International Journal of Science Education

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/tsed20

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Published online: 20 Jul 2010.

To cite this article: Susan Rodrigues & Ian Thompson (2001) Cohesion in science lesson discourse: clarity, relevance and sufficient information, International Journal of Science Education, 23:9, 929-940, DOI: 10.1080/09500690010025076

To link to this article: http://dx.doi.org/10.1080/09500690010025076

INT. J. SCI. EDUC., 2001, VOL. 23, NO. 9, 929-940

RESEARCH REPORT

Cohesion in science lesson discourse: clarity, relevance and sufficient information

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This paper discusses linguistics in the teaching of science, specifically the key linguistic processes through which students learn, rather than the mechanics of classroom interaction. Integrated datasets from The Classroom Learning Project contain transcripts of videotaped lessons spliced with teacher and student interviews and annotated with a researcher's comments. To illustrate the role of language in determining the effectiveness of teaching and learning, an integrated data set for one Australian Year 9 (14 year old students) science lesson on 'Fibres and Fabrics' was analysed in terms of coherence and comprehension. The analysis demonstrates the importance of communication skills in the classroom and the value of language analysis in determining the effectiveness of teacher's instructions. This paper argues the need for teachers to consider the importance of learning as a linguistic milieu especially when teaching science in context. When teaching and learning in contextually, competent communication must include adequate, genuine, clear and relevant amounts of information.

Introduction

The dynamics of the science classroom are dominated by language and not surprisingly over the last 25 years, educationalists (Bruner and Olson 1977-78, Lemke 1990) have become more interested in language use in science classroom interactions. This has led to a growing awareness of the processes of linguistic functions in classrooms, for the way language is constructed and used influences the sense made of a particular learning situation (Barnes and Todd 1977, Love 1994, Rodrigues and Bell 1995). Within the growth of functional systemic linguistics, discourse has been associated with executive and cognitive function (Harre and Gillett 1994, Thompson and Copolov 1998) and how conversations are constructed or made coherent in specific settings, including the classroom (Lesser and Milroy 1993, Unsworth 2000).

Halliday and Hassan (1980) comment that studies of educational discourse generally concentrate on the 'mechanics of classroom interaction'. However linguistic analysis of the pragmatics of science teaching, the social applicability of linguistics to the classroom, and the key linguistic processes by which students learn, including language and learning settings and learning negotiated meaning, is now receiving more attention (Norman 1992). This paper discusses negotiated meaning or semiotics after Halliday and Hassan (1980) and uses measurement by discourse analysis, after Hassan (1984), to demonstrate the influential role of language in classroom teaching. A series of transcript excerpts from one science

International Journal of Science Education ISSN 0950-0693 print/ISSN 1464-5289 online
http://www.tandf.co.uk/journals
DOI: 10.1080/09500690010025076

lesson is used to illustrate the interaction of coherence and comprehension in developing effective science teaching.

Linguistics and the classroom

Sociolinguistics is the study of language in social contexts and situations, of who is speaking and to what end. It therefore lends itself to the examination of language within classroom situations.

The language of the classroom may be perceived structured into statements, questions, responses and commands, or pedagogical 'moves' as 'Structuring', 'Soliciting', 'Responding' and 'Reacting' (Sinclair and Coulthard 1975). 'Structuring' is where a learning situation is established, for example, a teacher describing the topic to be addressed. Teachers may then 'Solicit' a response through questioning, commanding or requesting. 'Reacting' involves the modification, shaping and rating of moves. In most instances the discourse of 'Structuring' and 'Reacting' involves large units of text whereas 'Soliciting' and 'Responding' tend to be represented as interactive conversations.

The discourse of instruction is interactive and can be uni-directional or bi-directional. It is uni-directional when, for example, a teacher or a student explain a topic or issue. It is bi-directional when a discussion occurs. Uni-directional discourse of 'Structuring' and 'Reacting' must conform to established axioms or maxims if it is to be comprehensible. Bi-directional conversations in the classroom, of 'Soliciting' and 'Responding', need to conform to rules that involve initiation, turn taking, topic management, repair and cognitive functions of attention and memory.

