

## Using interactive whiteboards to orchestrate classroom dialogue

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This paper focuses on the use of interactive whiteboards (IWBs) as a tool for encouraging and supporting classroom dialogue. Our concern here is with the promotion of ‘dialogic’ communication between teachers and students, which is now widely recognised as educationally valuable. In this study we investigated how teachers could use the *technical interactivity* of the IWB to support *dialogic interactivity*. The design of the study was predicated upon a partnership between the authors and three UK (primary, middle school and secondary) teachers of 8- to 14-year-olds; examples of practice reported here derive mainly from secondary history. Outcomes include illustrative examples of teachers’ effective strategies for using the IWB for orchestrating dialogue. Implications for teachers’ initial training and professional development are considered.

Keywords: dialogue, interactivity, IWB, ICT pedagogy

### Introduction

This paper reports research on how the interactive whiteboard (IWB) can be used to support and enhance classroom learning through ‘dialogic’ teaching. The study took place in the context of almost total saturation of UK schools with IWBs. It builds upon our previous work on the critical role of the teacher in purposefully exploiting digital tools to support subject learning. This approach differs from that of most other research into educational technology, which typically highlights the potential of the tools for ‘transforming’ learning. In this paper, our particular focus is on how teachers can exploit the technical interactivity of the IWB to support dialogic interactivity. We have asked: *How can teachers using a ‘dialogic’ approach to teaching exploit the multimodality and interactivity of the IWB to support student learning?*

As we will explain, drawing on the work of Alexander (2004) and others, we characterise a dialogic pedagogy as one that actively builds on learners’ contributions, engages both teachers and students in generating and critically evaluating ideas, and encourages explicit reasoning and the

joint construction of knowledge. In our study, the three participating teachers first engaged with us in discussions about dialogic teaching that were informed by previous research and which aimed for practical outcomes. The teachers then developed classroom activities using the IWB during whole class teaching and any associated group work.

### **Background: Classroom use of interactive digital technologies**

The introduction and promotion of educational technology through government initiatives in the UK has generally been ‘technology-led’, rather than being more appropriately ‘educationally-led’ (Dawes, 2001), with the result that little attempt has been made in such programmes to link technology use to the needs of teachers and students, or to what research has shown are effective ways of teaching and learning. Programmes for training teachers to use new technologies have also suffered from what Lankshear (1997) described as ‘applied technocratic rationality’ – a view that technology has an independent integrity and a power that can be unleashed through learning certain basic skills. In sum, research, policy and training initiatives have often tended to ignore the vital need to relate the use of new forms of technology to what is known about effective pedagogy.

In the UK, there has been substantial government investment and policymakers’ interest in IWBs in education and an exponential increase in their numbers in UK schools (sixfold between 2002-05: Kitchen, Mackenzie, Butt, & Finch, 2006) before the implications for teaching and learning were even investigated (e.g. Smith, Higgins, Wall, & Miller, 2005). Nevertheless, teachers and learners are enthusiastically adopting this powerful tool, which seems ideally suited to supporting interactive whole class teaching. In practice, however, it seems in many cases to be associated with superficial collaboration, motivation and participation at the expense of uptake questioning (Higgins *et al.*, 2005), student talk and reflection (Becta, 2003; Gillen, Kleine Staarman, Littleton, Mercer, & Twiner, 2007; Kennewell & Beauchamp, 2007; F. Smith, Hardman, & Higgins, 2006). Government-funded research shows that pressure to ‘get through’ curriculum content means that IWB use may decrease thinking time and opportunity for learner input, resulting in teacher-only operation (Moss *et al.*, 2007). In our earlier studies of IWB use in secondary science, students’ physical manipulation of objects was desired by teachers but constrained by systemic school and subject cultures, curricular and assessment frameworks (Hennessy, Deaney, Ruthven, & Winterbottom, 2007). Nevertheless the large-scale SWEEP study of primary teachers (Somekh *et al.*, 2007) indicated that IWB use became embedded after a period of 2 years and new or improved pedagogical practices then began to emerge. Around a quarter of teachers reported more interactive lessons with greater active pupil involvement, made possible by the functionality of the board.

