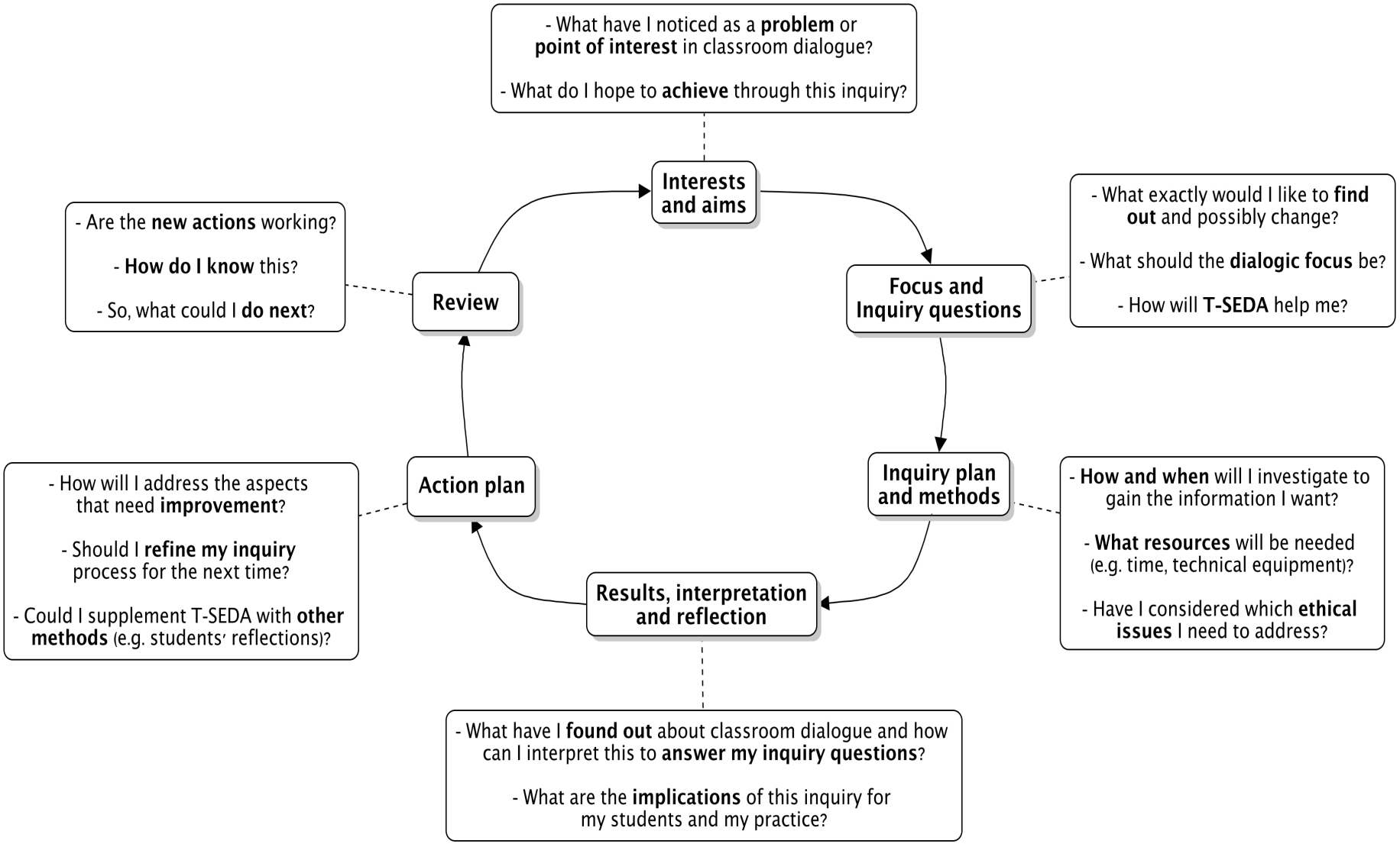
SECTION 3: Developing dialogic practice

The approaches outlined in the T-SEDA pack are grounded in the belief that **reflective inquiry** lies at the heart of teaching. This can involve individual self-reflection as well as collaborative professional development between teacher colleagues. Students are also part of this process and may be encouraged to discuss their own classroom communication and learning. The T-SEDA is particularly suited to situations when teachers have identified a particular interest in or concern about classroom talk and learning. Focusing 'inquiry questions' and conducting a short classroom investigation can help to target attention, sharpen awareness and build understanding of what is actually happening in the fast-paced classroom setting. Reflecting on observational evidence and further discussion with colleagues supports subsequent decision making about setting priorities and deciding whether and how to intervene. This inquiry process resembles school-based action research, in which knowledge and understanding are developed through iterative cycles of planning, classroom trialling, observation, evaluation, and reflection and modification.

The reflective cycle of inquiry on the next page is intended to represent how use of the T-SEDA materials may contribute to solving problems, building knowledge and generally following up interests in classroom dialogue:

A blank form of the reflective cycle is included in Appendix 1 for developing your own cycle. A completed reflective cycle can be an effective way of sharing investigation findings with colleagues.

Reflective Cycle of Inquiry: focusing on educational dialogue



SECTION 4: Identifying aims, interests and inquiry focus

Teachers, other adults (e.g. teaching assistants) and students themselves might use the T-SEDA pack in different ways, according to purpose and opportunity. Possibilities include

- videoing own lesson and analysing own teaching to audit current practice, or chart change over time (see Section 5)
- observing teacher colleagues and giving feedback (see table below and Section 3)
- analysing students' collaboration or reasoning skills and supporting their development (see table below and Section 3)
- self-assessment of teacher discussions (e.g. during 'lesson study' conversations) (see table below and Section 3)
- engaging in school-based enquiry and in wider research networks with school/university colleagues (see table below and Section 3)

Teachers who have worked with T-SEDA have inquired into different aspects of dialogue. Areas of interest include:

- students' reasoning in secondary school historical investigation;
- young learners' group roles in 'thinking together' activities;
- students' equitable participation in primary science groupwork;
- teachers' 'lesson study' discussions;
- teachers' peer lesson observations and professional development

One way to consider the range of possibilities can be seen in the table below  , with some examples of general inquiry questions that highlight the core elements of 'Elaborating and building on' and 'Querying and challenging' in the context of active participation and talk rules.

