



Exploring teaching and learning in real and virtual worlds

Dialogic teaching: Language and thinking

Narration

Neil Mercer is Professor of Education at the University of Cambridge. He has been closely involved in the *Thinking together* and *Dialogic teaching in the Science classroom* research projects which explore the relationship between language and thinking. He starts by telling us how he became interested in this area of research

Neil Mercer

I became interested in language and thinking in educational settings really by starting to work at the Open University where I became involved in the creation of in service courses for teachers, so having had a sort of theoretical interest in language and thinking I developed a quite strong practical interest in how teachers could help children develop their language and thinking skills.

There has been quite a bit of research over the years that's suggested that the early language experience that children have has quite a profound effect on their subsequent learning and cognitive development, but that research wasn't very kind of conclusive, it was indicative, some of it was sociological, some of it was psychological, some of it linguistic, there were a lot of ideas around and it sounded potentially very important, but a lot of unanswered questions as well, I felt it was well worth trying to take a sort of applied research perspective on how children develop their language and thinking throughout the school years and what role the teachers particularly play in helping that kind of development.

My research has been strongly influenced by the work of Lev Vygotsky, who was a Russian psychologist from the early part of the 20th century, and he made a very strong case for the importance of language in the development of children's thinking. Now this was part of a bigger kind of picture that he was developing, strongly influenced by Marxism, which was that people's whole development is very closely tied up with their use of tools this notion of tools had up to that point been used in rather more obvious sense of tools for working on the material world, but what Vygotsky did was take this idea of tools as a metaphor really and he suggested that language itself is a tool because with language we actually do change the world, we get together, we think about it, we decide what to do and we act on the world as a result of how we've talked and thought communally about it. So it became clear from his work, which only really became available to people in the West in the late part of the 20th century, that this tool of language was something that had a lot of potential that perhaps people weren't always recognising, particularly in educational settings.

Language, spoken language is one of the main tools of a teacher's trade and like any tool it can be used well or badly. One of the things teachers try and do with language is help students make sense of what they're learning, and what we've found, and other researchers have also found, is that teachers vary quite a bit in the extent to which they help students see why they're learning what they're learning, where it's coming from and where it's going to, and there's quite a lot of evidence to suggest that making that kind of thing explicit really does help. So one of the under-recognised skills of a very good teacher is they help children see the wood for the trees, they help them see where this road of learning's going, and why they're going this particular route on it, what this activity's meant to give you that will help you do the next one, how this bit of knowledge relates to that I think if we want to improve the quality of teaching in classrooms, I think people who are learning to be teachers should be offering this view of learning as a journey, and that they are the guide on the journey to the student's learning, in which the students are active participants the teacher can show them where the route ahead lies and why that's the case.

It's very important that the teacher makes the journey clear, but that journey in itself will involve a sensitive consideration of when certain content is made available to students. It obviously involves, ideas like, you know, scaffolding where you can be considering what kind of support they need at this point so that they'll be able to carry out a similar activity without that support later, it's a very fine balance of judgement between setting tasks, of choosing content, providing a lot of support and then not over-supporting when the learner is being expected to kind of stand on their own two feet.

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We asked Neil to tell us more about the Thinking Together project.

Neil Mercer

The main characteristics of the *Thinking Together* approach are to make the use of language in the classroom explicit for both the teacher and the children. We take language for granted so much it's something we just kind of use, especially in the form of speech, it happens and then it fades away and teachers tend to assume that children come to school speaking language and that's something that they either can do, for better or worse, but they don't necessarily think it's something that they have to work with closely with the children. So children often get asked by teachers to go and talk together and work in groups. Now that makes the assumption that they all know how to do it. Many of those children may not have much experience of working and talking together with other people perhaps outside, you know, the classroom and they're expected to kind of just go away and do this. What we've done in *Thinking Together* is say, well, let's, let's get everybody to look at this, this tool of language in an explicit way and say how do you use language to think with somebody else and get something done? If you have a good discussion, what does a good discussion look like? How is it different from a bad discussion, what do you have to do, what do people have to do to actually work well together and talk effectively together? And so we ask the teacher to raise this whole idea with the children and then to work towards establishing a new basis on which they can all work and talk together effectively.

