LISTENING: A CASE STUDY OF TEACHER CHANGE

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The data for this study is taken from a project [1] looking into the development in year 7 students (aged 11-12) of a 'need for algebra' (Brown and Coles, 1999) in four teacher's classrooms in the UK. I introduce the notions of evaluative, interpretive and transformative listening, (adapted from Davis, 1996), to analyse three transcripts from lessons of one teacher on the project. The project design and case study were informed by ideas of enactivist research (Varela, 1999, Reid, 1996). A change occurred in Teacher A's classroom, as shown in the transcripts, and the listening of both students and teacher became transformative. There is evidence that specific teaching strategies were linked to this change in listening. Once the change occurred the students started asking their own questions within the mathematics.

BACKGROUND

In the summary of findings (Coles, 2000) from a one year teacher-research grant (awarded by the UK's Teacher Training Agency (TTA)) I identified teaching strategies that were effective in establishing a 'need for algebra' (Brown and Coles 1999) in a year 7 class (students aged 11-12 years) whom I taught. Evidence for students finding a 'need for algebra' was that they were able to ask their own questions about complex mathematical situations and structure their approach to working on these questions.

The results of the TTA research formed part of the background to a current research project [1], funded by the Economic and Social Research Council (ESRC). This project involved three other teachers, who had all been part of a steering group on the TTA research, and wanted to work at developing a 'need for algebra' in their own year 7 classes (the first year of secondary school in the UK).

Since a 'need for algebra' was linked to students asking their own questions, whole class discussions in which students developed these questions were seen by all the teachers on the project as being a vital component of their lessons. If discussions amongst a whole class (around twenty six students for each teacher) are to be effective in allowing students to develop their own ideas, then the quality of listening of the students is a key factor.

LISTENING AND HEARING

I take listening to involve an act of will or decision on the part of the listener. There is an important distinction however between a listening that is active but where no connection is felt with what is said and times where a connection is made and the hearer is changed by what they hear. I have found this distinction useful in thinking about discussions but, in analysing dialogue, I needed a finer grained, observable categorisation. I found this from adapting Davis (1996)'s forms of listening.

THREE FORMS OF LISTENING

(1) Evaluative listening

If a teacher is listening in an evaluative manner then they will characteristically have a ‘detached, evaluative stance’ (Davis, 1996 p.52) and they will deviate ‘little from intended plans’ (ibid). For such a teacher 'student contributions are judged as either right or wrong ... listening is primarily the responsibility of the learner’ (ibid). The teacher makes assumptions based on a supposed ‘knowledge of the other’s subjectivity’ (ibid) or rather the assumption is the students have knowledge of the teacher’s subjectivity - hence it is the student’s responsibility to listen and learn from the unproblematic access they will thus have to the teacher’s thinking.

If students or teacher are listening in an evaluative manner then they would see what others say in terms of right or wrong, and see listening as the others’ responsibility. This is indicated by, for example, someone responding immediately to another’s suggestion with a judgement that it is incorrect (or correct).

(2) Interpretive listening

Interpretive listening is characterised by an awareness of the ‘fallibility of the sense being made’ (Davis, 1996 p.53). If I hear someone while listening in an interpretive manner then along with whatever connection I make, or any idea that arises, or whatever meaning I take from the words, I am aware that this may not be the connection, idea or meaning the speaker intended. There is a recognition that listening requires: ‘an active interpretation - a sort of reaching out rather than taking in’ (ibid). A response might offer feedback to the speaker not by evaluating what is said but e.g. by offering an interpretation and asking for clarification.

(3) Transformative listening

When I listen in a transformative mode, then as well as an awareness that what I hear may not be what the speaker intended (characteristic of the hearing of interpretive listening) I am open to change and to the interrogation of assumptions.

Evidence of transformative listening in a classroom includes a willingness to alter ideas in a discussion, to engage in dialogue, to entertain other points of view, and hold them as valid, independent of whether they are accepted or not. If a student makes a connection to a previous piece of work or links something that has been said before, this would indicate the transformation of experience, the re-structuring of categories. Similarly, if a student creates a new categorisation, this indicates a creative attention to what is happening: the seeing of ‘a new world’ (Thera, 1996 p.32).