INQUIRY TYPE	SAMPLE PURPOSE FOR INQUIRY	SAMPLE FOCUS & INQUIRY QUESTIONS
Observation of other teachers	To see if talk rules to promote dialogue are in place To identify how students are supported to elaborate and build on ideas To see how the teacher helps students to engage productively in querying To see whether there is a supportive atmosphere for trialling and evaluating ideas	Are talk rules negotiated during the lesson? If not, are talk rules mentioned? **(Talk rules)** Do students and the teacher appear to observe talk rules or routines that benefit dialogue? **(Talk rules)** Is the teacher asking learners to evaluate, elaborate or comment on others' positions? **(IEL – Invite elaboration)** Do students feel comfortable and confident to express, query and challenge ideas? **(EL - Elaborate and Q - Querying)** Do they need a more supportive classroom ethos? Is the teacher drawing in more reticent students? **(Student participation)**
Observation of students	To investigate if students are elaborating and building on each other's ideas. To observe whether ideas are being challenged productively and respectfully by students To gauge levels of active student participation. To see if any students are marginalised or excluded	How are students reacting to invitations to build on each other's ideas? **(EL – Elaborate)** Do students invite others to build on ideas? **(IEL – Invite elaboration)** Do students respectfully challenge or question others' ideas? **(Q - Querying)** Do multiple students make contributions to dialogue? **(EL – Elaborate)** Do students initiate interactions and speak directly to each other without always addressing the teacher? **(Student Participation)** What are 'quiet students' and disengaged students actually doing during classroom or group discussion? **(Student Participation)**

INQUIRY TYPE	SAMPLE PURPOSE FOR INQUIRY	SAMPLE FOCUS & INQUIRY QUESTIONS
Teacher self-reflection & professional development	To self-assess how I am helping students to learn through dialogue To explore how elaborating and querying in dialogue can be supported To assess how talk rules are being taken up by the class and myself To identify barriers to dialogic learning and teaching	Do I actively build on learners' ideas? (EL) Do I explicitly encourage students to express disagreements or challenges? (Q) Do I draw in more reticent students? (Student Participation) In which subjects and activities do students query or challenge each other more easily? How could this be further developed? (Q) Which talk rules are being successfully implemented? Are there areas in which we need to improve? What strategies can I use to find a good balance between 'elaborating' and 'querying' in whole class dialogue?
Students' self reflection	For students to investigate how they can better engage with their classmates' ideas To assist students in reflecting on their participation in classroom dialogue	Are we listening and taking account of each other's ideas? (EL) Do we develop what others have said, instead of just waiting to say what *we* think? (EL) When we disagree with someone else's point of view, do we say it respectfully? (Q) If we don't disagree with each other publicly, why do we think this is happening? (Q) Are our talk rules working well for different subjects and activities? Are we all sticking to them?
Other	*e.g. multi-professional case conference or teacher team meeting / lesson study discussion...*	

Choosing your focus and inquiry questions

Most investigations will focus inquiry questions on specific elements of dialogue, depending on the particular interest or concern.

We suggest that inquiries that focus on classroom dialogue and learning could take account of the research results that point to the essential combination of these elements: Student Participation and Talk Rules, IEL (Invite Elaboration) and EL (Elaboration), and Q (Querying).

For maximum benefit to learning, all of these would be addressed. As a starting point, you might select one (or more) element(s) for systematic inquiry. For example:

- If there is a concern about equitable participation in groupwork, then it could be a priority to focus inquiry on encouraging quality student-student dialogue through introducing Talk Rules and supporting active Student Participation.
- If students seem to be confident to contribute in class but they rarely build on others' ideas, then an inquiry could target EL.
- The inquiry focus might call for including other coding categories. If students have been working on problem solving in mathematics then a focus on the categories Q together with R (Reasoning) could be developed.

It is likely, also, that the inquiry focus will change over time. This could happen because interest shifts from one classroom concern to another, or perhaps because learning objectives change. It could also occur because there is a sequenced logic to choosing the categories for different phases of inquiry. For instance, a teacher who is concerned about the quality of whole-class dialogue in plenary sessions might start with an inquiry question focused on the overall quality of Q (Querying) evident in the class discussion, before moving on to investigate levels of individual student participation in this context. Depending on the results, this could then be followed by close observation of how students elaborate and build on each other's ideas, how they challenge other views and how they connect their learning to wider contexts beyond the lesson.

Research Ethics

The T-SEDA professional learning pack is intended to support teachers' reflective inquiry, with the aim of enhancing classroom dialogue. As in any form of professional activity there are some general ethical considerations for using T-SEDA to investigate dialogue in school.

Many schools and other educational organisations produce comprehensive ethical guidelines. For instance, educational researchers in Britain are expected to abide by ethical guidelines issued by the British Educational Research Association (https://www.bera.ac.uk/wp-content/uploads/2014/02/BERA-Ethical-Guidelines-2011.pdf).

The following five principles of research ethics[2] have a long and important tradition in educational research, including school-based inquiries:

- Principle One: Minimising the risk of harm and maximising benefits
- Principle Two: Obtaining informed consent
- Principle Three: Protecting anonymity and confidentiality
- Principle Four: Avoiding deceptive practices
- Principle Five: Providing the right to withdraw

Minimising the risk of harm

School-based investigation can have unintended harmful consequences, such as:

- Physical harm or discomfort to participants (students and staff)
- Psychological distress and discomfort
- Social disadvantage
- Lack of privacy and anonymity

[2] See article by Jim Parsons, University of Alberta: http://www.teacherresearch.ca/blog/article/2015/05/30/264-an-introductionreview-of-action-research-and-its-ethical-practices

So the *risk of* harm should be minimised. To minimise these risks, researchers commonly find ways to follow Principles Two to Five above, with regard to informed consent, anonymity and confidentiality, avoiding deception and right to withdraw. These ethical concerns also need attention in using T-SEDA, although practical decisions about how to proceed depend on the circumstances. For instance, if T-SEDA is being used as part of ordinary class teaching then the need for students to sign a formal consent form is unlikely. The professional principles and responsibilities of good teaching can normally lead the way, but awareness of these ethical principles can help in responding to any tensions or dilemmas that may arise in using T-SEDA to improve learning and teaching in school. It is important to consider a range of classroom dynamics including issues of inclusion (e.g. for students identified as having special educational needs and disabilities), and other relevant social and cultural factors and practices.

Questions to consider for the ethical use of T-SEDA

As teachers, our primary responsibility is to our students. T-SEDA inquiry is intended to have a positive effect for students and staff, but it is important also to judge whether its use is negatively affecting particular lessons, meetings or other activities.

The following questions have been adapted from Zeni's (1998, 2001)[3] work and act as considerations for self-reflection. Although most do not call for specific action, they are points to consider and to talk through with trusted colleagues.

1. What individuals, groups, or communities do you plan to engage at this point in your T-SEDA study? What are the ages of those involved? Why have you made these decisions?

2. How might existing power relations and political influences affect the T-SEDA investigation? Whose views (e.g. students, parents, colleagues, senior leaders) could be influential or unnoticed in this respect?

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[3] **References**

Zeni, J. (1998) A guide to ethical issues and action research, *Educational Action Research, 6*(1), 9-19, DOI: 10.1080/09650799800200053

Zeni, J. (2001) A Guide to Ethical Decision Making for Insider Research (Epilogue), *Ethical Issues in Practitioner Research*, accessed from http://www.nwp.org/cs/public/print/resource/309

3. Might any negative or embarrassing data emerge from your inquiry? Might anyone be harmed personally? What precautions can you take to protect your students?