### ***The technical interactivity of the IWB***

Interactive whiteboard systems comprise a computer linked to a data projector and a large touch-sensitive electronic board displaying the projected image; they allow direct input via finger or stylus so that objects can be easily moved around the board or transformed by teacher or students.

‘Flipchart’ software provided with the board or obtained separately provides a variety of functions, including those which replicate non-digital technologies such as flipcharts, dry-wipe boards, overhead projectors, slide projectors, and video-players, and others which have not previously been possible on a large, vertical display. These comprise ‘technical interactivity’ (Smith et al., 2005) and as Beauchamp & Parkinson (2005), Miller *et al.* (2005) and others have noted, these functions include:

- drag and drop (objects on the board can be matched or moved around);
- hide and reveal (objects placed over others can be removed or ‘rubber’ reveals hidden text);
- highlighting (transparent colour can be placed over writing or other objects);
- spotlighting (view restricted to circular area of screen);
- animation (objects can be rotated, enlarged, and set to move along a specified path);
- annotation of objects displayed (textual or graphical);
- tickertape (text moves continuously across screen);
- indefinite storage and quick retrieval of material, ‘flipcharts’ and annotations;
- feedback (when a particular object is touched, a visual or aural response is generated);
- automatic handwriting recognition and text formatting features.

### ***The dialogic interactivity of the IWB***

By distinguishing between ‘technical’ and ‘dialogic’ interactivity, we intend to highlight the distinction between what a piece of technology can do, and what it can be used to achieve educationally. The IWB offers teachers and students a ready facility for finding, entering, modifying and saving text and other items relevant to their task in hand. It is ‘interactive’ in the sense that it responds easily and quickly to the user’s commands. Our interest, however, has been in if and how this facility can be used to support the dynamics of educational dialogue – and whether it offers special advantages over alternative ‘tools’ for doing so. This interest has been shaped and informed by research that takes a sociocultural perspective on education, as we will explain.

### ***Dialogic teaching and a sociocultural perspective on the use of ICT in the classroom***

A sociocultural perspective highlights the significance of mediating tools (or ‘mediating artefacts’) and technologies in the social processes of learning (Säljö, 1999; Wertsch, Tulvoiste, & Hagstrom, 1993). This perspective emphasises the role of language as the prime cultural tool, while also in more recent years offering valuable insights into the use of computer-based technology (for example Crook, 2007; Dawes, Mercer, & Wegerif, 2004). This perspective has formed the main

basis for the development of a ‘dialogic’ pedagogy: an approach in which the teacher strives for the active involvement of students in the process of knowledge construction through the use of talk and other means of communication (Alexander, 2004). In recent years, other researchers have also made persuasive and influential arguments for the importance of the quality of teacher-student dialogue in the development of children’s understanding of science and other curriculum subjects (Lemke, 1990; Mortimer & Scott, 2003; for example, Wells & Bell, 2008). Cutrim Schmid (this issue) refers to similar developments in the field of language teaching and learning. Interventional, school-based studies have provided supportive empirical findings (for example, the research in Mexican schools reported by Rojas-Drummond & Mercer, 2004; and the UK-based research reported by Mercer & Littleton, 2007). The work of Brown and Palincsar, carried out in the 1980s and explicitly linked to Vygotskian theory, was a significant early contribution in this respect (e.g. Brown & Palincsar, 1989). Their *Reciprocal Teaching* approach involved the use of specific dialogic strategies by both teachers and children in primary/elementary school. One of its aims was to encourage more critical and elaborated contributions from pupils, who made impressive gains in reading comprehension. More recently, Kim, Anderson, Nguyen-Jahiel & Archodidou (2007) have shown that the similar kind of teacher-led dialogue they call *Collaborative Reasoning* leads to improvements in reading comprehension and the quality of written argument for secondary/high school students.