The kind of language experience children have outside school will give them lots of opportunities to learn ways of communicating and all children will do so. However they won't necessarily all have the same range of experiences of using language there may be some ways of using language which are potentially very useful which some children have more or less opportunity to learn. They also gather from their experience outside school that there are certain sort of implicit ways that one acts in any particular situation, that's how social life happens at all. I know this is an interview so I act in a certain sort of way because I know there are sort of ground rules for interviews which mean that I should do most of the talking, and I should probably try and talk fluently without hesitation and all that kind of stuff. Children, likewise, will be in school bringing into the classroom some notion of what ground rules operate there. Some of those will be determined by the kind of conversations they have with their parents at home; some of them will be determined by how their teachers have operated with them in conversations already in the classroom. When they're asked to talk together in groups in school they must think well, what kind of situation is this, what am I meant to do here? They may well bring very different notions of how you operate in a group. They may think well, what I'm meant to do in this group is stick to my own opinion and hang on to it, whatever anybody else says. They may think in this group I shouldn't really try and say too much because the other people are much cleverer than me and they won't want to know what I say. They may have other ideas about what a group really amounts to when you work and talk together. So what we've found is that groups often don't work very well because children are bringing in to that situation lots of different ideas about how they should work in the group they don't have a shared set of ground rules. So what we suggest the teacher does is actually bring this out into the open for the children and say how can we best work together in groups and, if so, what would be the kind of rules we should follow, they can then work with the children towards establishing a set of ground rules which the teacher directs to some extent, which are more like those which would determine the kind of language that we call the *Exploratory Talk*.

The kind of talk that you want to have in a good discussion, whether you're a child or an adult, is the kind of talk in which everybody is genuinely sharing what they know and genuinely

working towards a common purpose and in which everybody's ideas are respected, in which you won't be made to look stupid by other people by trying out something new, in which you're trying to seek some agreement, and that in which if you don't really understand what somebody means you say I don't think I really understand what you mean, can you explain it again, or do you mean this? So that's the kind of talk that we all want to happen and it's the kind of talk that teachers want to happen in discussion groups in classroom, and it's probably the kind of talk that, say, managers want to happen in working groups in work settings. And so that kind of talk we thought deserved a name and we found that Douglas Barnes, who is a very eminent classroom language researcher, had already started thinking about these kind of ideas some time earlier in the '60's and '70's and he came up with this name *Exploratory Talk* for a kind of talk that isn't just presentational, like the talk I'm doing now where I'm trying to simply present to you what my ideas are, but where people are trying to test out new ideas of making sense of the world and they're using language to do that we decided we'd take up this label, of Exploratory Talk to try to describe this very effective kind of discussion that people ideally will have when they're trying to solve problems together.

We've found that *Thinking Together* works best probably in groups of three children, although I should say this is mainly a finding from Key Stage 2 from children aged 10 or 11. We've found that the groups tend to work best with groups of three because if you've got four it's a lot easier for one person to get left out on the side or the group to sort of break down into two two's who kind of work, you know, semi-independently, while when you've only got two children there may not be enough variety of ideas to stimulate the kind of active consideration and challenging of ideas that we would hope to see in exploratory talk. If you've got three for that age group, and I wouldn't generalise too much across all the age groups, for that age group you've got enough diversity there to get enough ideas happening and yet you've got a situation that really seems to set up the right kind of dynamic, and we just found in practice that they tend to work best.

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So what's the teacher's role in a Thinking Together classroom?