CASE STUDY - TEACHER A

Methodology

There are four researchers on the ESRC project (one of whom is myself), each responsible for a different strand of analysis (e.g. teaching strategies, algebra).

The whole project design has been informed by ideas of enactivist research (Varela, 1999, Reid, 1996, Brown and Coles, 1999, 2000) and a key component of the research process has been that we take multiple views of a wide range of data. We will often look at one piece of data, e.g. a short piece of a videotape of a lesson, and discuss what we see from each of our perspectives.

We also tell stories of the changes that are happening over time for the students, teachers and researchers on the project. The three transcripts (see Appendix 1) that I use in this paper are part of a story about learning and about teacher change. All four researchers have written about an expanded version of the last transcript (Brown et al, 2000) weaving a different story to the one I present here.

There is no sense of there being a 'best' theory for our work or, for example, of the perspective of listening in this paper being 'better' than a previous analysis of the same data. An explicit part of the project is that we see 'research about learning as a form of learning' (Reid, 1996 p.208). From an enactivist viewpoint learning is the telling of multiple stories and the awareness of ever finer grained distinctions.

Methods used for this case study

There were four teachers on the project who were videotaped in each of the six half-terms that make up an academic year. The camera was fixed at the back of the classroom - focused on the board but with around half the students in view. The data for this study is taken entirely from the videotapes of one teacher, Teacher A (TA). I was looking at times during the lesson of whole class discussion, i.e. when there was a single conversation occurring in the room. I initially watched the videotapes and noted - at 5 second intervals - whether a student or the teacher was speaking. This record helped me identify times when students responded directly to each other or when there was significant interaction between teacher and students. I then transcribed those sections of dialogue from the video recording. I chose Teacher A for the study because, of the four teachers on the project, there was the clearest evidence of a change in listening on the videotapes of his lessons. Appendix 1 contains three transcripts selected to highlight these changes.

Analysis

The dialogue in Transcript 1 shows evidence of evaluative listening. After the comments of both S1 and S2, Teacher A says 'they do' thus evaluating and confirming the students' contributions. S3's comment is greeted with a 'thank you' which the other comments were not, suggesting to me that this is the comment that the teacher wanted (although the comment is unclear, from Teacher A's response I interpret S3 as saying something about the first and last digits of the three numbers under consideration). Further evidence for the teacher having a pre-given idea of what he wanted the students to say is that having started with the general question: 'Any comments about those three numbers?', Teacher A then asks: 'what can you tell me about the first and the last?'. Having started with an open question, since the

students were not offering what was wanted, the teacher directs their attention to a specific aspect of the problem.

I believe the listening in Transcript 2 moves from interpretive to transformative. A student makes a suggestion: 'It's got six lines of symmetry', which is dealt with in a different manner to the ones just before. Rather than continuing the interpretive listening pattern of repeating each student's contribution and asking for other comments, Teacher A says: 'Where's your lines of symmetry then?'. The teacher cannot know where S1's lines of symmetry are, hence he is genuinely involved in making meaning of the comment.

Teacher A then asks for the rest of the class' opinion: 'Who thinks it's a line of symmetry? Hands up'. After S5's comment, Teacher A gets an A4 piece of paper and starts folding it the ways S5 and then other students suggest. The teacher responds directly to suggestions from students. The task for the class (in this case deciding what is a line of symmetry and how many there are on a rectangle) emerges from the interaction of students and teacher. I read Teacher A's comment at the start of the transcript: 'right, we're talking symmetry' - which was said with a slightly higher tone of voice, as further evidence that he had not anticipated dealing with issues of symmetry. There is a feel of collaboration and participation in the dialogue - characteristic of transformative listening.

The participatory nature of discussion is even more evident in Transcript 3 (taken from later in the same lesson as Transcript 2) in which the listening is also transformative. The teacher here is not running the discussion (e.g. posing questions for students to respond to). It is the students who are asking questions: e.g. 'What would just a straight line be?'. Students are now talking directly to each other and extending each other's ideas e.g. 'S3: And a quarter times 48 is twelve'.

The transcripts provide evidence that there was a significant change in the listening in Teacher A's classroom. The listening in videotapes of lessons up to Transcript 2 was interpretive or evaluative and in all later videotaped discussion the listening was transformative, so the change appears to have been a lasting one.