The analysis of such conversations has been used to examine the initiation of utterances, the closure of spent topics, the relation of successive utterances, the role of the participants in the conversation, and who controls the interaction. These are interactive features that make conversations a collaborative achievement. Lesser and Milroy (1993) are psycholinguists who have provided a review of the application of sociological principles and rules for constructing conversations as an everyday activity. They have also interpreted the work of Sinclair and Coulthard (1975) and their descriptions of classroom discourse in a conversational model. In science classrooms, there is a pattern of teacher orchestrated turn taking (Barnes and Todd 1977, Edwards and Westgate 1987, Cazden 1988), with the teacher initiating and evaluating student comment. This pattern has been described as the basic unit of interaction in a hierarchical model of verbal interaction in most lessons (Sinclair and Coulthard 1975) and signals hierarchical power structures that exist in traditional classrooms. Mercer (1995) and Edwards (1993) have suggested that student thinking is directed by the structure of the discourse and language employed in the classroom. Rodrigues and Bell (1995) have reviewed how and why teachers have traditionally held the 'conversational floor'. They describe changes in the direction of classroom practice being related to changes in 'context', and that learning and cognitive changes occur when students step onto the conversational floor and share their context. Context here is not seen as just the physical and learning environment but cognitive representations that are altered through the reinterpretation of meaning. Language is considered the crucial agent for the understanding of learning through negotiated meaning (Halliday and

Hassan 1980) and indeed for the wider mediation of thought (Vygotsky 1934/1987, Palinscar 1998).

Systemic functional linguistics can also describe dimensions of classroom interaction in terms of the 'Field' (what happens in a lesson), 'Tenor', (the personal relations of solidarity and power among teachers and students) and the 'Mode' (the part that language plays in learning and securing relationships) (Eggins 1995, Christie and Undsworth 2000).

Selecting transcripts for data analysis

The Classroom Learning Project (Clarke 1998) is a qualitative study of learning in the science and mathematics classroom. Fifty-five classroom sessions were videotaped, one camera directed at the teacher, another at a cluster of students. A researcher was positioned in the classroom and listened through an audio-link to teacher and student conversations while simultaneously making notes of impressions of the lesson on a word processor. These notes were the basis of subsequent interviews between the researcher and students at the end of the lesson. The conversations in the lesson were also transcribed, and integrated with the researcher's notes. After viewing the video the teacher was interviewed. This interview was also transcribed and included in the integrated data sets. Interactions between students and students, or students and teachers, were videotaped, transcribed and presented to the speakers for comment and verification. These video transcripts were added to the integrated datasets. Because of the depth and breadth of information collected, the datasets provide rich data for the analysis of language in the classroom. A collation of ten parallel analyses of the data in the Classroom Learning Project is to be published by Kluwer in 2001 under the title 'Perspectives on Practice and Meaning in Mathematics and Science' (Clarke in press).

An integrated data set for one Australian Year 9 science lesson on 'Fibres and Fabrics' was analysed in terms of coherence and comprehension in order to illustrate the role of language in determining the effectiveness of teaching and learning. Students in the class were 14 years of age. The teacher indicated that the lesson was an example of teaching science in context because 'the materials and theme used were familiar to the students'. The transcripts indicate that the lesson is not of teaching scientific concepts in context because the manner, quantity and relation of the information prevented renegotiation of the semantic concepts from the everyday to the scientific.