Neil Mercer

In a *Thinking Together* classroom the teacher has to see their role in terms of two main characteristics. One is to be a model for the kind of language they want the child to learn to use, for *Exploratory Talk* if you like. Children may not have a good model for a reasoned discussion anywhere else in their lives, they may not hear many reasoned discussions anywhere else, they need to hear how people do them so I think the teacher has to be a model for *Exploratory Talk*. And the other thing the teacher has to be is a guide for the child in their own exploration of how they use language so the teacher has to set up suitable activities so the child can try out talking and thinking with other people, they have to ask the sort of questions that'll make the child think about they how they use language or how they solve problems, and so I think it's these two aspects that are the most important really. The teacher has to be what Robin Alexander calls a dialogic teacher where they're aware of the importance of dialogue and in which they're both allowing it and yet guiding it at the same time.

If a teacher starts a *Thinking Together* approach with children, and they've got to continue it for a while to really get the benefits, I am confident that they will find that children are able to work better in groups, they will work collaboratively better. There are other ways of helping children work better too but this, this is one way that works. I also think the teacher will find that the children are more aware of how they use language it relates to their study of the English curriculum of speaking and listening, according to the results we've gained, they will also gain individually in a way that Vygotsky would have predicted, that is, from taking part in reasoned discussions in the classroom they will internalise a reasoned discussion for themselves and if you think about it, that's what educated people do you kind of have an argument with yourself and that's what you want children to have, that's the essence of rational thinking, and we've been able to show that by taking part in the reasoned discussions in the classroom the children then internalise this and have reasoned discussions with themselves as a result they do better in tests of reasoning, they do better at solving problems in science and maths on their own and, and, and there's evidence from other people's

research, such as Richard Anderson's in the United States, that their reading comprehension improves as well. We've found, and other people have found too that, that overall their academic attainment is improved as a result of this kind of systematic approach to developing children's use of the tool of language.

When we were trying to test out the value of encouraging children to use more *Exploratory Talk* in school it seemed important to not just see if they talked better and seemed to learn better, seemed to do better in studying the curriculum, it seemed important that we compared what happened with them with children going about life in schools in the ordinary way. This was partly because we wanted to come up with some nice strong quantitative results-so we wanted to do that, but it was also by comparing ordinary teachers going about life with children in a primary class and the same kind of perfectly ordinary teachers taking this rather different *Thinking Together* approach we thought that would speak to teachers as well because it was saying these aren't really weird, strange people doing this, they're just people like you, so in that sense we could, show very clearly that in ordinary real world circumstances it made a difference.

The *Thinking Together* approach has been tested quite systematically now. Initially it was tested in the UK. We tested it first of all in Key Stage 2 primary schools and that involved I suppose in a number of related projects about five hundred children. Since then we've tested it in a much smaller project with the Year 1 children, Year 1 and Year 2, and also with Key Stage 3 secondary children. Other than that it's also been test most systematically, apart from the UK, in Mexico where it was again used with primary and secondary children, and fortunately the results, you know, were confirmatory there. There is currently a Japanese project which is looking at with both primary and secondary children. There is also currently a Dutch project which is using it with immigrant children in Holland, and so there are a number of different kind of settings in which it's been used in slightly different ways. Fortunately so far these have provided essentially confirmation of the approach though they also suggest that for it to be most effective you've got to adapt it to local circumstances and, you know, to local education systems.

What we think as the kind of normal ways of behaving in a reasoned discussion here might be slightly different in Japan or Mexico. It's considered much ruder to challenge somebody's view in both Mexico and Japan than it is here, while in Holland people are very direct and are quite ready and accepting of people, you know, saying I think that's rubbish, while you would never do that in some of these other countries. It has been tested in those different settings and children did seem to benefit from having developed their use of language as a tool for learning, both collectively and alone.