4. What are the possible benefits of your inquiry to students, teachers, other participants, or to the profession?

5. How will you explain your inquiry project to your students, to their parents, and to other teachers and administration in your school? What do your students know of this project? What are the risks to them or their families of their knowing (or not knowing) what you write or collect? Can you explain your decisions?

6. How will you protect the privacy and other personal rights of students, teachers, parents, and other participants? Will you use pseudonyms? When you share your findings, what might you do to ensure anonymity and confidentiality?

7. Where will you store and catalogue your data during and after the study? Who will have access to your data? What precautions should you take with your notes and data?

8. What data should you credit to others? Might any of your data be considered the property of others? If so, how can you arrange with colleagues or participants for credit or recognition?

Observation methods

and

Templates for observing and coding dialogue

SECTION 5: Observation methods including technical guidance for recording and transcribing

This section aims to help teachers select an observation method appropriate for their purposes and situation by highlighting the advantages and disadvantages of different methods. It also offers some technical guidance for audio/video recording.

1. Observation methods - potential advantages and disadvantages

The initial development of the T-SEDA materials involved a trial process which compared the following:

A. Live coding (i.e. simulated 'live' watching a video of classroom groupwork)

B. Audio-recording + selective transcribing (listening to the same video)

C. Video-recording + selective transcribing (watching and listening to the same video)

As a result, the following advantages and disadvantages were noted for each method:

LIVE CODING	AUDIO-RECORDING PLUS SELECTIVE TRANSCRIBING	VIDEO-RECORDING PLUS SELECTIVE TRANSCRIBING
Advantages		
• Visual representation – being able to see body language adds to our understanding of both dialogue and classroom relationships, as does interaction with digital or physical artefacts/resources	• Level of detail of transcript allows for more precise coding, considering clusters rely on language • Allows revisiting previous contributions to identify connections	• Level of detail of transcript allows for more precise coding, considering clusters rely on language • Allows revisiting previous contributions to identify connections

• In practical terms this method can be used more often than any other method. • It does not change the environment for the students so it can capture normal behaviour.	• Allows pausing and thus coder thinking time • Allows application of more codes (even all eight clusters) and repeated iterations if desired. • Facilitates identifying opportunities for teacher intervention.	• Allows pausing and thus coder thinking time • Re-enacting classroom conditions and thus giving a more accurate representation of classroom events. • Capturing nonverbal participation and physical domination.
Disadvantages		
• Speed of events might lead to inaccurate observations/coding. • Very demanding and tiring (listening carefully, timing, thinking and coding). • Only allows focusing on a maximum of two dialogue clusters as a more realistic option. This might miss other elements of the discussion. Likewise time sampling can by definition miss key events. • Not possible to re-play and reflect. Difficult to identify 'elaborating and building on' without written record; previous utterances cannot be accessed.	• More time consuming and thus not very practical as an iterative methodology. • Lack of visual observation means that teacher should identify speakers from voices. • Missing non-verbal participation or physical domination. • Not always possible to tell if participants are reading out. • Requires more expertise and practice to master and to avoid attention shifting from participation levels towards content and collective flow of ideas.	• It may take time for students and teachers to get used to being video-recorded, which means that initial recordings might not capture normal behaviour. • Technical equipment needed - often not available in schools. • More time consuming and thus not very practical as an iterative methodology.

2. Recording in the classroom

There are several possibilities for video and audio recording, depending on the inquiry focus and the classroom environment. The first principle is to use a system that is 'good enough' for the purpose, and not over-complicated. Existing equipment could be sufficient, including tablets and smartphones. Be warned, however, that recording equipment without an external microphone is likely not to capture good sound quality in a noisy environment so do test out your equipment beforehand.

For video recording, consider:

- tablet (with stand)
- phone (with stand)
- digital camera
- camcorder
- sports cameras
- Apps (it is worth trialling apps before investing, for instance Video Enhanced Observation (VEO) - free version allows 5 trial recordings)
- microphones (individual / table top)

For audio recording, consider:

- phone
- digital recorder/dictaphone
- tablet (some Apps offer facility to sync notes with audio recording timecode)
- Interactive whiteboards (or interactive display panels): see instructions for use of the Smartboard recorder facility in Appendix 2
- microphones (individual / table top)

Locating recording devices in the classroom

It is largely a matter of trial and error to find the best location that:

- gives adequate video and audio quality
- is near a power source and/or accessible to review battery life
- does not interfere with other classroom activities
- captures the events that are most relevant to the inquiry focus (whole class dialogue, peer talk, etc.)

Getting going

Classroom recording is more common than in previous years, but there is still a need to consider the following:

- a trialling period, before embarking on the main investigation
- acclimatisation for students and staff

Ethical considerations (see also Section 4 for general ethical principles)

It is essential to check whether students and staff have given consent to be recorded and, perhaps, for the recordings to be shared beyond the classroom. The following should be considered:

- Is there already a policy in place for video and audio recording? what exactly does it cover?
- Do individual students and staff have rights not to be recorded?
- Will any personal details need to be removed for future use of the video or audio?
- What procedures are in place for handling sensitive or otherwise difficult incidents or situations?
- How to ensure that recording does not interfere harmfully with learning and teaching?

3. Transcribing (if applicable)

The decision about whether or not to transcribe depends on the inquiry focus. Not all of the recorded material needs to be transcribed**.**

Transcription time: selecting or sampling what to transcribe according to the inquiry focus and the practicalities. For accuracy, you will need to slow down or rewind the recording. A detailed transcript from a lesson in a noisy environment could take up to 5 or 6 times the length of the recording!

If you are interested in meaning and function of language, for example analysing questioning or exploring how much students build on others' ideas, you can choose "intelligent verbatim". This includes the essence of the interaction, leaving out the unnecessaries (e.g. pauses, repetitions). This method inevitably involves a considerable degree of judgement and selection about what to include.

If your inquiry focus demands a very detailed and accurate record of exactly what was said, full verbatim would be more suitable. This includes more exact details of the actual spoken words and other sounds (e.g. laughter), pauses and other features of timing, sometimes with accompanying notes about tone of voice, gestures, and so on. This method still involves a degree of judgement and selection about what to include.

Any transcription, however detailed, can only be a representation of what actually occurred. Any recording can only be partial. Researchers often find it useful to make an initial transcription and then add to this, while listening again to the recording - often several times - in order to build up the best possible understanding of the conversation that occurred.

Tools for transcribing

There are some software tools that assist with transcribing, such as:

- Inqscribe - free software, useful to slow down recording; runs on Apple or Windows (https://www.inqscribe.com/); note that transcripts cannot be exported from the free version but they can be cut and pasted
- Easytranscript – free software, runs on Apple or Windows and allows the user to export files http://www.e-werkzeug.eu/index.php/en/products/easytranscript

You could also look for features that are built into the camera, computer or other recording device, such as the option to mark timecodes or 'bookmark' interesting sections that can be returned to later.