Methods of analysis

Halliday and Hassan (1976) and Hassan (1984) have described a method for discourse analysis that measures cohesion in text. Cohesion of the internal structure of text is determined by lexical links, or ties in peoples' discourse that internally relate clauses and sentences cohesively. If these links are weak a listener will have difficulty following the speaker's intention and the boundaries of the topic will be poorly defined. The listener may, therefore, have to infer the speaker's intention. An informal conversation between speakers who share a known topic will be weaker in its cohesive ties because of assumed co-operative reference. If the links are dense the text will appear pedantic, repetitious and concrete. Conversations between people who do not share common knowledge of topic

will be more densely referenced. In general, normal speakers are 50% cohesive in their discourse (Hassan, 1984). This means normal speakers say half of what they mean, leaving the conversational partner to infer the other half through shared knowledge in context. For competent communication a speaker must also conform to the principles such as those of Grice (1975), co-operation of the maxims of quantity (giving adequate amounts of information), quality (being genuine), manner (being clear) and relation (being relevant).

The analysis of the excerpts of the transcripts provided in this paper follow the procedure used by Hassan (1984). The first textual analysis is of a paragraph in the science manual that the teacher is reading to the class. The analysis is described in detail to acquaint the reader with the internal structure of written or spoken discourse and how it may be examined for coherence. In accordance with systemic functional grammar the transcripts will be referred to as 'texts', that is, 'a passage of language, spoken or written, of whatever length, that forms a unified whole' (Halliday and Hassan 1976).

Cohesion in science lessons

Texts illustrating 'Structuring', 'Soliciting', 'Responding' and 'Reacting' during various points of the lesson are analysed below to identify textual cohesion.

Clarity in science discourse

In this section we examine discourse in science lessons in terms of the coherence of the lesson. The classroom text that follows can be transcribed into propositions or statements established for verification. They are usually expressed as sentences or clauses. In the opening sentence in text 1 there are three clauses with related 'propositions': that silk is a protein; that silk is drawn out as continuous strands by a silkworm and that the silkworm weaves a cocoon of silk strands.

Text 1:

Teacher—Silk is a protein drawn out in long continuous strands by a silkworm as it weaves its cocoon. The fine strand of several cocoons are unwound and twisted to form silk thread, which provides fabrics of unique softness and lustre. Synthetic fibres are fibres made from chemicals rather than natural sources such as animal, plants or minerals. The manufacturers can control the size, the shape, the surface and the physical aspects of the fibre. Synthetic fibres are used in clothing and are usually heat, moisture and mildew resistant, stretchable, and easy to dye. Almost all synthetics are made from petrochemicals such as oil or coal, and may resemble plastic in their chemical structures. In 1884, a Frenchman, Hillaire de Chardonnet, invented a process of treating natural cellulose such as wood pulp with solvents, and spinning the resultant liquid into fibre. Nylon, from the DuPont Company, was the first commercial fibre made wholly from chemicals. The process for all oil-based synthetic fibre is basically the same. Synthetic textile fibre can be designed to meet specific needs such as being as strong, durable and lightweight. It can be produced as an extremely fine thread such as nylon for women's hosiery or nylon stockings, or thicker glossy thread for lingerie, or even thicker again to reinforce vehicle tyres.

The text has 215 words that have been rendered into 19 propositions of 59 words or word clusters, such as 'unwound/twisted', 'silk-thread' and 'synthetic-fibre'.

- silk protein;
- silkworm draws-out silk strands;
- silkworms weave cocoons;
- cocoon strands unwound/twisted;
- strands make silk-thread;
- silk-thread makes fabric;
- chemicals make synthetic-fibre;
- manufacturers control fibre characteristics;
- synthetic fibres make clothing;
- synthetic-fibres resistant/stretchable/durable;
- petrochemicals make synthetics;
- Hillaire de Chardonnet/1884 invented process;
- process treated cellulose;
- process spun liquid/fibre;
- DuPont nylon first commercial chemical-fibre;
- chemicals make fibres;
- oil-based processes synthetic/fibres similar;
- synthetic-fibre designed specific-needs;
- synthetic-fibre produce fine/gloss/reinforcement-properties.