One of the concepts that's been very useful to us, and has only really emerged since we began the *Thinking Together* research, is that of dialogic teaching and this really comes out mainly of the work of Robin Alexander, one of my colleagues here at Cambridge, and also other people like Phil Scott at Leeds who is a science educator what they've both being trying to suggest is that effective pedagogies are those which take dialogue as the essential medium in which pedagogy occurs so it's not just the content of materials, the structure of materials, the nature of them, the tasks as such, linking all these things is an effective use of dialogue but obviously that's very compatible with what we were doing already, but it highlighted-the special relationship between the teacher as the guide for the student's learning, and the teacher as the model for the child's own use of language, because I think the dialogic teacher is somebody who is both using dialogue in a very self aware reflective way to guide students' learning and help them develop understanding but is also equally aware that if their work is successful the children themselves become effective users of dialogue. So a dialogic teacher would be able to ask certain questions of a class that they'd been working with for a while that would sound superficially like the same questions as a teacher who wasn't dialogic but they would raise very different ideas in the children's heads in a conventional classroom where the teacher hadn't really been in a dialogic kind of mode the children will probably think right, well I've got to think of the right answer here, the teacher always wants me to say the right answer so I'll say the briefest right answer I can think of. In a more dialogic classroom the child might recognise in that question a bit of an unusual request from the teacher for some exploratory thinking-well they want to know what I might

be wondering, and so the same superficial question in a dialogic classroom could have a very different cognitive consequence and different learning consequence I think that's the whole essence, it's a new relationship between the, the teacher and the student predicated on both using dialogue in different ways. And Phil Scott, for example, distinguishes between authoritative discourse and more dialogic discourse in the classroom and doesn't say that's one right, the other's wrong, that's not at all what he means, he means that authoritative discourse is when the teacher is self consciously acting in the role of expert, is explaining ideas to someone who was there to find out, as I'm doing to you now, and yet he's doing so knowing that at some other point in the sequence of events in the classroom they will want to stop being that authoritative expert and they'll want to become a listening person who hears other people's ideas and is perhaps learning with the children about something, or is in fact trying to learn what the children think, a good teacher again balances these two kinds of dialogue in a strategic way, the authoritative and the more dialogic forms of interaction.

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So where does the idea of dialogic teaching come from?

Neil Mercer

The origins of dialogic teaching probably lie mainly in the work of Lev Vygotsky, because he was the one who really made us aware of the importance of dialogue in the process of cognitive development and learning. His work in that sense contrasted with Piaget's, the other big influence on understanding of child development, who didn't really give such prominence to dialogue though he did recognise it. Another strong influence is the work of Jerome Bruner, the American developmental psychologist as well, who himself was influenced by Vygotsky and who very strongly illustrated in his work the important role that adults and other peers can take in providing what he called a vicarious consciousness for the developing mind. So that before we can understand something ourselves you've got, hopefully, a parent or other adult who can help you understand it, who through dialogue can help you make sense of something that's a bit beyond where you're at now, and Vygotsky's concept for this was the zone of proximal development this idea that with this extra help, this vicarious consciousness you could kind of move into this zone which meant you were a bit further than you'd have got on your own. There are other influences such as another Russian literary analyst, Bakhtin, who also suggested that we should always be aware that in any dialogue, he was mainly talking about dialogues in texts that you only really make sense of words by knowing where they've come from and where their origins lie within that dialogue. He said that we don't learn words from dictionaries, we take them from other people's mouths and when we do they have, if you like, the flavour of those previous speakers, and so through that we start to see that the way children hear language used in the classroom, the context in which it's used, the new words, the technical words they're hearing, the new ways to hear books being talked about, the natural world being talked about, these all start to shape the way they think and the way they're able to talk about those things themselves. The other origins really are other influential people in classroom research in Britain and elsewhere, people such as Douglas Barnes whose very seminal work in classrooms in English schools in the 1960's and '70's was very insightful and new in the sense it revealed the dynamics of teaching and learning going on in a way that had sort of been invisible before. And I think that those kind of influences have really shaped this notion of dialogue teaching, so it's a mixture really I think of psychological theory and educational, if you like, pedagogic kind of ideas. Dialogue is something which is shaped by cultural and social factors, and that if we want to understand how it operates in any particular classrooms any particular time we've got to look at the institutional and other cultural settings that mean this is why education's being done like this now, and do we like it like this now?

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Why did Neil and his colleagues decide on science as a fruitful area for a research project into the effectiveness of dialogic teaching?