Transcribing notation: Researchers use some conventions to indicate significant nonverbal events and you may choose how much of this to include in your own records. On our ongoing project we use the following simple rules, adapted from Jefferson (1984).

Adapted Jefferson notation[4]

Symbol	Name	Use
(3+)	Long Pause	A pause of at least 3 seconds.
(text)	Parentheses	Speech which is unclear or in doubt in the transcript.
((italic text))	Italic + Double Parentheses	Annotation of non-verbal activity or indication of who the addressee is where this is otherwise unclear.

[4] Full Transcription Notation is described in G. Jefferson, "Transcription Notation," in J. Maxwell Atkinson and J. Heritage (eds), *Structures of Social Interaction*, New York: Cambridge University Press, 1984.

SECTION 6: Templates for observing and coding dialogue

CODING SCHEME FOR LIVE OBSERVATION

In this section we offer some tools for *looking systematically at dialogue* in both whole class and groupwork contexts, starting with the latter. First, **What is your focus and inquiry question?** It is important to identify this at the start (see examples in Section 4 and Section 7). Then, **How will you answer your question by developing your inquiry plan and methods?** T-SEDA offers some options using *structured observation techniques* such as checklists, grid and rating scales. These are most efficient when you already know what types of talk you are looking for (see categories in Section 2). Part A concentrates on how frequently different indicators of dialogue occur in a given episode. We add some rating scales to indicate participation levels over the whole episode too, i.e. how much participants are contributing to the interactions and activities of the class or group. These approaches can be used separately, depending on the purpose and feasibility (e.g. how much time is available). They can also be used in a combination of fine-grained and broader analysis, which can be particularly informative and powerful in showing how classroom dialogue works in practice. An editable version of this scheme can be found in Appendix 3.

PART A: Time-sampling coding for groupwork

This time-sampling approach is intended to be used by the teacher or another investigator for observing students working in groups. Groupwork is commonly seen to be one of the best opportunities for students to engage in productive classroom dialogue, allowing each the opportunity to participate. The ideal group size ranges from 3-6, depending on a number of factors, such as the age of the students, their experience in groupwork, and the nature of the group activity. Inquiry questions about groupwork may touch on a number of interrelated aspects of the students' dialogue, social relationships, and learning. It is almost inevitable that, whatever the initial inquiry focus, other elements will become relevant to drawing conclusions. For instance, should non-verbal communication be taken into account? What about the particular influences of technology use? In order to prepare for and handle this complexity, the recommendation is to focus at least one inquiry question centrally on just 1-2 clusters or codes. Also, use the 'Comments' space at the end to record notes about any other insightful observations or anything that seemed to influence the discussion. This will keep dialogue at the forefront of the inquiry, while still allowing other factors to be considered.

'Time sampling' is a common technique used by researchers to sample events at regular time intervals during an episode or whole lesson. It is based on the notion that recording and categorising every single communication or action is often too demanding, while sampling over time gives the researcher a roughly accurate picture, or at least one that is informative enough to make distinctions between individuals. Researchers might observe a group of learners simultaneously or instead categorise the communications of each individual participant in turn, depending on purpose and feasibility. Time sampling can be accompanied by written notes if desired. A time pattern for observing events is decided in advance and for complex behaviours such as dialogic communication whose form and purpose can change quickly, time intervals will be quite short so as to allow the researcher to listen carefully and categorise accurately. In these cases a "rest" period is commonly used when observing live as concentrating on closely observing and analysing interaction is very tiring and it is easy to miss things. If a video record is available, it can of course be replayed or slowed down so coding can take place without time pressures, as mentioned in the previous section of this resource.

The time-sampling example below uses the categories EL 'Elaborate and build on ideas' and 'Querying' throughout, but these can be changed according to need and interest; see the fuller scheme in Section 2 for more options.

Time-sampling template

Guidance notes:

- Write the names of the students of the group you are focusing on in the table below (you can add/delete columns)
- Each window is 1 minute: 40 seconds for close observation and simultaneous coding and 20 seconds for resting.
- For each window (minute), tick the box (√) if the identified student used Elaborating (EL) or Querying (Q) in his/her contributions to the dialogue. Note that in some circumstances tally coding for each relevant contribution may be useful and appropriate; this offers more detail about frequencies but is harder to record accurately.
- If during the 40 seconds, the teacher, teaching assistant or similar adult was present or interacted with students, tick the relevant box (√)
- Use the comments box below to add any further relevant information not captured by the time-sampling coding

Windows	**Teacher/TA present**	**Student 1:** ……		**Student 2:** ……		**Student 3:** ……		**Student 4:** ……	
		Q	**EL**	**Q**	**EL**	**Q**	**EL**	**Q**	**EL**
1									
2									
3									
4									
5									

Comments: Please use this space to record any other insightful observations or anything that seemed to influence the discussion.

PART B: Checklist for individual students (groupwork)

This checklist approach can be used at the end of a groupwork activity. It can serve as a summary of Part A, or if time-sampling is not possible, it can be completed independently. It aims to provide an indication of the overall participation of individual students in the given activity, focusing on the aspects of dialogue that are most relevant to the inquiry focus. This checklist can be repeated if the activity or the group changes, providing a record of different factors that may influence student participation in dialogue on different occasions. As in Part A (time-sampling) the idea is to consider the quality of students' participation in relation to selected categories (in this case EL and Q).

Checklists of this type cannot claim to provide exact measurements, and they are not intended to do this here. The intention is more to provide a manageable basis for noticing and recording potentially significant differences between individual student participation, including changes over time in different group activity contexts. These observations can then be the basis for discussion and with staff colleagues and students themselves, helping to identify where further action may be needed.

Guidance notes:

- Write the names of the students of the group you are focusing on (you can add/delete rows as appropriate)
- For each student, tick the box (√) if they have shown Elaborating (EL) or Querying (Q) in their overall contributions to the group discussion
- Use the Rating column to indicate the extent of participation of each student in the overall discussion. Use the following three-point scale: 1=Low participation, 2=Medium participation, 3=High participation. These levels should be judged in relation to the general participation levels in this activity, not the typical or expected participation of individual students as judged from previous experience.

Students' Names	Q	EL	Rating of overall participation
1)			
2)			
3)			

PART C: Group rating (groupwork)

As with Part B, this group rating can be used at the end of each groupwork activity (and repeated if the activity or the group changes). Its main purpose is to record judgements about the group as a whole, basing the ratings on the selected categories (in this case EL and Q). This group rating can be helpful for establishing the general nature of dialogue in a group activity. The quality of dialogue can then be monitored for the group as a whole. It also provides a context for judging individual student participation (e.g. if the whole group is not elaborating, that is, building well on each other's ideas then it is harder for one student to do this than in a group where 'Elaborating and building on' is well-established).