Certain words, or lexical items, recur in the text and their relationship maintains relevance in the text. Of the 59 words, there are 48 words which are related and can be grouped into 10 categories; 'silk', 'silkworms', 'cocoons', 'protein strands', 'synthetic fibre', 'molecular compounds', 'fabric', 'fabric characteristics', 'manufacturers and inventors' and 'production processes'. This means that there are 11 words that cannot be grouped into the categories and they are peripheral to the text. The text will be more coherent if there is a lower relation of peripheral words to related words. This makes sense, the less irrelevant verbiage in our conversations the more clear will be our spoken intention to a listener. The interaction of the relevant words in this text about synthetics and molecular compounds given as cellulose, chemicals and petrochemicals develop the theme of the nature, invention, and processing of fibres. In 40 cases these interactions are linked together by lexical referents. It is this internal linkage of ties that bind the text into a cohesive whole.

The degree of cohesion, or the Cohesive Harmony Index (CHI) is determined by taking a percentage of number of words that interact together (40) divided by the number of total words rendered from the original text (59). In this case the text is 67% cohesive, high, but not unusual in written rather then spoken texts because of language formality (Eggins 1999). The text is both cohesive and coherent

The text also conforms to the maxims of truthfulness, adequacy of information, clarity and relevance. The propositions are either self-evident factual statements or at least they have a verisimilitude in that they are apparently true. The reason the text is clear is because of normal range of the CHI. The text is also adequate and relevant in its information. It is relevant because the ratio of related words (48) to peripheral words (11) is almost 5:1. The theme of the text is the production of synthetic fibres. The reader will note that the text begins talking about silk and silkworms. This acts as an introduction to the main theme of

synthetic fibres. So the silk/silkworm words remain relevant to the theme even though they do not interact with the entire text.

Text 2 is the same teacher during a 'Soliciting' for 'Response' move about 'woollen fibre' and text 3 is a 'Structuring' move; both are abnormally cohesive, and consequently less comprehensible. The teacher is in control of the conversational floor and the students 'Respond and Repair' appropriately when selected as the next speaker. The mechanics of the interaction also indicate that the task is 'closed' in that the teacher is controlling the conversational floor by directing the students to a required response.

> Text 2:
> Teacher—Wool, the long fine hair from sheep, is the most important animal fibre. The fine under hair, now you know that live animals have got the outer hair and the under hair, the finer layer that lies close to the skin, the fine under hair of the Angora and the cashmere goats, the Angora rabbit, the camel, the alpaca—I know some people who already mentioned these names—and the vicuana, or vicuna, I should say, have a special softness and often high bulk as in mohair, like it's very bulky. If you look at it under the microscope you can see the various sizes of the fibres. Now I've got a friend who lives on a farm in the Riverina, and when they go and shear the sheep, they actually, he's actually a wool grader. And what he used to be able to do, and he's very good at it, is he will take a hunk of the sheep, of the sheep fur, take a certain amount and width, and then he would simply feel it with his fingers and from that he could grade it into various parts. So they're so skilled that by looking at it, seeing how elastic it is, and uh, having a feel of the fibres they can say whether it's this grade or that grade. What type of sheep tend to have the most expensive type of wool? What's the name of the special sheep?
> Student—Alpaca.
> Teacher—No, I don't think alpaca's a sheep. Starts with 'm'?
> Student—Mohair?
> Teacher—No, it's not mohair. M-E-R?
> Student—Merano?
> Teacher—No. Merino. Merino wool, and Australia's very famous for its merino sheep.

A reader would assume the topic and theme of the teacher's discourse would be the grading of fine fibre. Certainly the teacher's text conveys five propositions:

1 wool is the important fine fibre of the sheep;
2 there are outer and under layers of wool;
3 fine wool is bulky yet soft;
4 fine fibres are imaged under microscope;
5 the teacher has a farmer friend who shears sheep and grades wool.

