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INTRODUCTION

RESEARCH CONTEXT

Over the last fifteen years, increasing attention has been paid to the value of encouraging children to talk, with each other and with the teacher, to help them in their construction of new knowledge in the classroom. The theory underpinning this is that of social constructivism, a theory of learning which places the child centre-stage. Important in this theory is the child's social communicative interaction with others. This study looks at the way in which a computer database provides the context which allows learners to use language collaboratively to help in their joint and individual construction of knowledge.

The theory of language held in this study is a sociolinguistic one, so that development is seen in terms of the acquisition of communicative competence, which itself depends on the interaction between two or more people in a given socio-cultural context. At the risk of oversimplifying, it is to say that children acquire language by using it. It is a functional approach.

RESEARCH FOCUS

To be specific, this study hopes to show, by detailed analysis of the children's discourse, that the computer, running database software to help the children solve a given task, provides a context which maintains and structures the children's discourse and helps it to proceed in a

collaborative manner thus helping them in their construction of new knowledge.

THE RESEARCH METHOD

Details of this are contained in the section on Methodology, but, in outline, the research method adopted had in mind the strictures of Stubbs, who believes that research of this kind should be,

"based on naturalistic observation and recording of language in real social situations."
(Stubbs, 1983, P.140)

As such it lies in the ethnographic tradition, i.e. observation of the children in a situation as close to the normal classroom as possible.

IMPORTANCE OF THE RESEARCH

The importance of this research lies in its attempt to show by detailed analysis of the children's talk, how the computer may provide a context for the children's discourse, and which language uses are encouraged by this.

TALK IN THE CLASSROOM: The Literature

A SOCIOLINGUISTIC VIEW

By the end of the Eighties the importance of developing children's oracy skills had been given official recognition in the Cox Report. Pupils were expected now to show:

"an increasing ability to function collaboratively, e.g. involving others in a discussion; listening to and giving weight to the opinions of others; perceiving the relevance of contributions; timing contributions; adjusting and adapting to feedback."

(DES and Welsh Office, 1989, para 15.16)

This is to see language as,

"a central, pervasive and complex aspect of an individual's interaction with the social world."

(Study Guide, p.9)

It is a sociolinguistic view of language where language is used to interact in a social world, a given culture. Language is here a "social and cultural phenomenon." (Kress, G., 1985, P.136), a "cultural resource for social interaction", (Wells, G. and Nicholls, J., 1985, P.5.) Exchange, of views, ideas and values forms a central part of this theory of language.

Wilkinson stresses this when he says,

"...if the word `communicate' implies only passing information from A to B then this is a superficial answer."

(Wilkinson, A., 1975, introduction.)

That is, communication is an interactive process.

This social interaction with others is also at the core of recent developments in the understanding of children's learning which has moved away from a Piagetian view of the

child as a "lone cognizing organism" (von Glaserfeld, 1989)
to one where

"most learning in most settings is a communal activity, a sharing of culture."

(Bruner, J.S., 1986, p.127)

The work of L.S. Vygotsky is central to these developments. Here, language and thought come together to create a cognitive "tool" for human development where,

"Children solve practical tasks with the help of their speech, as well as their eyes and hands."

(Vygotsky, L.S., 1978, p.26)

This view of the social construction of knowledge by communicative interaction with others is central to this study.

TEACHER-PUPIL TALK

Talk in the classroom may be broadly divided into that between teacher and learner and that between the learners themselves. In this study the overwhelming bulk of the talk is between children working in small groups at a computer. Before examining the literature relating to this it is worth noting briefly that, in "promoting children's talk development [...] whole class discussion is not a solution", (Phillips, T., 1985, p.64.) Phillips cites the asymmetrical nature of such dialogue, where the teacher does most of the talking, as one reason for this.

Edwards and Mercer in their study of teachers and learners

jointly constructing "common knowledge" reveal some of the dilemmas which arise for the teacher when she is in control of the talk in the classroom, no matter how unobtrusively. They note that in this situation,

"Pupils have to divine as best they can the unspoken and implicit ground rules of the system, and must learn how to extract meaning from the teacher's hints and clues, how to play the classroom game."

(Edwards and Mercer, 1987, p.168)

They also reveal that, "the creation of successful discourse is problematical", (ibid, p.161), partially because of the difficulty of developing adequate contexts for talk, and that the "teacher-child asymmetry of power" makes the eventual "handover" of control of knowledge from teacher to child also "problematical". Thus, if it is wished to develop children's discourse, and through this their construction of new knowledge, then teacher-child dialogue may be an inappropriate context in which to do so.

CHILDREN TALKING TOGETHER

Studies which look at children talking together vary in depth of coverage and show differing perspectives. They include work by Tough, (1976, 1977a, 1977b, 1979, 1981); Martin et al (1976); Chilver and Gould (1982) and Salmon and Claire (1984). However, if we are seeking to look closely at the ways language is used by learners talking together, then the work of Barnes and Todd (1977), Phillips (1985), the APU (1984a, 1984b, and 1987), Hoyles (1985) and the National Oracy Project (Kemeny, H., 1990) seems particularly useful in

demonstrating possible approaches.