Guidance notes:

- Use a three-point rating scale for the frequency of each dialogue category within the conversation as a whole: 1 = low, 2 = medium, 3 = high
- Use the 'Comments' column to add any relevant information to the rating, such as whether the results are typical, or if they show progress

	Rating quantity (1-3)	Comments
Q		
EL		

PART D: Whole-class participation overview (rating scale)

This whole-class rating scale extends Part C to focus on whole-class talk. It is designed to support reflection on **student participation** in whole class interaction. This includes the frequency and length of contributions and the numbers of students involved in dialogue during particular types of whole-class activity, such as 'lesson introduction', 'whole class discussion', 'plenary', etc. (left-hand column). This overview can help to monitor the nature of dialogue during these whole-class activities, bearing in mind how the expectations for dialogue can vary even within a single lesson.

Guidance

- Select one or two coding categories that are central to your inquiry. The example below uses EL and Q. If you are interested in invitations, then IEL and Q may be a good combination. For other examples see Coding framework in Section 2.
- Add the types of activities taking place during the lesson in the first column (add/delete rows as appropriate). For each activity add your ratings in response to each question.
- Use the following rating scale: 5 = all the time/as many students as possible, 4 = most of the time/most of the possible students, 3 = some of the time/some of the possible students, 2 = occasionally/a few of the possible students, 1 = never/none of the students

Activity type	Category	How often are students doing this?	How many students are taking part in this?	Are these contributions extended rather than short?
1)	Elaborate (EL)			
	Querying (Q)			
2)	Elaborate (EL)			
	Querying (Q)			

Part E: Student participation and Talk rules rating scales

Once you are familiar with the methods above, you might like to use these 3-point scales to make assessments across a whole lesson or for each activity – in your own classroom or when observing a peer.

Dimension	0 Not evident	1 Teacher-led	2 Teacher-led with student involvement
Talk rules	No explicit focus on ground rules for dialogue or dialogic practices is apparent	The teacher introduces, models or reminds students of target dialogic practices, e.g. ground rules to be followed, inclusive turn taking.	Teacher and students or students themselves negotiate target dialogic practices, e.g. ground rules, perhaps along with reminders / modelling. It may also include students being given or taking responsibility for managing the dialogue, as well as students being involved in evaluating effectiveness of dialogic practices.
Student participation	Public exchanges in whole-class situation or group work consist in teacher questioning and succinct students' contributions or Students don't have opportunities to discuss their ideas publicly	Students express their ideas publicly at length in whole-class situation and group work, but **they don't engage** with each other's ideas	Multiple students express their ideas publicly at length in whole-class situation and group work **AND** In doing so, they **engage with each other's ideas,** for example by referring back to their contributions, challenging or elaborating on them (e.g. 'It's a bit like what Shootle said but….', 'Sam had such a great idea, look [demonstrates]'). This includes spontaneous or teacher-prompted participation.

Worked examples

SECTION 7: Worked examples

This section includes two worked examples of teachers' use of T-SEDA written by members of the development team. The first one is based on a small project in which elements of T-SEDA were used to investigate the extent to which student participation in small group dialogue could be seen as equitable. The second one, focusing on teacher and pupil participation in whole-class dialogue, is based on the Masters research project of a teacher who is part of the T-SEDA development team. Both examples include supporting notes (in the right-hand column) to show the key points and questions that underpinned each case 'story'. A blank form is included in Appendix 4 for developing your own worked examples. A concise worked example can also be a very effective way of sharing investigation findings with colleagues. These would also be very useful to add to the T-SEDA pack for others to read.

Case Study 1: Inquiring about equity in student participation in dialogue	**Points and questions**

Enquiry: Lily, a year 5 teacher, wanted to find out about children's participation in reasoning in her science lessons. She had previously established the ground rules for productive talk during groupwork, and she had gained a general impression that the children were responding well. She was, however, concerned that some individual children may be marginalised or excluded from the group discussions, while others may be talking a great deal without listening to other ideas. She therefore decided to find out whether the students participate equitably in the dialogue during science groupwork. She also wanted to see if there were any identifiable obstacles to the equitable participation, and any opportunities to intervene and enhance this. She decided to focus on just two aspects of dialogue in order to be realistic and manageable in her inquiry. She selected R (reasoning) because of its current relevance to her science learning objectives; and EL (elaborating and building on) because of her interest in seeing how the children responded to each other and took account of different ideas in their discussion.	• *Name of teacher, age group*
	• *General investigative purpose*
	• *Existing dialogic conditions, previous actions and general evaluation of the starting point*
	• *Specific concerns and investigative focus, and inquiry question(s)*
	• *Intended/hoped for outcomes*
	• *Focusing and managing the investigation*
	  ○ *Which aspects of dialogue and why?*
	  ○ *Practical issues*

Method: Lily decided to use time sampling, employing Part A of the T-SEDA observation scheme. She had some previous experience in systematic classroom observation, so she was confident about using time-sampling reasonably accurately and she felt that this rigorous approach would help her to notice significant interactions that she might otherwise miss. She also had some student teacher assistance in two forthcoming science lessons, so she felt able to devote some of her own time to detailed 'live' observation of two groups while her colleague took responsibility for the class. The lessons focused on the anatomy of the flower, with associated group tasks. For instance, one task involved the children working together to label the parts of a flower. They students dissected real flowers as well as working on the interactive whiteboard following a sequence of guided questioning.	● *Decision about observation approach (with reference to the T-SEDA tools* ● *Previous experience and confidence to proceed* ● *Specific goals* ● *Practical considerations* ● *Focus of lesson and student activity*
Lily identified two 10-minute slots when she could be available during the lesson and she prepared herself with a printed copy of the checklist and a timer on her phone. She sat close to the student group at a separate table. She adopted the timing suggested in Part A, i.e. observation 'windows' of 1 minute and 40 seconds for close observation and simultaneous coding, followed by 20 seconds for resting. For each window she ticked the box when the identified student used Reasoning (R) or Elaborating and building on (EL) in his/her contributions to the dialogue. She decided just to tick once in each window rather than tallying the number of contributions, since she felt that she this would be practically manageable and sufficient to provide an initial overview of each child's participation. When she had completed her time-sampling, she used Part B of the T-SEDA to rate each child's participation as 'high', 'medium' and 'low', judging this in relation to the general participation levels in this activity (i.e. not the typical or expected participation of individual students as judged from previous experience).	● *Decisions about when and how much observation time* ● *Technical tools and physical arrangements* ● *Observation and recording details (following or adapted from relevant T-SEDA tool)* ● *Reasons for observation and recording decisions* ● *Stages of investigation (with reference to T-SEDA tools in use)*