Neil Mercer

The dialogic teaching in a science classroom which I carried out with Phil Scott at Leeds, Lyn Dawes who's at Northampton, and Judith Kleine-Staarman and Jaume Ametller, who were the two researchers on the project, was really motivated by a feeling that of all the areas of

education science was probably one where children had to make the biggest jump between their everyday ways of making sense of the world and the ways that that subject expected them to make sense of the world, And because of our sort of orientation within a socio-cultural kind of frame with a relationship between language and thinking it's sort of obvious then that those different ways of thinking are associated with different ways of talking and writing about these things, so we really wanted to see how teachers in a science classroom were using dialogue to help children move between their everyday conceptions of phenomena and scientific ways, it wasn't an interventional project, it was an observational project. We wanted to see what teachers who self consciously said well, I'm trying to use dialogue effectively in science classrooms, what they actually did and we could see some examples of good practice and perhaps not good practice, and to see what extent science education was moving into a more dialogic kind of era so we looked at primary and secondary classrooms in a couple of different parts of England to try and sample this kind of dialogic teaching in science classrooms.

Dialogic teaching isn't that something that applies to any one particular subject it applies to any subject. In our own work in England we've related it partly to citizenship education, people talking about moral issues and things like that, so I don't think it's got any special subject link, but the way you use it is probably different in different subjects. I think one of the aims of dialogic teaching in science, for example, and maths, would be very much to enable children to become fluent speakers of science, and so I think dialogic teaching in science education has got this special aim that it wants to enable children to become speakers of science so they feel easy with the vocabulary, with using the rational and organisational sort of structures of scientific language.

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As Neil explains, teachers were closely involved in the project right from the start.

Neil Mercer

We always try and work very closely with teachers on the projects, I mean our view is that we do research with teachers, not on teachers, and that means really trying to ensure that teachers are fully involved from the beginning in seeing what we're trying to achieve from the project. We usually try and recruit teachers who have some intrinsic interest in what we're trying to do. Normally that means trying to get some commitment from them to spend some time with us getting up to speed on the aspects of using dialogue in the classroom that we think are important and which we want them to use in their work some of them may well already be using dialogue in the ways we want but not necessarily be aware that this is a big deal, you know, they may think everybody does this – when they don't. So we have an initial session where we just try and make sense of our approach, and then what we do is we have one or more workshops in which we get them to look at examples of classroom talk, be critical of it themselves, bring it out into the open in a way that they can sort of examine it, and then get them to do some activities themselves where they think together. We've got some quite fun activities that for adults in which they can try and solve problems together, and so in that way they start to get an insight into how you can discuss well or not. And then we with those teachers design some classroom activities which embodied this approach and that were applied to the various curriculum areas, subsequent projects we've kind of adapted those to suit different curriculum subjects, different age groups, or whatever, so we kind of work through in that way.

For teachers to use talk effectively in the classroom the first main step is to become self aware of how you habitually use language, and then beyond that I think it's to focus on certain aspects of using language. An obvious one is how do you use questions, and this is the one I would normally, you know, encourage teachers to start looking at first or student teachers. The obvious way for a teacher to use a question in a classroom is to find out whether a child knows something or not. Now teachers all use a lot of questions and that in itself isn't a bad thing, but if the only kind of questions they're asking are – do you already know this fact that I'm asking you or not? – then it's a very limited use of language and a very limited use of the particular form of language that we call a question. I mean a more unusual but important way of using a question is to ask children why they think something – well why do you think Lima is the capital of Peru? Well because it's the biggest city there, you told us that, because we