The NOP concluded from observations in "hundreds" of schools, that children talking together use talk to explain, clarify, explore, describe, sequence, predict and hypothesize, reason and argue, narrate, persuade, summarize and re-order, evaluate and reflect.

The APU developed a functional approach to assessment where the notion of communicative effectiveness was seen as offering a broad view of competence which,

"recognises the diversity of language use according to speakers' purposes, and the communicative versatility which is needed to meet the demands of different situations."

(MacLure, M., 1988, P.302)

They revealed many categories of language use, but, as with any taxonomy, this collection is open to criticism. In particular, MacLure notes that one of the categories, "collaborative discussion", might include within it several of the other functions, such as persuading, informing or speculating, (MacLure, M., 1988, P.303-4). Thus, in this study there is an attempt to more closely define the language uses involved in "collaborative discussion." (See Methodology.)

Barnes and Todd, in their 1977 study, investigated "the talk of thirteen-year-old boys and girls, recorded while they were working in small groups on tasks which their teacher had

set." (P.ix) The descriptive system they used distinguished four functional components of speech, on two 'levels' and in two domains, the interactional and the cognitive. Each function was further sub-divided.

Of their categories, they had doubts about whether they did in fact, "conserve those features of the children's talk which we see as theoretically important." (P.18) Further, and very importantly, in assigning meaning to utterances they identified two main difficulties. The first was that a great deal could go on in just one utterance and therefore utterances could not be put into categories on a one-to-one basis, and secondly, that meanings for what is going on in the conversation are constructed not from one utterance but from cycles of utterances. (This is recognizing that in discourse there are higher levels of structure than the sentence, as Sinclair and Coulthard, 1975, did in their work.)

Whilst recognizing these and other limitations to their work they did believe that their research showed that small group talk had the exploratory character necessary for personally meaningful learning, and that it was only by thinking aloud, acknowledging uncertainty, formulating tentative ideas, comparing interpretations and negotiating differences that learners could shape meaning for themselves and others.

Phillips also created a taxonomy to help him detect the different kinds of talk that happen in peer groups. He was trying to identify what small group discussion offers to the children and, in particular, how it helps their language development, (Phillips, 1985, P.68). He analysed the talk of 10-12-year-old children, finding five "modes" of talk. These modes were: the hypothetical; the experiential; the argumentational; the operational and the expository. As Barnes and Todd did, Phillips noted there was no one-to-one correspondence between specific words and a speaker's intention, (P.73). He also revealed that 10-12-year-olds were able to organise their conversation cohesively without it ever becoming necessary for any individual to take charge, "either by dictating an agenda or by prescribing the language and discourse strategies to be used." (P.73)

Exploratory talk and reasoned argument are particularly valued in the research examples noted above and also in more recent work by Phillips (1990). It is hoped to show in this research that these forms of talk are a particular feature of the discourse of children working around a computer.

CHILDREN TALKING around a computer

There is much anecdotal literature on the language of children using computers, but more detailed attempts to classify and/or assess the ways children use language whilst working around a computer are more scarce.

In the studies which exist, the computer is often seen as providing a "stimulus" and a "focus" for talk. See for example, Straker, 1989, P.129 and Govier, 1989, p.5.

Chandler reinforces this view. Talking about children using a computer database he believes,

"It is in the `linguaging' rather than the use of the computer as such that real learning takes place: enabling children to talk and write together."

(Chandler, D., 1984, P.55)

Straker gives us more detail when commenting on programs which require collective decision-making. Here the children must,

"think clearly, express themselves effectively, listen to each other and take into account alternative viewpoints."

(Straker, A., 1989, P.129)

Although talking about computer simulations and adventure programs rather than databases which are the focus of this study, Wray notes that these types of program may encourage children,

"to make predictions, test hypotheses [and] sustain logical arguments."

(Wray, D. and Potter, F., 1985, P.3)

Chakera expresses similar thoughts, (Chakera, E., 1984, P.161.), whilst Chandler, talking of simulations, believes they have,

"the potential to focus discussion on a shared experience without intervening and controlling the shape and language of the discussion as teachers almost invariable do."

(Chandler, D., 1984, P.24.)

Sawford notes this also, when she says, "The computer is 'in front'", i.e. it is not the teacher who is controlling the discussion. Also,

"The speed and flexibility of the computer means that each group can discuss, decide and work at its own pace.",

(Sawford, J., 1989, P.44),

and, "reasoning, cause and effect, and speculation were evident." (P.22)

The argument here is that children can explore the experience using the language with which they are most familiar, their own, and that they are freed from the more formal asymmetrical dialogue of the classroom. This was something that Papert believed happened with children using the computer language, LOGO. (Papert, S., 1980.)

More formal evaluation of claims like these above, may be seen in work by Hoyles, (Hoyles, C. et al, 1985). The study looked at pairs of children working together at the computer using LOGO. To assess their language the study developed

"categories of cognitive collaboration." Conclusions of the research included evidence of a qualitative development in the pupils' collaborative skills. However, in a later work, Hoyles revealed that,

"the dynamic interaction with the computer and the ease with which disputes can be resolved by action, factors which undoubtedly stimulate discussion, also tend to mitigate against the reflective elaboration of a pupil's arguments."