The dialogic approach to teaching involves orchestrating classroom talk and activity so that teachers and learners are actively commenting and building on each other’s ideas, together posing questions and co-constructing interpretations (Alexander, 2004). Preconditions for dialogue include open-ended tasks and higher order questioning, and a supportive classroom ethos for exploring and sharing ideas. Recent incarnations of national examinations and policy strategies in the UK have moved increasingly towards an emphasis on classroom discussion of controversial topics and development of dialogue skills in some subjects. Yet a conflicting policy and school inspection emphasis on rapid lesson pace (disregarding the desired pace of learning) and soliciting correct answers, coupled with many teachers’ and policymakers’ lack of understanding of dialogic pedagogy, mean that dialogic teaching is not commonly observed: ‘In many classrooms most of the dialogue appears to occur more by accident than in a deliberate, conscious manner’ (Smardon & Bewley, 2007, p. 2 ).

Research has suggested that multimodal technologies such as the IWB can contribute to the creation of a ‘dialogic space’ (Wegerif, 2007), wherein educationally valuable dialogue and teacher-guided learning can take place (Gillen, Kleine Staarman, Littleton, Mercer, & Twiner, 2007). To understand if and how it can do so, we need to consider not the potential functionalities of the IWB, but its actual uses in classroom contexts and teacher perceptions of those uses. The main question that this paper addresses is thus: *If teachers are consciously aiming to enact a dialogic, interactive*

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*pedagogy, how can/do they use the technical interactivity of the IWB to do so?* Our particular focus in this study is with archetypal use of the IWB in whole class teaching. Elsewhere, we have explored the use of the IWB by collaborative pupil groups during lessons: Warwick, Mercer, Kershner, & Kleine Staarman (2010, in press).

### **Research participants, methodological approach and research strategy**

Our study involved three teachers who use an IWB as an integral part of their everyday practice. Participants were selected on the basis of having an observably dialogic pedagogical approach to teaching. They included a Deputy Head Teacher who worked with primary children (aged 10-11) and who focused on Personal, Social and Health Education; a Head of English who focused on crime story writing with middle school children (aged 12-13); and a Head of Humanities who worked with secondary children (aged 13-14) on World War 1. In this article we draw particularly on the latter case.

The teachers participated in a series of workshops on dialogic teaching, before going on to design and trial IWB-supported lessons. (They had a total of 6 days each of funded release time from teaching to enable them to participate.) Collaborative video analysis and discussion of ‘critical episodes’ (see Phase 3) were then enabled an examination of how IWB use supported classroom dialogue. Our methodology is summarised below (and described in more detail by Hennessy, Warwick, & Mercer, 2010, in press).

### ***Phases and methods of research***

*Phase 1:* Teachers were observed and video-recorded teaching a topic over two lessons each, to familiarise the team with their current practice and to pilot our recording procedures. They all participated in three one-day workshops, in which video data from the six pilot lessons, along with footage of other teachers using IWBs during an earlier research project ('T-MEDIA': Hennessy & Deaney, 2009), were used as a stimulus for discussion. The teachers and researchers evaluated illustrated approaches and assessed their applicability to the teachers' own contexts, discussing ways of further exploiting the IWB technology to enhance their approaches. The nature of productive classroom dialogue and ways to encourage it were also discussed. Teachers were encouraged to keep unstructured diaries of their reflections on pilot lessons and workshop experiences. Other resources included professional development activities generated through a series of ‘Thinking Together’ projects (conducted with other teachers) as reported by Dawes, Mercer, & Wegerif (2004) and Mercer & Littleton (2007: see <http://thinkingtogether.educ.cam.ac.uk/>). These activities help teachers to engage children in classroom dialogue. Copies of Alexander's (2004) pamphlet on Dialogic Teaching, a chapter on

forms and functions of teacher-student dialogue (from Mortimer & Scott, 2003), and a short article on questioning strategies (Cardellichio & Field, 1997) were distributed too.