also read that the government is based there, because you know it figures in all the main documents, you can go on, so they would justify their explanation in that way. And at all levels teachers can ask why questions, and by asking why questions you start to get the children to think about why they're giving their answer and what their reasons are, and what the substance of their knowledge is. One of the obvious ways that a teacher would use language effectively, is to balance the kind of questions they use and be aware of why they're using them. You also want to ask exploratory questions to just find out where they're already at, what they already know that you can take for granted safely and what you can't, so in that way the teacher's starting to use questions in a number of quite different ways that aren't just the traditional interrogation form of a question, so that's one of the ways that I would suggest that a dialogic teacher uses language effectively. Other ways would be to look at the balance between their own use of language and the child's use of language. In most classrooms when I record I then get it transcribed, and when I see the transcription nearly all the talk will be by the teacher, so all the long bits are the teacher, all the little bits are the child. In dialogic classrooms, at least some of the time, I can't tell because children are taking longer turns and they're explaining their ideas at greater length and the teacher is the one who's making more minimal interjections. So there's that kind of balance can be achieved by a teacher through this developing self awareness of thinking well, what do I want to do at this point in the lesson? Do I really want to give them some more facts or do I want to see whether what I've told them already has sunk in, do I want to see whether they've got any queries, do I want to see if they've got any misunderstandings, do they want to see if they've got any interesting new ideas that we could pick up and use in the next lesson, depending on what subject it is?

Narration

So how was the project evaluated, and what does the evidence reveal about the effectiveness of dialogic teaching?

Neil Mercer

In most of our research we've used what is now come to be known as a mixed methods approach, as we tell students on the research and methods course here. What it really means is that we've decided, along with a lot of other education researchers, that it's not such a good idea to have a sort of ideological affiliation to a certain sort of method of doing research. That has tended to be the case that people say oh, I'm a qualitative researcher, I like to deal with whole people in real life settings. While other people would say well, the only way we really can make systematic sense of the world is by using systematic methods where we've got numbers and we can statistically compare before and after, and differences, and so on. I think we've now moved to a point where we say well, what questions do you want to answer, what are your questions, and what are the best methods for answering them, and is one of those approaches really incompatible with the other—can we not look at whole people in real settings, but also get them to do some tests? Can we not look carefully and sensitively at what teachers are doing, take account of what they think, look at their subjectivity, but also see whether the kids actually learn more or better at the end, and so what we really do is use a mixture of these methods. We've also been able to use some very interesting new methods that have come out of linguistics where you can use quantitative ways of looking at language change where you actually look for the increase of incidents of certain words, key words that represent, ideas or ways of, ways of talking, or key structures, so you can start to see more of a certain form of language or a certain kind of word, and do they ask more questions, you can do lots of things like this, which aren't strictly experimental but do give you some kind of quantitative comparisons and then, ideally, you move between these two different methods so you never forsake, your real talk data of real people in real classrooms, but you move between it and these much more detached abstract kind of results that give you more immediate impression of whether something's changed or not.

In schools where we've worked closely with teachers in these research projects, concentrating on dialogue and the development of skills of *Thinking Together*, we do normally see a significant change in attitudes to talk. I think the children themselves start to see why they're being asked sometimes to go and sit in groups and talk, and the teachers themselves feel it's easier to justify setting up group activities rather than feeling this is time out from delivering the curriculum, so you do get that shift. It varies to what extent I think that becomes, if you like, embedded and continuous in schools. It helps if the whole school takes

part, it's vital that the Head thinks it's worthwhile. There's got to be an institutional basis for the change for it to be long-lasting and secure and that's why I think it's vital that the National Curriculum, the national strategies and so on in the UK have this as part of their essence. It's got to be part of what teachers think they have to do, not just what it's nice to do.

As a result of the research we've done over the last, well more than a decade now, I'm firmly convinced that one of the most important things that a trainee teacher can learn is how to use spoken language effectively in the classroom. I think teachers will find their jobs easier if they do so, it is part of being a good teacher that you use language well, it's just that too often I think it's left for individuals to discover that for themselves or not, so I would make that much more explicit. For policy makers I think the big message is that if you don't give spoken language real prominence then the other things you're trying to achieve – mathematics development, literacy development, citizenship development, are less likely to happen. Effective use of spoken language is the tool by which these things get done. Teachers don't just need to celebrate children's language, they need to actually teach children how they can use spoken language more effectively, not because they're using it wrongly already perhaps, but because they need to broaden their repertoires. It's not a matter of good English, bad English, it's a case of you've got more resources, and you're a more capable citizen, person, learner, whatever, as a result.