(Hoyles, C., 1989, P.128)

Some of the case studies reported by the National Oracy Project also noted under-representation of uses of language involving evaluating, persuading, reassuring and extending ideas, (Kemeny, H., 1990.)

The teacher's role in computer-mediated discourse moves away from explicit control and direction to that of organising a context for children's discourse and learning, a move reflected in Somekh's work (1989a, b) on the Pupil Autonomy in Learning (PALM) Project, and in Scrimshaw's "shaping" of the child's learning experiences, (Scrimshaw, 1989).

CHILDREN USING DATABASES

Underwood and Underwood noted the development of "self-esteem" in children using a computer database. Also, and importantly in our context,

"One of the changes that has been apparent [...] has been the subtle shift in the social order or power structure of the classroom."

(Underwood, J.D.M. and Underwood, G., 1990, P.165)

And,

"One reason for using information-handling packages in the classroom is to encourage the children rather than the teacher to ask the questions."

(ibid, P.67)

Underwood and Underwood have a final, relevant point to make,

"It is in [the] role of support facility that information handling packages such as the [...] database are seen as most useful."

(ibid, P.63)

This is to make the point again of the computer providing a supportive context for talk and shifting control of the learning experience from teacher to child.

Specifically on databases, Chandler notes that these help children to develop, "a more systematic approach to problem-solving," and that they can provide a "framework" for effective learning, (Chandler, D., 1984, P.55). Millum also notes that children's use of databases provides an "effective means of focusing on precision in language." (Millum, T., 1992, p.45.) And, in passing, he believes that, "I.T. facilitates collaborative work." (ibid, P.49)

Lynch, (Lynch, W., 1991), noted that databases of imaginary information may create an environment which "promotes oracy" (P.78) and that "the public nature of the work displayed on the screen means that collaboration is far easier." (p.5)

These accounts seem to indicate that the computer has much to offer in providing an environment or context in which the children have to use language to make progress through a task. This study hopes to show which language uses are encouraged by a database.

METHODOLOGY

COLLECTION OF DATA

Romaine makes two points which are generally relevant here,

"there can be no question of choosing one method which will be universally the 'right' one. Methodology can be evaluated only within the context of some question which one wants to answer."

and,

"Ideally, a research programme should incorporate complementarity of methods in order to look at the same phenomena from different perspectives."

(Romaine, S., 1984, P.15)

In this study it was decided to record, on both audio and video tape, the dialogue of small groups of children using a computer database with a teacher present in the room intervening only when thought necessary or when requested to by the children. The audio and video tapes were then examined and sections thought to be valuable for analysis were transcribed. Details of the children, and their school are contained in Appendix 3. Group size was that in which they were used to working (threes or fours.) The literature confirms this as probably the optimum size. Groups were friendship, single-sex groupings to avoid boys possibly dominating the groups as the literature suggests may occur.

This type of research, in a "naturalistic" setting, is more in the ethnographic tradition than that of the classic experiment. It fulfils the ethnographic criteria that "observations are contextualized" and that "the process of

observation and inquiry must disturb the process of interaction as little as possible", (Spindler, 1982, pp.6-7, quoted in Romaine, S., 1984, P.31), but doesn't meet the demand that observation should be "prolonged and repetitive."

In this study, given the very restricted time available, a deliberate choice was made to use only one method of data collection, so that there would be time for careful and detailed analysis of that data. This does, of course, leave the research open to the criticism that it views the situation from one perspective only.

THE SYSTEM OF ANALYSIS

From our earlier consideration of language, it seems that the system of analysis should seek to reveal the ways in which children use language collaboratively to make progress through their task and create new knowledge when using a computer database.

The system attempts to define categories of collaborative discourse which it is believed help to show that the children are in fact working together in their construction of knowledge. The descriptive categories are those the children were observed to use and which seemed particularly valuable in maintaining discourse. In devising these categories the work of Barnes and Todd (1977), Hoyles (1985) and Phillips (1985) helped provide particular guidance, whilst the work of

the Assessment of Performance Unit and the National Oracy Project was also borne in mind.

In constructing and using the category system several other points were noted. Firstly, it isn't sufficient to look only at individual utterances. Meaning is often constructed from sequences of utterances and one utterance may fulfil several different roles. (Sinclair and Coulthard recognised that discourse is made up of Transactions, composed of Exchanges, which are themselves composed of Utterances made up of Moves sub-divided into Acts, (Sinclair and Coulthard, 1975)). So, to consider only utterances is plainly inadequate. Mercer et al (1991) have taken this approach in their Spoken Language and New Technology (SLANT) project, placing the emphasis on "interactional sequences of talk, rather than on single utterances."

Further, the children's construction of "communal shared knowledge", (Edwards and Mercer, 1987, P.44), is not necessarily a matter of language alone.

"It includes all sorts of non-linguistic shared experience, assumptions, perception and understandings that may not be easily stated linguistically."

(Edwards and Mercer, 1987, P.44)

So, any descriptive system based on categories of language use can only reveal part of what is going on. This is to follow on from Barnes and Todd who noted,

"... it often seems that the features which are most visible, most readily isolable, are those which are least important; whilst those features which the observer focuses on as being most significant are precisely those which are hardest to categorise in a reliable way."