*Phase 2:* A sequence of three lessons was video-recorded in each classroom. The teachers kept diaries of their pre- and post-lesson reflections and planning. They were interviewed once about their plans (using a semi-structured schedule) and twice again after lessons about using the IWB to support dialogue and how successful their actions had been (two post-lesson interviews increased the database without being overly demanding). Flipchart files and captured annotations, lesson plans, worksheets, digital photographs and copies of pupil work provided valuable additional data.

*Phase 3:* Copies of the videos were distributed and the whole team reconvened for a fourth half-day workshop to review our experiences, to share teacher-selected video clips and to use these in defining criteria for identifying ‘critical episodes’ of the phenomena of interest (9-10 per case), as follows. Selected episodes (a) collectively illustrated a range of IWB uses and (b) included dialogue that was perceived to be stimulated by well-selected resources that were engaging and/or meaningful to learners; linked with any level of IWB use but including some pupil ownership of the board; arising from opportunities for focused, cumulative, open-ended discussion in whole class, pairs, or groups; moving forward students’ learning.

Discussion of critical episodes chosen and commented upon independently by teachers and researchers, along with diaries and interview transcripts, was then carried out by one researcher with each teacher. They exchanged their thoughts and selections, then met for 3–5 hours to compare and reconcile them, reviewing video-recorded episodes or screen shots as needed. Analytic commentary, interspersed with direct quotes about the episodes from the post-lesson interviews, and the outcomes of the negotiations were incorporated into a set of review notes for each case (drawing on the meeting transcript). These described the part played by the technology and the teacher in each chosen episode, the underlying rationale and effectiveness of the pedagogical approach in terms of quality of dialogue, and the level of student participation.

The process enabled us to identify what the data in each case revealed about the integration of IWB use for supporting substantive teacher-student and student-student dialogue. The teachers’ pedagogical approaches were thereby evaluated with reference our criteria for dialogic teaching (as defined above). This phase culminated in a final agreed set of critical episodes from each classroom, a rationale for their selection, and some conclusions about dialogic pedagogy in the context of IWB use.

*Phase 4:* A final (fifth) half-day workshop focused on the expected impact of participation within the schools and the perceived obstacles to adoption of a dialogic approach and to IWB use

by novices (as reported by Hennessy et al., 2010, in press; and Warwick, Hennessy, & Mercer, 2010, submitted).

*Phase 5:* Finally, the research team conducted a cross-case analysis comparing and contrasting approaches to exploiting the IWB to support a dialogic approach in the three very different settings. We trawled teacher diaries, interviews, workshop and review meeting transcripts, and accreditation reports using HyperResearch™ 2.6, a software tool for qualitative data analysis, coding material pertaining to teacher strategies for using the IWB. We also revisited videos of critical episodes and annotated the transcripts with comments on dialogue quality and teacher strategies in order to identify how shared understandings and new interpretations were being progressively created through the dialogue, and to examine what sorts of connections were made during interactions within and across critical episodes. A series of screen shots and photographs of IWB artefacts in the making were also prepared for interpreting the rich and complex classroom interactions that took place.

## Findings

The data reported here derive mainly from our critical episode and transcript analyses; space does not permit embellishing the account with interview, meeting and accreditation report extracts but these are evident in a paper focusing on the research collaboration (Hennessy *et al.*, 2010, in press). In Phase 1, teacher workshops and pilot video recording received an enthusiastic response from all of the teachers, yielding a range of thoughtful diary reflections such as the following typical comments:

Sense of teachers and researchers with a common purpose . . . Particularly important is that while the IWB is a key tool, it has to serve learning purposes. (Lloyd)

The first workshop day has enabled me to really start thinking in depth about my own practice and the powerful impact a more structured approach to ‘talk’ in the classroom could have . . . Alexander [2004] – the idea of dialogic teaching being cumulative, with children and teachers building on each other’s ideas, really stood out for me, as it is the one which I feel I currently address the least. . . in order to move forward, I need to look now at . . . using questioning more effectively to enable cumulative talk to take place more regularly. (Caroline)