Findings: Lily's ratings showed clear differences between the children's participation in both lessons: One child was rated as consistently 'high' in (R) 'reasoning', but not (EL) 'elaborating', and one child was rated as consistently 'low' in both. Two other children were more ambiguous, with mixed ratings that differed between the two lessons. One of the children who received mixed ratings had contributed a lot to reasoning in one lesson, but did very little to build on others' ideas. In the next lesson this child then did much less reasoning and generally contributed less. On reflection Lily realised that this child's high level of reasoning in the first lesson occurred when the child was leading the written response on the IWB, while in the next lesson this child was watching others in this role. With regard to the child who was rated consistently low in both lessons, Lily was concerned to note on the time sample record that none of the others responded to any of his suggestions; they just seemed to talking over him and continuing their own conversation.	• *Broad findings in relation to inquiry question(s)* • *Sample observations relevant to the inquiry, particularly potentially calling for further investigation* • *Reflective comment drawing on teacher's wider knowledge of the children and classroom* • *Identification of potentially serious concerns not previously evident (learning; social; etc)*
Evaluation: Lily found this to be a manageable short inquiry that confirmed and extended her understanding of the children's participation in science groupwork. She felt that she had noticed aspects of the children's interactions and activity that she had missed before. On reflection she concluded that there was not equitable participation in dialogue when referring just to the actual amount of contributions from each child. She also noted, however, that the children did seem to share different elements of the task between them, so were they taking collective responsibility for 'dividing the labour' and completing the task as group? This led her to reflect on what she understood and expected of the children's participation in groupwork, particularly in terms of how individual contributions to talk, activity and social relations might vary over time.	• *Overall evaluation of findings and manageability* • *Specific points noticed* • *Reflective summary and conclusions relating to the inquiry question(s)* • *Wider critical reflections on classroom dialogue and learning*
Where Next? Lily decided that, having now tuned in to the question of equitable participation in groupwork, she would continue her investigation in two ways: (1) as a priority to observe the child who was consistently rated 'low' (using an open narrative style), and also to talk to him individually about his feelings about learning in the class; (2) to find further opportunities to observe groups	• *Identifying next steps in the investigation* • *Priorities (e.g. in relation to any serious concerns emerging) and general development*

systematically to develop her 'noticing' and ensure that she was not relying on her assumptions about the children. In order to do this she decided to just use Part B of the T-SEDA scheme, adapting the format to create a tally chart for the whole of each observation period. She felt this would serve her purposes sufficiently in taking her to the next stage of inquiry, and that she did not need to repeat the intensive time-sampling that she had started with. Her ultimate aim remained to identify any obstacles to the equitable participation of individuals and groups of children, and to find opportunities to intervene and enhance the children's inclusion in classroom dialogue and learning.	● *Potential use of other investigative tools (e.g. interviews)* ● *Further use of T-SEDA tools (including rationale for any adaptations)* ● *Ultimate aims in relation to educational values and priorities for the students* *NB. General emphasis throughout on teacher's ownership and decision making of the whole process*

Case study 2: **Inquiry into the level and nature of teacher and pupil participation in whole class dialogue**	**Details to include**
Enquiry: Lisa, a year 5 teacher, was teaching a single lesson on photosynthesis, and wanted to find out how much guiding she might do during an initial discussion, and how much the students would be able to express their ideas from prior learning. She decided to focus on G (guide direction of dialogue or activity) in relation to herself, and E (express or invite ideas) in relation to the students.	● *Teacher name (or pseudonym), year group* ● *What is the lesson subject and focus?* ● *What is the reason for the investigation?* ● *Is there any prior learning which is relevant?* ● *What will the dialogic focus be? (chosen codes)*
Method: Lisa decided to use part D (whole class overview) of the T-SEDA. Lisa did not have any other adults to call upon during the lesson, and wanted to conduct a whole class dialogue in which she would be involved, therefore observing and coding dialogue 'live' would not be possible. She decided to audio record the introductory discussion of the lesson so that she could listen to it later. This method would enable her to reflect on the dialogue after the lesson in order to identify occurrences of G and E. The nature of the discussion would be to elicit and draw upon the students' prior knowledge of photosynthesis and to guide their discussion to a fuller understanding of the processes involved in plants synthesising glucose.	● *How will the T-SEDA be used?* ● *Why will T-SEDA be used in this way?* ● *Will any equipment be used to aid the use of T-SEDA, and why?* ● *What is the nature of the dialogue to be coded?*
Findings: Lisa noticed when listening to the audio that she seemed to make more contributions during the discussion than the students did, so she decided to count how many contributions were made by herself and how many were made by the class. She found that during the discussion she made 95	● *What was noticed during the dialogue?* ● *Were any actions taken as a result*

contributions, whilst the students made 46 contributions. Having counted the total number of contributions made, Lisa decided to calculate the percentage incidence of G and E contributions made during the discussion and use these incidences to assess the level of contributions as defined by the T-SEDA. The percentage incidence of teacher's contributions coded as G was 54% of the total, a rating of 3, whilst the percentage incidence of students' contributions coded as E was 70% of the total, a rating of 4.	*of these observations?*
Evaluation: Lisa was surprised that the number of contributions she made (95) during the discussion was relatively high compared to the number made by the class (46) which may indicate that the students' prior knowledge of the subject of photosynthesis was less clear than she had anticipated. However, since 70% of those 46 contributions were coded as E, this indicates that the students did have ideas to express on the subject, even if they needed quite a lot of teacher guidance to structure those ideas and reach conclusions.	● *Where there any unexpected observations during the dialogue?* ● *What conclusions can be drawn from the observations about the nature of the dialogue?* ● *What conclusions can be drawn about the learning scenario?*
Next Steps: In light of the relatively high number of contributions made by herself during the discussion, Lisa reflected that when approaching a subject for the first time with the year group, even when they had met the subject in previous years, that it could be useful to present a refresher of their prior learning before asking them to hold a discussion and share their knowledge. She also wondered if whole class dialogue could be structured in such a way that her own input could be reduced, and so decided to investigate this with further inquiry.	● *What reflections can be made about teaching practice from this evaluation?* ● *What reflections can be made about children's participation in dialogue from this evaluation?* ● *What might be done differently in a similar situation in the future?*

References to research on dialogue

&

links to resources

SECTION 8: References to other research on dialogue and links to related resources.

Links to related research-informed resources for practitioners

The following resources were all produced by academics at the University of Cambridge and their collaborators:

Thinking Together – a novel programme produced by Lyn Dawes and Neil Mercer and colleagues to support the co-construction of talk rules and the use of 'exploratory talk' in which partners engage critically but constructively with each other's ideas. Proposals may be challenged and counter-challenged via argumentation. The programme had positive effects on primary children's logical problem solving, as well as in mathematics and science. Extensive resources available for teachers are listed at http://www.thinking-together.org.uk/

OER4Schools – an extensive set of open, multimedia professional learning resources for primary teachers in sub-Saharan Africa which contains units on whole class dialogue and groupwork, drawing on Thinking Together and a range of other relevant resources, and illustrated with video clips. www.oer4schools.org

A school-based *professional development workshop programme to promote dialogic teaching with interactive technologies*. Trials showed that (primary, middle and secondary) teachers developed their understandings of classroom dialogue and devised new approaches to support it.