(Barnes and Todd, 1977, P.17)

Use has been made of Barnes and Todd's Initiating, Eliciting, and Extending moves as a way of viewing the overall structure of the children's discourse. This is to recognise that discourse is cyclic in nature, (Bellack et al, 1966, Sinclair and Coulthard, 1975, and Barnes and Todd, 1977.) Within these moves, have been incorporated those discourse skills seen as valuable in the terms outlined above. The system devised is shown in Appendix 1.

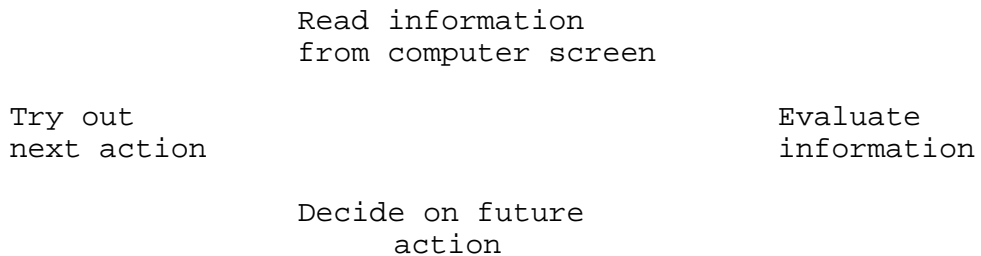
THE CHILDREN'S TALK

EXCHANGING AND INTERACTING

This analysis attempts to reveal:

- a) what the children did;
- b) how they used language to do it;
- c) how the computer supported them.

A clear, cyclical way of working emerged that was in essence the same in each group. It may be represented as below.



Much collaborative language was involved in "evaluating information" and "deciding on a future course of action". The computer played little part in these exchanges but was there as a reference if needed.

The children used language, in ways shown below, to communicate and exchange thoughts with others thus helping them in their joint construction of new knowledge.

Our notion of communicative competence involves the children being able to communicate with each other in an effective manner in a given context. To do this they have to structure their own dialogue. Someone has to initiate the discourse and then, if communication is to occur, this initial gambit has

to be extended into coherent dialogue, a dialogue which helps them to achieve their goals. If this happens then the conversation will be more than just a sequence of unrelated utterances. Discourse skills observed and thought important are listed in Appendix 1. The ways in which the children used these skills to construct common knowledge are exemplified below.

INITIATING DISCOURSE

Much dialogue could be viewed as being initiated by computer as it displayed information for the children to talk about. The usual strategy was for one or more of the group to read aloud what was displayed on the computer screen, in this way bringing it into the public arena for discussion. Also, group members could highlight those parts of the information they felt to be relevant to their aims, in essence focussing the groups attention and inviting their views on the importance or relevance of this information. Take this short example from Group 2.

- [1] M:[*Reading*] "I heard Drogon talking to an evil, yellow-scaled creature."
- [2] F: Well that must be, errr....
- [3] D: That must be Faldor.
- [4] M: Faldor.
- [5] F: Faldor.
- [6] D: Faldor.
- [7] D: Probably Faldor.
- [8] M: Because he was the yellow creature.
- [9] ?: He was...
- [10] F: So, then. So then let's go to "Land".

Here Martin initiates conversation by reading aloud information from the computer screen. [1]. It is very short

but provides a focus for the others in the group to evaluate and interpret. After Martin's opening move, Fayaz extends the dialogue by suggesting who the "yellow-scaled creature" might be. [2]. The closeness of their joint construction of knowledge is seen in [3] where Dominic finishes Fayaz's incomplete suggestion. In utterances [4] to [6] the group support this suggestion, but without giving any supporting evidence so that the suggestion is still tentative. It takes Dominic's qualifying move in [7], "Probably Faldor", to make this tentativeness explicit which in turn may be seen as prompting Martin (who initiated the discourse) to justify, in [8], the group's suggestion of "Faldor". The group seem to accept this when Fayaz suggests the next action they should take. [10].

A slight variation of this overwhelmingly predominant initiating move is one where the speaker, after reading the information, explicitly asks the other members of the group for their interpretation and evaluation. This is seen most clearly in group 3's dialogue.

- [1] C: *[Reading]* "The Orb is mine. My followers have taken it." What about that then? *[To the other two.]*
- [2] C: So, Eye-Ess, right, servant of Drogon, made a statement, "My servant helped me." Does that mean Eye-Ess has another servant? *[To the other two.]*
- [3] C: "My servant helped me." *[The other two look at her here.]* He's the servant of Drogon so that means Eye-Ess has got a servant. *[Tentatively.]*

As well as highlighting the information she sees as important

by reading it aloud, Clare also offers her reasoned interpretation of this new information for the others to consider. This explicit eliciting of information was not a predominant way of working.

In subsequent discussion, most initiating moves are reworked by the groups, who jointly may suggest interpretations, justify such suggestions, qualify them, disagree with them or reject them. Disagreement and rejection were rare. It is this exchange of ideas and views leading to collaborative construction of knowledge by the group which is seen as evidence of effective communication, and which is treated more fully in the section on Extending Discourse below.