All of the teachers took up the opportunity for university accreditation (a Certificate of Educational Enquiry) through writing a report of their experiences, and one has gone on to Masters study. An important outcome from this preparatory work with the teachers was to operationalise dialogic teaching with the IWB. That is, one aim of the discussions was to identify the kinds of dialogic strategies that the IWB could help the teachers carry out. During this discussion, we agreed that dialogue *should make reasoning explicit and support the cumulative co-construction of knowledge and understanding*. We also agreed that a teacher might use the IWB to carry out any of the following pedagogic intentions:

- Scaffold learning
- Support the temporal development of learning;
- Involve pupils in co-constructing knowledge;
- Encourage evaluation and synthesis;
- Develop a learning community;
- Develop pupil-pupil dialogue;
- Support provisionality of students' evolving ideas;
- Guide lesson flow;
- Develop pupil questioning.

The group's conception of dialogue (as a way of creating collective meaning) widened to include the use of nonverbal dialogue at the IWB – including sharing understandings or creating new digital artefacts through annotation, drawing, manipulation, linking, sorting etc. (often in conjunction with talk) – and non-verbal dialogue away from the IWB including, for example, producing diagrams, drawings or ordered elements, and manipulating/annotating paper replicas of IWB images. The role of mediating artefacts in making emerging thinking explicit and supporting the progression of dialogue over time is explored in more detail by Hennessy (in preparation).

### **Case study: using the IWB to teach history**

Because of space limitations, our choice in this paper is between giving three or so small examples of different teachers using the IWB during a lesson, or showing in more detail how one teacher used it during a series of lessons. We have chosen to do the latter, because we accept Alexander's (2004) view that one important aspect of dialogic teaching is its cumulative nature. That is, dialogue should be used to help students develop a learning trajectory, or pursue a 'learning journey' over time. We have therefore taken examples from a series of three lessons about World War 1 that were recorded in one history teacher's classroom with students aged 12-13.

#### ***Example 1: whole class discussion of a non-fiction text***

The first example comes from the first lesson. The title the teacher gave this lesson was 'What can poetry tell us about the Western Front?' but he used further, non-fiction texts and other resources to explore this theme, presenting them on the IWB. He first put up an extract from an army doctor's notes, and asked one of the students to come up and annotate it. The student did so, as shown in Figure 1.

INSERT FIG. 1 ABOUT HERE

*Transcript 1: the doctor's account*

T: Right, look on the board here, this is what a doctor wrote in 1914 at the start of the war. What are the significant things about what he wrote here? What significant things, somebody come up and underline something off the front row, Henry could you come and do it for me? Come and underline something that's significant about what he's written here.

*(Henry walks up to IWB, presses pen tool on IWB and begins to underline without talking)*

T: Yep, and what else?

*(Henry continues underlining)*

T: Very good, who can explain why Henry has underlined those things? Robert.

Robert: It showed that at the beginning of the war people thought it was a good thing.

T: Excellent, brilliant it was a good thing, people thought at the start of the war. Alex would you agree with that?

Alex: Yes.

T: Is there anything that Alex you might underline that Henry hasn't?

Alex: Umm..

T: OK Henry, just explain why you've underlined that. I completely agree with you, thanks Alex that's great, thanks Robert.

Henry: Well because this the first part is talking about how you might get sent to the front of the front line of the war which would probably be to do with the trenches.

T: Yep.

Henry: And he thinks it's like a good thing, like an honour and so he'd be really, he thinks he'd be really happy if he was sent there. He's envying his friend, the soldier who's gone off as well and hopes he will as well.