> *A printed resource book* co-authored with participating teachers and including their own case stories of developing dialogic practice is also available:
> Hennessy, S., Warwick, P., Brown, L., Rawlins, D., & Neale, C. (Eds.). (2014). *Developing Interactive Teaching and Learning Using the Interactive Whiteboard: A Resource for Teachers.* Maidenhead: Open University Press.
>
> An *outline of face-to-face workshop activities* guiding teachers through the professional development process is downloadable at http://dialogueiwb.educ.cam.ac.uk/evaluate/.
>
> *Online resources including an open digital resource bank* of annotated screenshots, links to video clips of dialogic classroom practice and interactive whiteboard flipchart templates for creating activities, are at http://dialogueiwb.educ.cam.ac.uk/resources/.

Online resources also include teachers' own classroom materials developed to support dialogue in contexts using digital technology – in UK and Mexico. A set of downloadable resources for Primary/Middle/Secondary schools – including interactive whiteboard flip charts that can be re-used or modified – cover a range of subject areas and teaching aims. http://dialogueiwb.educ.cam.ac.uk/evaluate/teachersmaterials/.

Downloadable *video clips of dialogic teaching* in UK (primary, middle and secondary) classrooms deriving from several research projects are available at http://sms.cam.ac.uk/collection/1085164. Critique and discussion of other teachers' practices can offer a powerful stimulus for trying out new approaches oneself. (Prompts for such discussion are included with hyperlinks to clips in the co-authored book and the OER4Schools resource.)

If you use digital technology in your classroom, you may be interested in our technology-specific coding scheme (Tech-SEDA), which is currently under development. This offers concrete examples of how specialised technology tools can offer significant 'added value' in exploring ideas, supporting reasoning and drawing attention to particular features of a process.

There are many resources to support reflective teaching in general, including this comprehensive one produced by Andrew Pollard and colleagues: http://reflectiveteaching.co.uk/

References and further reading

Alexander, R. (2011). *Towards dialogic teaching: Rethinking classroom talk*. Cambridge: Dialogos. *[A very accessibly written booklet outlining the key principles of classroom dialogue]*

Dawes, L., Mercer, N., & Wegerif, R. (2003). *Thinking Together: A programme of activities for developing thinking skills at KS2.* Birmingham: Imaginative Minds Ltd. *[A book of practical classroom activities for developing the talk, reasoning and curriculum learning of children aged 8-11]*.

Hennessy, S., Mercer, N., & Warwick, P. (2011). A dialogic inquiry approach to working with teachers in developing classroom dialogue. Teachers College Record, 113(9), 1906–1959. *[A journal article describing the process and issues involved in academics working with teachers as co-researchers of dialogic practices]*

Hennessy, S., Rojas-Drummond, S., Higham, R., Márquez, A. M., Maine, F., Ríos, R. M., García-Carrión, R., Torreblanca, O., & Barrera, M. J. (2016). Developing a coding scheme for analysing classroom dialogue across educational contexts. *Learning, Culture and Social Interaction. 9,* 16-44. *[A journal article describing development of SEDA, the precursor coding scheme to T-SEDA, and the methodological issues encountered]*

Howe, C., & Abedin, M. (2013). Classroom dialogue: A systematic review across four decades of research. *Cambridge Journal of Education, 43*(3), 325-356. *[A journal article summarising the research on the impact of classroom dialogue]*

Littleton, K., & Howe, C. (Eds.). (2010). *Educational dialogues: Understanding and promoting productive interaction.* Abingdon, Oxon: Routledge. *[An edited book containing chapters by experts in the field on the importance of dialogue and its significance for learning and teaching]*

Littleton, K., & Mercer, N. (2013). *Interthinking: Putting talk to work.* Routledge. *[An accessibly written book describing how people think creatively and productively together through talk, and how to promote more effective talk in the classroom]*

Mercer, N., & Littleton, K. (2007). *Dialogue and the Development of Children's Thinking.* London: Routledge. *[A book proposing a new sociocultural account of the relationship between dialogue and children's intellectual development, relating research findings to real-life classrooms*]

Taber, K. (2013) *Classroom-based research and evidence-based practice: An introduction* (2nd ed.). London: Sage. *[A basic research methods textbook aimed at teachers in schools]*

Wilson, E. (2009/2013) *'Action research',* in Wilson, E. (Ed.) School-based research: A guide for education students. London: Sage. *[A basic research methods textbook aimed at teachers in schools]*

Acknowledgements

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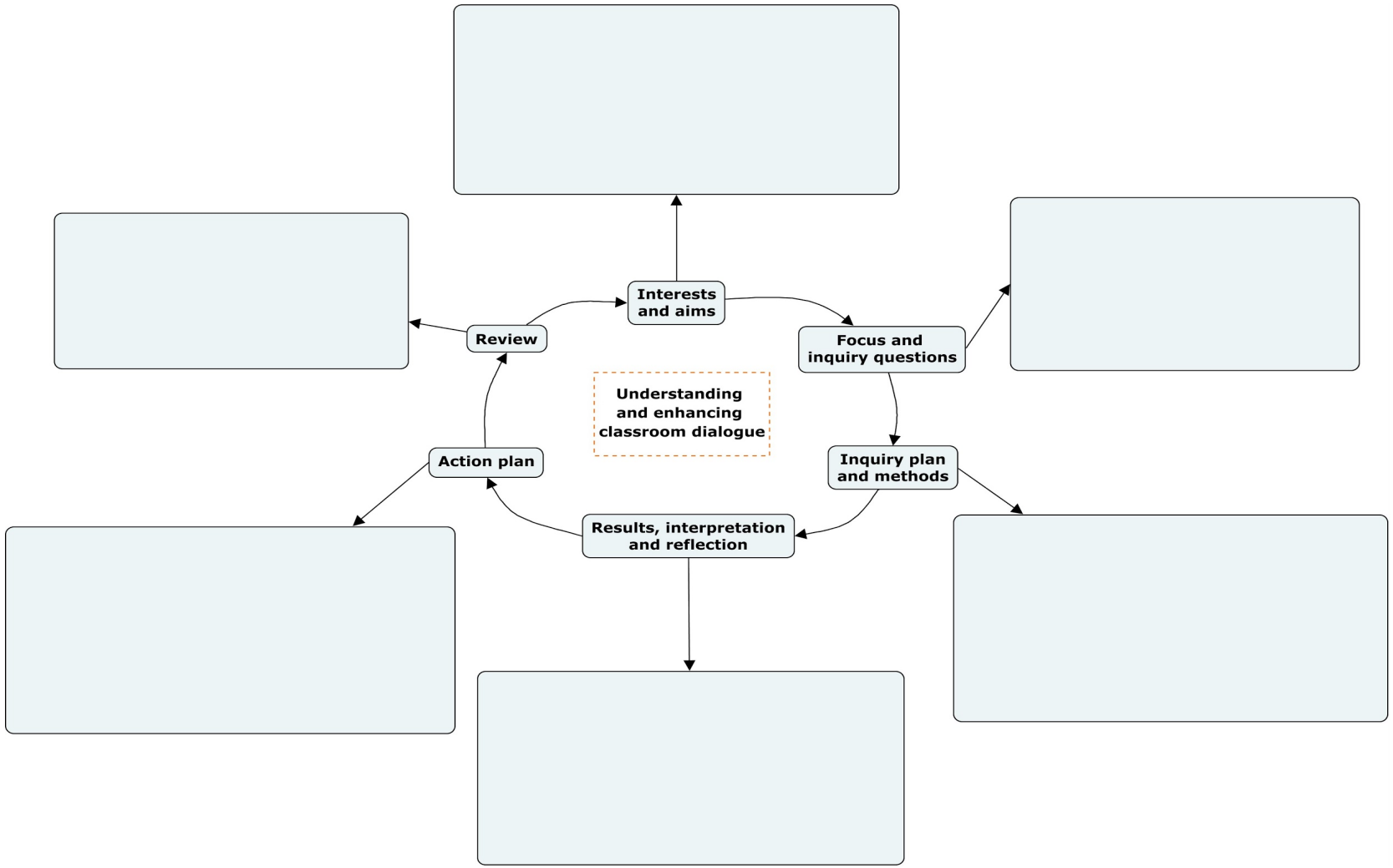
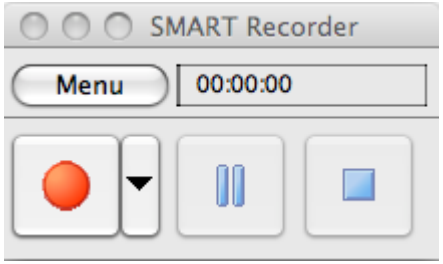
APPENDIX 1: Reflective cycle