Another important point to emerge from both these initiating moves is that the computer is closely involved in the initiation of discourse. If the computer is regarded as another member of the group, then the great majority of conversations are initiated by it as it supplies information from the database for the children to evaluate. In this way it could be seen as fulfilling a role very similar to that of the teacher. Yet, although it may be seen as initiating many sections of discourse it doesn't do any more than precisely that. It provides a structure and context within which the children work, but it doesn't manage the subsequent direction of the dialogue as a teacher very well might. The children themselves must take responsibility for that. It is their

ability to sustain the conversation that is important.

EXTENDING DISCOURSE

The children followed initiating moves with a series of extending moves. These were characterised typically by one of the group stating their interpretation of the displayed information which was then either supported, qualified or disagreed with by the others, or, sometimes, a new interpretation would be suggested without explicit discussion of the previous suggestion. Of most value, it is suggested, were those extending moves which were qualified or justified by the children bringing in supporting information, i.e. reasoned argument. This often helped the group to resolve their next course of action. Here is an important point: the group have to arrive at a satisfactory interpretation of the information they have gathered in order to make progress through the task. The computer does not prompt them in any way. They are in control and must decide what to do next, a decision arrived at through dialogue.

Suggesting and justifying

Suggesting strategies to follow, or interpretations of computer-presented information are both uses of language which were most frequently seen. They opened up opportunities for the children to justify, qualify, support or disagree with the speaker's suggestion. Because of this close association between suggesting and justifying strategies they

are considered together here. Group 1 provide an example of "suggesting an alternative strategy."

- [1] D: Right. What does Vena say?
[2] B: Don't know yet.
[3] B & L: Enter.
[Telling Amanda to press the Enter key to finish the query off.]
[4] (?): All Right.
[5] D: Drogon.
[6] B: *[Reading]* Drogon often goes to the mountains / Vena looks human.
[7] D: Just//Oh Yeah.
[8] L: Elena.
[9] A: So that's/ so that's...
[10] D: *[Reading]* Drogon often goes to the mountains.
[11] A: So, why does he not think it's that if it, erm, she's put "Drogon often goes to the mountains."?
[12] L: Oh. Vena looks human, her jog, *[mispronounces]*, job is...
[13] D: Maybe it says some more if you go down here. *[If you try to scroll further down the screen.]*
[14] (?): Yeah.
[15] (?):No.
[16] L: Well. Go and have a look at Elena because she might have something to say about Vena.
[17] A: Why. What...
[18] D: Yeah. Because her job is to protect Elena.
[19] B: Oh aye. Yeah.

In this extract, Danielle suggests that they may find more information "if you go down here." [13]. This prompts both support, [14], and disagreement, [15], but isn't developed any further. However, Lyndsey's suggested strategy in [16] is of more value in discourse terms, in that she justifies her suggestion with additional information, "...because she might have something to say about Vena." The suggestion is further reinforced when Danielle adds a further justification in [18] which is supported in Beverley's "Oh aye. Yeah." The group

then show acceptance of this strategy by entering a fresh computer query to implement it.

The group reach a decision by accepting an alternative which has been justified by the speaker and supported by someone else. It is not a process of assertion and counter assertion.

As well as suggesting strategies, the groups also suggested different interpretations of evidence which had to be considered by the group through dialogue to arrive at agreement as to the most likely alternative. Group 4 provide a short example.

- [1] H: [*Reading*] "Ruler of Advir. Columbus saw nothing." [*Howard has misread the information here. Anthony picks this up in the next utterance.*]
- [2] A: Saw something. So that means we're on the right track.

In [1] Howard is highlighting some of the information as an initiating move. Anthony then offers his interpretation of the value of this evidence in [2], unobtrusively correcting Howard in the process. However, he does not offer any explicit evidence in support of why he thinks they are on the right track, and the discourse does not develop any further from this initiating move.

Group 1 provide an example where the discourse does develop.

- [1] L: Go on.
[2] B: Cumulus.
[3] A: He's ruler of Advar.
[Mispronounced]
[4] D:? Advar.
[5] A: Advir.
[6] L: He/ She is/ because she's princess
isn't she?
[7] D: I thought/ Oh.
[8] L: Cos/ she's princess.
[9] D: She must be Queen then/ if she's
ruler, isn't she?
[10] A: She can't be Queen, can she?
[11] B: She can't be Queen and Princess at
the same time.
[Laughter]
[12] L: She'll just have to be a Princess.
[13] A: No she's not called that./She's
called Elena.
[14] L: Awgh/ Just/ just/ come on.

This attempt to resolve the status of one of the main characters in the database, *Princess Elena*, shows how the group suggest possibilities and handle differences of opinion. *Princess Elena* is ruler of the Land of Advir, so should in fact be known as Queen, a fact pointed out by Danielle in [9] and justified by, "if she's ruler". Amanda's utterance in [10] is said very tentatively and Beverley in [11] provides a humorous interpretation of the discussion so far. Lyndsey resolves the matter in a pragmatic fashion by offering the suggestion that, "Well she'll just have to be a princess" and signals an end to the discussion with, "Awgh. Just/ just/ come on", even though Amanda is still not certain.

Alternative possibilities have been laid on the table by the group and considered. Lyndsey's utterance in [14] moves the

action on in a pragmatic way. It is a tacit acceptance that this problem is not central to their task and so can be left on one side. However, the possibilities have been aired.