*Comment*

The IWB offers the facility for teacher and students to share and discuss ideas on texts in a whole class setting – and the teacher uses this quite effectively here to stimulate some whole-class dialogue about both the target text and Henry's underlined parts of it. In relation to the earlier list of pedagogic intentions that a teacher could pursue with the IWB, it can be seen here to be used to 'scaffold' the pupils' learning, because it enabled the teacher to provide a material support for the development of their ideas. It also helped the teacher involve the pupils actively in co-constructing knowledge and understanding. Of course, this could have been achieved without an IWB – for example by the teacher pinning up a large copy of the text on the wall for Henry to annotate. It is hardly ever the case that the IWB provides a completely unique kind of opportunity which could not have been achieved using other technology. Moreover, this use of the IWB is hardly innovative. But we argue that one should not judge teachers' uses of the IWB by how 'whizzy' they are; we should judge them by how well they harness the technology to serve effective pedagogic strategies – those that stimulate and move on student thinking. The ease with which this kind of technological interactivity can be achieved using the IWB means that it may encourage teachers to set up such opportunities for dialogue when they would not otherwise feel they had the time to do so. A key advantage is that the student's annotations can much more easily be modified, stored or revisited

than if a paper copy was involved. The IWB in this way supported the provisionality of the students' developing understanding.

Regarding the quality of the dialogue – we see here some interaction between teacher and students which, in Mortimer and Scott's (2003) terms, is more 'dialogic' than 'authoritative'. It is certainly the case that the dialogue adheres to the usual Initiation-Response-Feedback (IRF) pattern of classroom talk, but the teacher uses his questions to elicit a variety of students' views. And although he provides positive feedback on their responses ('Excellent, brilliant'), he does not define their answers as 'right/wrong' as would be the case in the more archetypal, 'authoritative/interactive' dialogue. Moreover, the students take turns which are longer than the typical responses of students to teachers' questions. In these ways, the transcribed passage has some characteristics of dialogic teaching (Alexander, 2004). In this example, we can see how the technical interactivity is being used successfully to enable dialogic interactivity.

### ***Example 2: pair and whole class discussion of a poem***

Later in the same lesson, the teacher put up on the IWB a poem about life in the WWI trenches by Wilfred Owen, 'Dulce et Decorum est', which he had introduced in Lesson 1. It is a graphic account of the deprivations of war, as when Owen recounts:

Men marched asleep. Many had lost their boots  
But limped on, bloodshod. All went lame, all blind  
(Owen, 1983)

The teacher was able to use the multimodality of the IWB to show some relevant photographs, downloaded from a web source, such as that shown in Figure 2.

INSERT FIG 2 ABOUT HERE

The teacher then used the 'cover and reveal' facility of the IWB to highlight just the first two lines of the poem. He asked the students to discuss these two lines with a partner: 'Ask your partner what they think is interesting and ask them why'. The teacher interacted with some of the pairs while they did so. A whole class discussion then followed, in which the teacher attempted to elicit from the pairs what they had discussed, as in the following extract. Each pair of students had a small (non-digital) whiteboard on which they could record their responses.

### ***Transcript 2: identifying interesting words***

T: Tell me, key words that you think there. I tell you what I'm going to change that, interesting words that you think there are. Just write on your whiteboard one interesting word and why you think it's interesting.

*(Class working silently)*

T: Right see what your partner thinks. Ask your partner what they think is interesting and ask them why. Go.

*(Class discuss in pairs)*

Students in one pair: ...knock-kneed...he a really nice...*(whispering)*.

T: *(to a pair of students)* Right Ricky what have you got? Knock-kneed. Imagine, explain that for me, what's it mean to you, conjure up an image of it.

Ricky: *(inaudible answer)*.

Other student: ...that's a bit scarier than that.

T: A bit like what Joe and Daniel, yeah I do it like that and these are in like that. OK. *(To whole class)* Right, somebody, something interesting then please about the poem. What do we think about the poem.

Ricky: Knock-kneed.

T: Ah, Ricky, me and Ricky have just been saying knock-kneed is an interesting one. I think Joe and Daniel, for me am I right, they've seen that because they emphasised that quite a bit in their dramatisation. What's it mean to you?

Joe/Daniel: They say that their knees have been worn out quite a lot, they're old and they're bruised or broken.