However these propositions are not clear in the text because the text is redundant. There are 239 words that can be lexically rendered to 61 total words. Of the 61 words 48 are relevant (13 are peripheral) and 40 of the relevant words interact. The CHI is therefore 40 divided by 61 and percentaged to 66% which is dense for a spoken text. The text is laden with repetitious references to 'wool' on sundry 'animals'. It also falls into two halves. One is to do with animals and fine wool,

and the other to do with farmers and grading by an extraneous introduction to a 'friend who farms the Riverina'. Again the text is heavily repetitive about wool qualities, grading and even expense. Finally the sentences are complex, all but the last two, and the sentence with a reference to a microscope in the body of the text, have subordinate clauses. The students, therefore, must hold the main clause in working memory while the speaker generates extraneous clauses before concluding the sentence.

The students' confusion is apparent by their failure to answer a question that is a non sequitur about the name of a breed of sheep and not about fibre. In short, following 239 words of text about underhair in sheep, goats, rabbits, camels and alpacas, vicuna, cashmere goats, microscopic fibres, a friend that can grade wool for its dimensions and elasticity, the teacher solicits a confused response. The text is an example of breaching the maxims of Grice (1975), for the quality of a text about the amount of information and its patency, clarity and relevance.

The relationship between relevance and discourse

Text 3 is 'Structuring'. The teacher is explaining how to answer questions and how the lesson should be written up as a practical. The discourse then becomes bi-directional as students contribute to the dialogue.

> Text 3:
> Teacher—I'd like you to circle those seven questions, very easy, very quick to answer. At the bottom of page 5 I'd like you to put question 8, question 8, and could you say PTO, for turn over. If you turn over to page 8, there's a table that you will need to copy and—oh, sorry, page 6, question 8, you'll need to copy and do. Now, throughout this book, there are a series you virtually have to have together, a number of research questions of this, of which this forms the first eight. Fairly easy, and there's really not much that you should have any trouble with at all. OK? There is just one, question 3, could you underline the word 'husks' H-U-S-K-S. Underline that, that's about the only thing that might, question 3, underline the word 'husks.' The other thing is that they do ask you to write up a full practical report for a number of pracs. I'd be quite happy for you to write up the first one in full detail, which means you've got to write the method out. If you do a really good job of that, I won't ask you to write up the next prac. For those of you who do not write the first one up properly, I will be asking you to write it up, every prac up fully until you actually give me a really good prac. So if you do the first one really thoroughly and well, then I'll just ask for the short method during lesson time.

In this text there are 262 words and a reader may well assume it is less than coherent. There are only three propositions for this number of words: the questions to be answered, underline a word, and write up the prac. The density of referencing in the text caused by repetition and revisions confuse both a reader and the students. Repetition can be legitimate elaboration, where the text is concentrated to avoid misunderstanding. The result here is that the students do not understand their teacher. After 'Structuring', the teacher continued the lesson.

1. Teacher—And circle A to ungraded.

2. S1—I think we're on the wrong page.
3. Teacher—Detailed report, loose-leaf. And graded.
4. S1—Detailed.
5. Teacher—Right. Question one.
6. S1—Is it on that page?
7. Teacher—Yes, 21.
8. S1—Yes.
9. Teacher—Yes. Underline.
10. S2—What's the date today?
11. Teacher—Underline that, underline 'loose-leaf.'
12. S2—What's the date today?
13. Teacher—I think it's the 16th. On question one, underline the word 'characteristics'. In other words, what things are necessary for plastics to be able to be recycled.
14. S1—We have to underline a lot, don't we?
15. Teacher—Question two, underline 'explain the process.'
16. S1—Why? How many do we have to?
17. S3—Two.
18. Teacher—Right, number two. Explain the process, circle the word 'one.'
19. S1—I dread it.