Accepting alternative view

For the children to make progress through the task one of the proffered alternatives has to be accepted. There are examples in the extracts already quoted, but a further extract from group 3 is added here for completeness and also to show again how the suggestion of alternative interpretations is a key feature of the children's discourse.

- [1] C: Right. [Reading] "I saw a scaly creature with Drogon. Greenish colour." It was yellow before.// Look for someone with green scales.// What...
- [2] R: Maybe it's green with yellow spots.
- [3] C: Maybe it's that person who can change their colour.
- [4] R: Oh yeah.

Clare's initiating move as well as highlighting part of the information also offers her interpretation and raises the discrepancy between this new piece of information and what had gone before. Rosalind suggests one possible interpretation of this evidence in [2] which is followed by Clare's reinterpretation in [3]. In [4] Rosalind accepts this alternative. It is worth noticing that Clare doesn't disagree with Rosalind's suggestion but suggests another one of her own to lie on the table with Rosalind's. The discourse is usually conducted in a very tentative manner such that the participants seem to realise that suggested alternatives are only that: that there are no absolutes.

Disagreeing

AS noted above, it is rare in the recordings for group members to disagree with each other. If they do, they rarely assert a different point of view without justifying it. This may be because disagreement is a potential source of conflict which may be lessened if clearly seen to be justified by the evidence offered in support. It is the means by which discordant views may be exchanged and possibly reformulated, the language of negotiation. Group 1 provide an example.

- [1] D: & L: [*Reading*] "From the mountains I saw two people running with the Orb."
[2] L: He never/ That/ That's why he goes to the mountains. Cos he says, errmm, Drogon...
[3] B: Drogon always goes to the mountains.
[4] L: Drogon/ always goes to the mountains.
[5] A: And so does Cumulus.
[6] L: And he never leaves the mountains.
[7] A: No. But this isn't about, errmm, what's he called? Isn't about him. It's about Cumulus. Cumulus because, look, "*Background*"// is his background. [*Pointing to screen.*]
[8] B: True.
[9] L: Go on.
[10] B: Right. So now what?

Here the group have gained an additional piece of information about the character, Cumulus. In [7] Lyndsey is not so much disagreeing with a fact rather more with Beverley and Lyndsey's line of reasoning in utterances [2] to [6]. She reminds them that the information they've just obtained refers to the character Cumulus, not Drogon. This is accepted by Beverley, "True", and Lyndsey, "Go on."

There is actually very little explicit disagreement in any of the groups. The children make progress more by qualifying suggestions and/or justifying them, both their own and other people's. What disagreement there is is very often associated with operational tasks, and, given the need to key in accurately spelt queries when searching for information, any minor disagreement is often about the correct spelling of words. Group 2 provide a short example.

- [1] D: Oh. You/ we put "Cumulus" not "as". We put "as".
[2] F: We didn't.
[3] D: Cumulas.
[4] F: Cu...
[5] M: You wrote it down there. [*Pointing to notebook.*]
[6] F: Oh./Right. Errmm.

Dominic and Fayaz offer alternative possibilities for the spelling of Cumulus, a dispute which Martin solves by reminding Fayaz where the correct spelling is to be found. Fayaz then checks this and accepts the alternative spelling.

Qualifying

Qualifying, either their own or another's utterances is a strategy which extends discourse. It would appear to be very valuable in that it indicates that the children involved are actively considering their own and others' utterances, and recognising their provisional nature and that they do not need to be either accepted or rejected but can be modified to become, perhaps, more acceptable to the group. An initial suggestion is often reworked in this way. Take this example from Group 3.

- [1] J: Find someone who isn't a robot. We'll find someone who isn't a servant, because Drogon must be the servant of someone else who made him do it.
- [Rosalind continues to make notes silently.]
- [2] C: All right. Carry on.
- [3] J: Think they must be evil because if they were good...
- [4] C: They wouldn't make him do it.
- [5] J: They wouldn't have.
- [6] C: It'll be someone who's powerful.
- [7] J: Yeah./ He'd have to be evil because if they were good he won't think of... [*makes circling gesture with hand.*]
- [8] C: Probably someone who's got yellow/ who's got scales.

This is seen as a very powerful piece of discourse in that it clearly shows how the group works together to refine an initial suggestion and jointly create new knowledge.

Jenny's initial suggestion contains what appears to be a slip of the tongue when she says "robot." This is corrected at once in the next utterance to "servant." She then justifies this suggestion with, "because Drogon must be the servant of someone else who made him do it." In [2] Clare supports this suggestion which allows Jenny to begin to refine her initial suggestion in [3], a qualification which is completed by Clare in [4]. Clare then further refines their hypothesis so far in [6] and again in [8].

Supporting others

Support is often shown by the close way of working the group have, one member often completing another's utterance, a

feature sometimes termed duetting. Extract 1 from group 2's talk has already shown this. Another extract from this group shows a similar process at work.

- [1] D: Well. Right. So he saw two people. That were the people who stole the Orb.
[2] F: Running. [*Talking to himself as he notes down information in his book.*]
[3] D: And that was Eye-Ess and...
[4] M: Faldor.
[5] D: Faldor.