*(This discussion continued for several minutes)*

### *Comment*

Here we can see that the teacher used the 'cover/reveal' facility of the IWB to focus students' close attention on to part of the poem – thus scaffolding their learning about it by reducing the complexity of the task. He then used this resource to develop pupil-pupil dialogue (as in the list above) by allowing them time and 'dialogic space' (Wegerif, 2007) in pairs to think about and share their joint responses and feed them back to the rest of the class. Throughout this discussion, several took turns in the dialogue that were quite extended (though they still did not match the typical length of turn taken by the teacher), resembling the kinds of student contributions seen as valuable by advocates of 'dialogic' pedagogies (Alexander, 2004; Kim et al., 2007).

### ***Example 3: imagining the experience***

The above discussion of the poem and pictures were followed up in the third lesson of the series, in which the teacher led a discussion of the question 'Is it possible for us to imagine the experience of trench warfare?' (written up on the IWB). The teacher initially played the class an audio recording of the sounds of trench warfare, and also played a (silent) film on the IWB. Part of this discussion (edited for brevity) is transcribed below.

### *Transcript 3: imagining trench warfare*

Ricky: It's like when you imagine winning the lottery. . . it wouldn't necessarily be like what you think.

Robert: You can imagine what it would look like, but you can't imagine what it would feel like or how you would be feeling.

Owen: Yes, because on the DVDs or on the films and the poems and stuff, it explains and you can see what it looks like, in wasteland, and you're both in trenches, but you wouldn't know what it was like to go ages without food or water.

Ricky: That's partially true, but you wouldn't know what it would be like to be shot by a bullet or be bombed or something. You wouldn't see what it looked like either.

Felix: Every single person's experience with it would be different. Everybody's got different feelings towards the war, and you wouldn't know what anyone would have felt like, even if we were there, you would only know what you felt like.

T: Yes, can we ever achieve a common understanding of anything?

The teacher used the IWB to sum up the main points of the discussion, as shown in Figure 3.

INSERT FIG 3 ABOUT HERE

### *Comment*

As the extract in Transcript 3 shows, the teacher successfully elicited some relevant and interesting views on the question offered to the students. The discussion was certainly ‘dialogic’, in Mortimer and Scott’s (*op.cit.*) sense, because students offer a range of reasoned views – and it is also ‘interactive’ as those views are debated and synthesised by the students. The teacher took a non-evaluative, commenting role. The IWB is at this point being used simply to record the outcomes of the class discussion, which could be done as easily with non-electronic technology. But the more salient point is that this same technology acted as a ‘digital hub’, enabling the teacher to easily show a wide range of digital resources presented in different modalities – poems, a historical diary, photographs, audio and visual tracks of a film played separately. These functioned as pivotal stimuli for the subsequent discussion, and to allow students to annotate texts, while he led classroom discussions about them. With reference to the earlier list of teaching ‘intentions’, the teacher used the IWB to guide lesson flow and encourage evaluation and synthesis. By basing the discussion and group activity throughout the series of three lessons on this flexible yet coherent (and annotatable) set of resources, he could also be seen to support the temporal development of learning and develop a learning community (which, according to Alexander, 2004, is one of the key aspects of dialogic teaching).

### **Discussion**

By conceptualising the use of the IWB within a framework of dialogic teaching, the teachers in our project have been encouraged to look for effective ways of exploiting its interactive and multimodal features to support their pedagogic aims. As a result, both the teachers and researchers considered the functionalities of the IWB from a pedagogic perspective (rather than, say, attempting to use all the functionalities because they are available). With this in mind, let us re-consider our central research question: *How can teachers using a ‘dialogic’ approach to teaching exploit the multimodality and interactivity of the IWB to support student learning?* For reasons of space, we have only shown a few illustrative examples from practice. But our analysis shows that these were typical in the sense that a wide range of visual (including video), auditory and text-based functions was used by the three teachers and their pupils as stimuli for reasoning. Moreover, in each case

teachers encouraged students to test provisional ideas. Individual and collective thinking were embodied within a series of evolving digital representations that were purposefully manipulated, reformulated, annotated, saved and/or revisited so that meanings were created cumulatively over time through sustained, responsive dialogue. The extent to which the dialogues promoted were educationally effective (or at least could be judged to be so, from our perspective) varied, of course.