There are 19 conversational turns between the teacher and students. Of these, 10 are student comments and six of these disturb routine conversational acts. Three (turns 2,10,12) are students introducing extraneous topics on dates and pages, two (turns 14 16) are a transgression of the teacher's turn as a student aside, and one (turn 19) is a distortion, being a reference to another topic.

The mechanics of the interaction seen in text 3 indicate that the task is closed in that the teacher directs the students to a required response. The role of underlining was clearly important to the teacher who, reviewing the tape of the lesson, made the comment:

> The underlining is also to try and highlight to the students what is going to be important for them to learn as they go through the unit, and the terms of properties and compares are used so much in testing and you know the language that we use to test and evaluate students that the sooner that we can try and get them to understand the meaning of it the better. But it is really sad if we say 'evaluate' or 'compare' in a test and the students don't have a very good understanding of it then they can't do the test question particularly well because they don't understand our language. So it is part of introducing the language associated with science. And also again trying to model it, so if they don't understand something they can write the word above, or they can highlight it so it just doesn't become a meaningless sea of words that are quite often too difficult for kids to understand.'

The lesson transcript indicates that students did not understand the purpose of the underlining, nor what they are supposed to underline.

> Teacher—Yep, I'd underline 'clothing industry' and the word 'use.' And it should be pretty easy for number five.
> S1—Define?
> Teacher—Sorry?
> S1—Define.
> Teacher—Yes, but define what?

S1—Um, polymer.
Teacher—Yeah, polymer and?
S1—And monomy.
Teacher—Monomer.
S1—Monomer.
Teacher—Yeah, monomer. OK, number six please, Stewart?

After the lesson the researcher interviewed S1 as they watched the video of the lesson. Their conversation indicates S1's confusion:

S1—Um, you have to underline. . . . And I, choose define. 'Cause that's what I thought was important. . . I would have thought it was define 'cause I, it was just underlining monomer or whatever—it didn't mean anything . . . Monomer meant nothing.
Researcher—So which did you underline?
S1—I underlined the define. And then, but when we do do that, she's done that a couple times, but then we have to say it, um and she goes through it, saying 'OK, you should have underlined, this, this, this, and this' and most of the time I haven't underlined the things that she wants me to, but when I do I don't understand, what.

Nature of the information and discourse

This paper has also raised the issue of learning in context being a re-negotiation of meaning. Children and adults learn informally about the world around them from their physical and social, both peer and cultural, communicative environment. The meanings they derive are therefore inexact or wrong when lay meanings are read for scientific language. Common examples of this include terms like 'acid rain', a 'hole in the ozone layer' or 'genetic engineering'. It is the role of the science teacher to take the lay interpretation and redefine it semantically into a scientific definition. Although polluted rain may contain diluted sulphuric acid it may be better described as acidic in chemical composition. There is not a 'hole' in the sky in a literal sense. 'Genetic engineering' is a coloured term out of the context of the semantics of science, all living things are constantly being genetically re-jigged.

The social negotiation of meaning, as well as the adequacy of our understandings in our world is crucial to the viability of our construction. As our experiences develop so do our personal constructions, although personal constructions are not always viable, complete or necessarily stable. What we consider plausible, believable and acceptable in one environment may not work comprehensively in another, but until these constructions become useless or limited, we continue to hold on to them. Nevertheless, these propositions, as scientific knowledge are currently the best ideas we have.

The learner's goal, the situation in which they find themselves, and their determination of the adequacy of their existing understandings, are critical factors in accepting current scientific propositions for developing ideas which take into account accepted science understandings.

The transcripts of the lesson on fibres demonstrate that this re-negotiation of meaning did not occur. In this lesson the students had to construct a long list of fibres and read them to the class, and once this was done the task was deemed completed. There was no discussion on the nature of fibres within the lists that

might have led to re-classification, categorization and therefore re-definition of concepts. The students remained confused about fibres, fabrics and textiles.