In [4] Martin completes Dominic's utterance in [3] and Dominic confirms his support for this in [5]. The children do not usually resort to formal assertions of support. It is all very informal and low-key.

ELICICTING

These are moves where one member of the group prompts another to contribute to the discourse. As such they are another way of maintaining the talk. Elicitations may take many forms, but the moves regarded as valuable here are those where one person requests from another either more information or their opinions.

Requesting information

These may be very simple requests, such as asking another group member for the spelling of a word, or they may be requests which stimulate other members of the group to recall information already acquired. Group 2 provide a simple example.

- [1] M: I know. We're going to Elena.

[2] D: How do you spell it?
[3] D:&F: Elena. Elena.
[4] D: E/E/L/E [Spelling]
[5] F: Are you sure it's E/ Ele...
[6] D: Eleen...

Another example from group 2 shows one member asking another about information already acquired.

[1] D: Have you got anybody else?
[2] F: Errmm. Got Mondis. But we've already interviewed...
[3] D: Errrrmm.
[4] F: Orb.
[5] D: Evil.
[6] F: Got him.
[7] D: Have we already heard Faldor's speech?
[8] F: I don't know.
[9] D: How many// How many yellow-scaled...
[10] F: Faldor always, always does bidding for Eye-Ess.
[11] M: Let's go down.
[12] F: (...)
[13] M: Errmm.
[14] F: We'll have to think about this.
[15] M: Where's that one that we never saw?
[16] F: Which one? Kaspolov?
[17] M: Yeah.
[18] F: I don't know about him.
[19] M: Haven't bin to him.
[20] F: Yeah we 'ave.
[21] F: He's the one that was all red.
[22] F: He said, "Gun. Red."
[23] M: Oh.
[24] F: We've bin to 'im.
[25] M: Oh aye.

Here the group have acquired a piece of information from the database which suggests that the person they're searching for is an evil, yellow-scaled creature. In this extract Dominic requires the group to consider this new information by reviewing what they have already know. He uses a strategy very like the one a teacher might. Initially he asks a very general question, "Have you got anybody else?", but then becomes more specific with, "Have we already heard Faldor's

speech?" [7], and, "How many// How many yellow-scaled...?", [9].

This review doesn't help them to reach any conclusions immediately as may be seen in Fayaz's, "We'll have to think about this." Unlike teacher questioning however, the group are free to allow another member to take on the role of questioner, a role that falls to Martin in [15]. No one member of this group dominates although in group 3 one person, Clare, did dominate the questioning.

Requesting others' opinions/views

Asking for others' views indicates that they are seen as valuable. It is part of the modification of the questioner's own views. However, it may not always lead to much extension of the conversation, and, in general, it was not a strategy used very frequently by the groups. Here is a short example from group 3.

- [1] C: [Reading] "Vena looks human. Her job is to protect Elena." /She's good and she said, "Dragon" [*Mispronounces Drogon as Dragon.*]
[2] J: Drogon. [Corrects pronunciation.]
[3] C: "Drogon often goes to the mountains." / Shall we go to the mountains?
[4] R: I know. We could do, errm, the place...
[5] J: How about lookin' at...
[6] R: About the Habitat.
[7] C: Habitat. Go to Habitat.

In [3] Clare is suggesting a strategy for them to follow, that they go to the mountains to search for further

information there. She asks for approval of this idea from the others. Implicitly, Jenny and Rosalind sanction this approach by suggesting that the group look at "Habitat". (This is the field they will need to search through to find out more about the mountains.) The extract ends with Clare directing them to go to the Habitat field in the database.

Little discourse was generated by the initial question although progress was maintained through the task. This was true of all of the groups: relatively few questions were asked, and when they were, relatively little discourse resulted.

TEACHER TALK

When the groups requested it I gave assistance. The form that this took may be seen in this extract below from group 4.

(T: = Teacher)

- [1] H: Sir. Does this person rule Drogon?
[Howard is requesting clarification of the information they have already been given because they are uncertain where to go next.]
- [2] T: Yeah. Don't know whether it's going to say that 'though.// What clues have you got so far?
[Trying to get them to reflect on what they know so far.]
- [3] H: We went wrong a lot. Vena, Elena, Columbus. *[Names of characters in the database.]*
- [4] T: What did Vena say?
- [5] H: She says, errr, "Columbus saw something." Two people. But that's it. That's all it says. That's all Columbus says. *[Here, Howard has misread "Cumulus" as "Columbus."]*
- [6] A: Saw two people going. Mountains.
- [7] T: Have you found Vena?
- [8] H: Yes. She just said, errmm.

- [9] A: Columbus saw something.
[10] T: Show me Vena again.
[11] H: *[Finds Vena in the database then reads her record to himself.]*
[12] H:or A:*[Reading]* "Drogon often goes to the mountains."
[13] N: (...) *[Muttering]*
[14] H: Right. We'll start with Drogon. He's number one isn't he?
[15] T: Mountains are "Habitat" aren't they?
[16] H: Yeah.
[17] T: So, when you search, search "Habitat."
[18] H: Oh yes.// We don't need that, do we? *[To Neil about information on screen.]*
[19] H: Moun/tains. *[Talks to self as he keys in the word "mountains."]*

Here I may be seen to be scaffolding their discourse which had stalled. Initially I clarified the particular point they had asked about and then tried to get them to consider the information they already had acquired, gradually becoming more specific until the group were able to continue without my help. (In [18] above, Howard accepts my assistance and then turns away to continue unaided.)