Further teacher strategies observed in all three cases included engaging all students vicariously in IWB activity and intertwining this with other kinds of activity. These strategies are further elaborated by Hennessy (in preparation) and they resonate with findings from Cutrim Schmid's longitudinal study (this issue) of a language teacher developing competency in designing more open IWB-based materials, managing interactions mediated by the IWB and rationing IWB use. While we acknowledge that our teachers had already developed a dialogic pedagogy, we know from other studies (e.g. Mohon, 2008; Warwick *et al.* in press) that adopting a dialogic approach is demanding for teachers, in terms of both lesson preparation and the interactive demands on them during the lesson. In the early stages of its adoption, at least, it seems to require a degree of awareness on the part of the teacher that is almost certainly not commonplace. It is not easy for teachers to transcend the conventional patterns of classroom interaction, even if their aim is to do so. However, it can be expected that, over time, the relevant strategies will become less self-conscious and more a natural part of classroom interaction.

It is clear from our study that the IWB allows a flexibility in the marshalling of resources that enables teachers to create interesting multimodal stimuli for whole-class dialogue much more easily than do other technologies. However, it is the (evolving) pedagogy that determines the nature of IWB use – it seems that a tool such as the IWB can present new possibilities for a teacher, but it is as the servant of pedagogy and not its master. It is through the orchestration of the perceived affordances of the IWB that such dialogic intentions of teachers can be fulfilled. The same function of an IWB may be used to support dialogic or more traditional didactic strategies. However, those teachers with dialogic intentions strive to employ a variety of IWB functions to enhance the quality of pupils' learning experience. Thus the effective use of the IWB as an educational tool is not inherent in the hardware, software or even the materials it displays. It is predicated upon the teacher's practical understanding of how to engage students and to help them learn. Any training that teachers – especially pre-service teachers – receive in the use of such technology -needs to take this into account.

The outcomes of this study thus form a basis for wider professional development, and we are currently working with the teacher participants to share with others the lesson materials and video footage illustrative of supporting dialogic teaching with the IWB. The framework for describing pedagogic strategies that we co-constructed during our analyses should also prove

useful. Collectively these resources might serve to stimulate discussion, development and trialling of dialogic approaches by pre-service teachers or colleagues working in other settings. They are freely available via our website at <http://dialogueiwb.educ.cam.ac.uk/>.

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Figure 1: Henry's annotations

If I ever get sent to the front with a regiment, I shall shed tears of joy. I do envy Chris going off so soon but I think this dog will have his day soon too.

We expect to be moved to the front at any moment. The men apparently will be in the trenches alternate 24 hours, changing with a fresh lot of men during the night. I am behind HQ, probably a dug out where I sit and wait for the wounded to be brought to me. I am told that doctors are not allowed in the trenches. I am told that the feeding at the front is splendid and there is a Daily Mail for every 10 men.

Our men have had a terrible experience of 24 hours in trenches, drenched through and in some places knee deep in mud and water. To see them come out, line up and march off is almost terrible. They don't look like strong young men. They are muddied to the eyes. Their coats are plastered with mud and weigh an awful lot with the water that has soaked in. Their backs are bent and they stagger and totter along with the weight of their packs. Their faces are white and haggard and their faces glare out from mud. They look like wounded, sick, wild things. Many, too many who are quite beat are told they must walk it. Then comes the nightmare of a march of 2 to 4 miles which they do in a trance.

Figure 2: One of the photographs displayed by the teacher



Figure 3: The teacher's summary of the main points raised in the discussion

work  
rest  
play

Is it possible for us to imagine  
the experience of trench warfare?

Living conditions      Yes, what it  
looked like

Medical conditions      Not what it  
felt like

Fighting conditions

Doctor  
Poem  
video  
DVD  
Discussion

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