CONCLUSION - TEACHING STRATEGIES

It is beyond the scope of this paper to deal with what factors have contributed to the change in listening in Teacher A's classroom, however it is striking that there are a number of teaching strategies in evidence in Transcript 2 (and later discussions) that were not being used in Transcript 1. These strategies include:

- the teacher asking a question they do not know the answer to. Teacher A says: 'Where's your line of symmetry then?' Having made this comment there is immediately the possibility for other students to engage with S1 in dialogue.

- responding to students' suggestions. There is evidence of this particularly in the sequence when Teacher A gets a piece of paper and starts folding it.

- asking for feedback from the whole class. Teacher A asks for ‘Hands up’ in response to the question ‘Who thinks it’s a line of symmetry then?’. Feedback from this response allows the teacher to use the next strategy.

- asking a student to explain their idea to the class.

These strategies can all be seen as slowing down and opening up discussion. They are strategies that encourage and allow different students to engage in dialogue with each other. In Transcripts 2 and 3 over a quarter of the class speak in a period of a few minutes. Another way of characterising the strategies is that they all depend on the teacher’s contingency upon the responses of the students. It is important to note this does not imply the teacher will do anything the students suggest but only that students’ voices can be heard and can play a part in the creation of the lesson focus.

It is striking that in Transcript 3 it is not the teacher who is ‘asking a question they do not know the answer to’, or ‘responding to students’ suggestions’, but the students themselves. It seems that students are taking over some of the roles in discussion previously performed by the teacher - a culture of transformative listening is becoming established in the classroom. In Transcript 3, for the first time on any of Teacher A’s videotapes, students raise their own questions, which they could work on, related to the mathematical activity.

1 ‘Developing algebraic activity in a ‘community of inquirers’’ Economic and Social Research Council (ESRC) project reference R000223044. Contact: Laurinda.Brown@bris.ac.uk.

Thanks to the headteacher, governors and staff of Kingsfield School for their unfailing support.

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APPENDIX 1

[NB The numbering of students in each transcript is done independently.]

Transcript 1: September 1999

TA: Any comments about those three numbers? [The numbers referred to are: 92101, 29810, 54321]

S1: They all have two in them.

TA: They all have two in them [pause] they do anything else?

S2: They all have one in them.

TA: They do [Two more students offer suggestions, which TA responds to.]

TA: Now remember what we were saying ... when we were looking at four digits we were comparing the first and the last, we were comparing the two middle ones. What can you tell me about the first and the last with those ones ... what can you tell me about the first and the last?

S3: [unclear]

TA: Thank you S3: nine is bigger than one, two is bigger than zero, five is bigger than one.

Transcript 2: March 2000

S6: It's got four sides

TA: It's got four sides, okay, very good, anything else?

S7: It's got four equal angles

TA: Four equal angles, yes

S1: It's got six lines of symmetry

TA: Six lines of symmetry, right, we're talking symmetry. Where's your lines of symmetry?

S1: Across the right hand top corner to the bottom left hand corner

TA: This is a line of symmetry? [TA holds up a ruler along a diagonal of the rectangle] [pause] he's unsure. Who thinks it's a line of symmetry? Hands up [pause] a couple of you. [pause] Who thinks it's not a line of symmetry? [lots of hands go up] Oooh, okay, S3, convince those that think it is why is it not a line of symmetry do you think?

S3: You can only have diagonals in a square

TA: Oh right, okay

S4: Or a circle

TA: Why is that one not a line of symmetry though? S5

S5: Well, if you get like a A4 paper, that's a rectangle, you can fold it diagonally so that it goes all [unclear]

Transcript 3: March 2000

TA: Excellent. Oh, lovely. Well done. [Students applaud] So, 3 times 4 is 12, 2 times 6 is twelve, 1 times 12 is twelve and a half times 24 is also 12..

S3: And a quarter times 48 is twelve

TA: And a quarter times 48 ...

S3: And an eighth times ...

S4: Three quarters.

TA: And an eighth times ...

S: I'm not saying.

S: You can actually go on.

TA: We could carry on forever couldn't we?

Ss: What about 100? How could you draw it though?

TA: Well, it would be a sixth of a unit. Very small.

S: If you drew it really big so one square was 6

S: Sir, what would just a straight line be?