Each of the groups requested help in some form or other during the task which was given until the group could resume the task. I saw my function very much as scaffolding their discourse rather than directing it.

THE CHILDREN'S TALK: CONCLUSIONS

Communicative Competence

The dialogue of the four groups possessed structure. It was not a collection of random utterances. The children were using language to communicate competently with each other, i.e. to exchange ideas and opinions. They were able to work together in their joint construction of knowledge and to maintain progress through the task.

It was found that the predominant way of working was for the children to highlight part of the information displayed by the computer and then to suggest alternative interpretations of this information or alternative strategies to follow based on it. These alternatives were often supported by some form of justification or evidence. Alternative interpretations were offered and lay on the table until one was suggested which the group agreed on. Because simple assertion of a point of view was rare and most of the discourse was conducted in a very tentative manner, disagreement was kept to a minimum, but, where this did exist, again the children tried to offer justification for their conflicting views.

Language for learning

The children used their discourse skills to acquire information, to evaluate it and to suggest its value to their task. Their talk was exploratory in nature, indicated by its tentativeness. Absolutes were rare. A hypothetical mode of

working was adopted which allowed them to reformulate their knowledge easily. Knowledge was indeed something the children created themselves, and something which they demonstrated by their discourse was constantly changing.

The children paid close attention to each other's contributions: recalling past actions; considering recently acquired/constructed knowledge; using it to plan future action. In the process they formulated and reformulated their individual and joint knowledge in order to solve the problems they faced: they used language successfully in the given context.

THE CONTRIBUTION OF THE DATABASE

Structure

The database's main contribution could be seen in the provision of a structured context within which the children were able to use their own language. It helped them to explore the task systematically, presenting information to them only on their request and in what Papert would term, "mind-sized bites." (Papert, S., 1980.)

Initiating Discourse

The database could be regarded as initiating some of the discourse, and hence, as has been shown, providing a focus for subsequent discussion, but it did not control that discussion as a teacher might. The way the children chose to

extend the discussion was their's alone.

Provision of alternatives

The database provided a store of information which the children had to explore in order to make progress through the task. The evidence they acquired was then used by them to base future decisions on. In this way the children were not passive receivers of knowledge, but had to seek it actively using the language of collaboration, a process seen as very valuable under a social constructivist approach to teaching and learning.

THE CONTRIBUTION OF THE TEACHER

The research showed that the role of the teacher was as provider of a context in which the children could talk but that teacher scaffolding of the discourse was sometimes necessary when the talk stalled.

POSSIBLE FUTURE DIRECTIONS

The study did show that the children worked collaboratively, but it also revealed that in one case (Group 3) one member of the group was dominant, and that this reduced the amount of interaction and exchange in the group, although it didn't reduce their creation of new knowledge. It does raise the issue that some groups of learners may be so close that much communication is by slight gesture or subtle body-language. It doesn't mean that the group are less effective in some

way. But it does raise the question, perhaps, of whether this type of activity encourages collaborative discussion in normally reticent children.

What this means is that using a computer database can stimulate close and intensive discussion, but that it may not do so for all children in all circumstances. It is only one more activity to be used by the teacher in encouraging oracy skills.

SIGNIFICANCE OF THE FINDINGS

PRACTICAL SIGNIFICANCE

The research has shown the kinds of collaborative talk used by children as they work with a computer database. This may help to validate the use of computer databases as one more context which may be used in the development of children's oracy. It may also help to reinforce the value of children collaborating in their construction of knowledge and may dispel the notion of the lone child working at the computer being the only way of working possible.

THEORETICAL SIGNIFICANCE

The research may have some theoretical significance in that it shows how learners construct, share, elaborate and refine knowledge as they work together.

METHODOLOGICAL SIGNIFICANCE

The descriptive system devised is specific to this study, but it may have some applicability in the analysis of discourse in other classrooms where computer databases are in use. It would not be appropriate to claim any wider application of the system.

STUDY EVALUATION

A major difficulty with this type of research is recording talk in real situations. This study got as close as was felt possible in the given circumstances. It would have been enhanced by more sophisticated (and expensive) recording equipment which could have recorded talk in the full classroom situation. In a similar way, it would have been immensely useful to have been able to record the computer display onto video to more closely analyse its effect on the dialogue. This is possible, but again needs extra hardware.

It was felt that the attempt to identify categories of collaborative discourse in the children's talk was valuable, but the categories identified were only some of the many possible, and follow the trend for studies of this nature all to devise their own systems which makes comparison more difficult. Further, this type of system is still very subjective. Another reader/listener could place the children's utterances differently.

Finally, the validity of the study could perhaps have been improved by using complementary methods of investigation, perhaps by interviewing the children after the completion of the recording.

But, in the end, and perhaps summing up work of this nature, Holt may have had it,

"Formal evaluation is a needlessly elaborated search for inaccessible truths, and one which substitutes the drab routines of assessment and categorisation for the creative pleasures of planning, teaching and learning."

(Holt, M., 1981, P.175.)

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