This is a blank form of the Reflective Cycle that appears in Section 3. It can be used for developing your own cycle and ensuring that your investigation includes all relevant steps. To complete it, fill in the blank box for each step, describing your plans. Use the questions that appear in the original boxes (displayed in Section 3) to guide your decisions.



APPENDIX 2: Using the Smart Recorder on the Smartboard[5]



The Smart Recorder is an interactive whiteboard facility that can be used to audio record teacher narration and/or activity located at or near the board, or a whole class discussion, and it can also capture everything that happens on the screen. It is accessible through the Smart Notebook application, and can be accessed independently of Notebook as well (check your Applications folder, or use the Spotlight Tool to search for "Recorder"). This means that it can be used to record anything you do on your computer. Once complete, you have an independent movie file that can be embedded in your class wiki or blog, or . . . yes, even a Notebook file. You can even upload your movie to YouTube or Teacher Tube, or any of the other video sites, so it is available for your students to view again and again if necessary. I really love having my students use this recorder to make movies showing how they solve math problems, for example. Not only do I get to watch what they do, I can hear their explanation, and save the video as an artifact for their portfolio, or for a parent conference.

[5] Adapted from a document authored by Megan Bowe, Teacher at Norwich High School for Girls, Norwich, UK

APPENDIX 3: Coding Scheme for live observation

Teacher name:	**Subject:**
Date:	**Topic:**
Year group/Class:	**Teacher role in group** *(circle one):* Observing/coding

What is your question? It is important to first identify your focus (see examples under Inquiry Focus).

***The examples below use the categories Querying (Q) and Elaborating and building on (EL), but these can be replaced with any other categories selected in relation to the inquiry focus.

PART A: Time-sampling coding for groupwork

- Write the names of the students of the group you are focusing on in the table below (you can add/delete columns)
- Each window is 1 minute: 40 seconds for close observation and simultaneous coding and 20 seconds for resting.
- For each window (minute), tick the box (√) if the identified student used Querying (Q) or Elaborating and building on (EL) (or your selected categories) in his/her contributions to the dialogue. Note that in some circumstances tally coding for each relevant contribution may be useful and appropriate; this offers more detail about frequencies but is harder to record accurately.
- If during the 40 seconds, the teacher, teaching assistant or similar adult was present or interacted with students, tick the relevant box (√)
- Use the comments box below to add any further relevant information not captured by the time-sampling coding

Windows	Teacher/ TA present	Student 1: …….		Student 2: …….		Student 3: …….		Student 4: …….	
		Q	EL	Q	EL	Q	EL	Q	EL
1									
2									
3									
4									
5									
6									
7									

Comments: Please use this space to record any other insightful observations or anything that seemed to influence the discussion (e.g. strong initiative, facilitation for another speaker to join in, ignoring contributions, talking over contributions)

PART B: Checklist for individual students (groupwork)

- Write the names of the students of the group you are focusing on (you can add/delete rows as appropriate)
- For each student, tick the box (√) if they have shown Querying (Q) or Elaborating and building on (EL) (or your selected categories) in their overall contributions to the group discussion
- Use the Rating column to indicate the extent of participation of each student in the overall discussion. Use the following three-point scale: 1 = Low participation, 2 = Medium participation, 3 = High participation. These levels should be judged in relation to the general participation levels in this activity, not the typical or expected participation of individual students as judged from previous experience.

Students' Names	Q	EL	Rating of overall participation
1)			
2)			
3)			

PART C: Group rating (groupwork)

- Use a three-point rating scale for the frequency of each dialogue category within the conversation as a whole: 1 = low, 2 = medium, 3 = high
- Use the 'Comments' column to add any relevant information to the rating, such as whether the results are typical, or if they show progress

	Rating quantity (1-3)	Comments
Q		
EL		

PART D: Whole-class overview (rating scale)

Guidance

- Select one or two coding categories that are central to your inquiry. The example below uses EL and Q. If you are interested in invitations, then IEL and Q may be a good combination. For other examples see Coding framework in Section 2.
- Add the types of activities taking place during the lesson in the first column (add/delete rows as appropriate). For each activity add your ratings in response to each question.
- Use the following rating scale: 5 = all the time/as many students as possible, 4 = most of the time/most of the possible students, 3 = some of the time/some of the possible students, 2 = occasionally/a few of the possible students, 1 = never/none of the students

Activity type	Category	How often are students doing this?	How many students are taking part in this?	Are these contributions extended rather than short?
1)	Elaborate (EL)			
	Querying (Q)			
2)	Elaborate (EL)			
	Querying (Q)			
3)	Elaborate (EL)			
	Querying (Q)			

APPENDIX 4: Worked example

Case study X: Title	Key points and questions
Enquiry:	● ● ●
Method:	● ● ●
Findings:	● ● ●
Evaluation:	● ● ●
Next Steps:	● ● ●