S1: They're clothes.
S2: Huh?
S1: They're clothes.
S3: No they're *in* clothes. They're not clothes.
S4: Like you make stuff, they're not.
S2: [writing] In fabric.
S3: Yeah, in fabric.
S4: Fiona.
S1: There's a weft and a warp.
S3: [laughs]
S1: A weft and a.
S4: [patting J on shoulder] We're not in textile class today.
S1: Yeah, that's what a fibre is, isn't it?

The difficulty was compounded by the imprecision of 'fibre', in that the word was interpreted differently in cereals and clothing. This is not a rare phenomena in science lessons, for example, 'reduction' is interpreted differently in everyday use and science classrooms. Similarly 'cells' has a different use in human sciences and physical sciences as well as everyday life.

S4: Everything has more than one meaning. [nods]
S2: Yes. [writes]
S4: Like Fibre Plus.
S1: No, like Nutrigrain and that.
S4: Yes. [laughing] Like fibre.
S3: No, that's different fibre.
S1: How do you know, they could be talking about fibre in your body.
S4: Except for the fact that she isn't.
S2: Hey, do you realise, right, to find it like we've used information from other classes, in that one and we are.
S3: Right here?
S4: [makes weird noise]
S2: You just said textiles, and I said fibre from home etc.
S1: You don't say that it's um that fibres are in food because we don't know that she's talking about clothes fibres, she could be talking about—
S3: No, she isn't talking about fibres.
S1: How do you know?

These insights were not publicly shared with the teacher or students in other groups. Closed teaching does not allow for such negotiation of meaning. The opportunity to tap into the students' existing knowledge and establish links to science and the materials theme were stumbled upon by the students. The students (in the classroom transcript above) identified links to other areas of their life experiences, however without a teacher's guidance they were unable to make the distinction between fibres and fabrics. Furthermore they were distracted by the goal of the task: to make a list. The goal was to obtain the longest list and that, at least, the students realised from the onset of the task.

Meaningful teaching and learning science in context does not happen just because familiar materials are used.

> S1—I go into class and sit through the class, then come out, then it's all forgotten.
> Researcher—Yes?
> S1—And then I go back into class. I listen and I remember it for next class but I don't think about it in between all the classes. I switch into science when I'm in science, then I switch out of it as soon as it finishes. Then the bell goes.

Conclusion

It is classroom dialogue that enables students to engage with meaningful scientific language, even when the materials and themes of topics are familiar to students. During the interview this teacher provided valid justification for each of the tasks presented in the lesson. However lack of the cohesiveness of the language used, the nature of the information and task itself meant that most of the students did not comprehend either the science involved or the need to undertake the task, and they did not seek clarification. In consequence, even though the materials were familiar to the students and the theme was common, the pattern of communication rendered the lesson limited in terms of providing a more effective context in which to learn science.

Teaching and learning occurs in classroom settings where both teachers and students learn by negotiating new meanings through linguistic frameworks. The context in which this happens is more than the physical setting of the classroom, or even the topic to be addressed. Context is the semantic knowledge of students, which, through education, is expanded and made more precise in definition.

Linguistic analysis of discourse may be a valuable tool to assist both teachers and students to improve their exchanges in a learning milieu. It also has a valuable role in assisting teacher educators to provide clear guidelines and expectations for student teachers when exploring their own teaching practices. Dysfunctional classes may be a consequence of poor communication skills rather than inadequate management.

The texts in this paper illustrate that the language of instruction needs to be coherent, adequate in information, truthful, clear and relevant. Teachers would agree that their discourse needs to be unambiguous, relevant and coherent. Linguistics has much to teach teachers in the art of teaching and the nature of learning. Advocating simplistic prescriptions of teaching and learning in the use of thematic material as a means of teaching and learning in context demonstrates a failure to understand that teaching and learning exists in a linguistic framework and the resultant development of shared knowledge. Teachers need be sensitive to their conversations with students and to surrender conversational power by developing a shared understanding of the topic and theme in classroom conversations.

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