can do very well with relatively crude instruments, ones that can be taught quickly to novice teachers and then used by them in their own teaching, without spending inordinate amounts of time transcribing and analyzing recorded data. (1991:11)

In other words, a simple general framework should be introduced instead of an elaborate one. Teachers confronted with pages and pages of transcription often feel at a loss because they do not know where to begin. A very useful starting point is to give teachers an idea of the how classroom discourse is structured. Sinclair & Coulthard's (1975) system provides an excellent framework for analyzing the structure of classroom interaction. They propose that classroom discourse can be analyzed in terms of the following hierarchical units for analysis: 'Lesson', 'Transaction', 'Exchange', 'Move' and 'Act'. A typical classroom Exchange is made up of three Moves: an Initiating Move (I) which asks for a response, either verbal or non-verbal, a Responding Move (R) which gives a response, and a Follow-up Move (F) which gives feedback on the response. The following is an example of how classroom data can be analyzed in terms of Exchanges and Moves. In the following excerpt, there are two Exchanges, each made up of three Moves.

(4) [Class A/Excerpt 4]
I   T: Is it late in the afternoon now? (nominate)
R   P: No.
F   T: No.
I   What is it? Is it in the afternoon now? No, when is it?
            It is in the ...
R   P: In the afternoon.
F   T: No, no. Sit down.

Sinclair & Coulthard further analyzed Moves as consisting of Acts with the structure 'pre-head act(s)', 'head act' and 'post-head act(s)' with the head act carrying the main function of a Move. For teacher education purposes, it is not necessary to make fine distinctions among these three types of acts. All teachers need to do is identify the function of a particular Move. For example, the function of the second Initiating Move is to get the student to answer a question. The teacher asked a question followed by two modifications of the question and a clue to help the student to give an answer.

A Transaction is made up of a number of Exchanges. In a lesson where the teacher moves from one activity to another or from one teaching point to another, he/she often indicates the transition by using markers like "Right", "Okay", "Now", spoken with a high fall. For example, "Okay. I would now like you to turn to your workbook and work on the first three questions with your partner.". A number of Transactions make up a Lesson which is a pedagogical unit delimited by the ringing of the bell.

This framework helps teachers to see the structure of classroom interaction and how a lesson is organized.

Devising Descriptive Categories

Within this general structural framework, teachers can devise their own categories depending on the aspect of classroom discourse that they wish to focus on. As Allwright and Bailey point out "... as a starting point, categories devised by teacher trainees themselves may suffice very well to provoke fruitful thought and even helpful behavioural change." (1991: 13). To help teachers devise their own categories, an example of an analytical instrument and the rationale behind its design can be given. For example, in Tsui (1985), the Seventeen Category System is devised according to the aspects that the study wishes to focus on. In order to examine the verbal interaction pattern, classroom discourse was classified primarily in terms of 'Teacher Talk' and 'Pupil Talk', both of which were further classified into 'Initiate' and 'Respond'. By looking at the percentage taken up by each type of Talk, we can get a rough picture of the balance of talk between the teacher and the students, we can also see the direction of the interaction, that is, whether it is largely uni-directional, going from the teacher to the students, or whether it is multi-directional, going also from the students to the teacher and from students to students. For example, a very high percentage of Teacher Initiate and a very low percentage of Pupil Initiate would mean that the interaction is largely uni-directional.

In order to examine the language input provided by the teacher and how it affects the immediate output of the pupils, the category 'Elicit', whose function is to solicit a response from students, is further classified into 'display questions' and 'genuine questions'. Display questions are those which check students' knowledge whereas genuine questions are those to which the teacher does not have an answer. The purpose of differentiating these two types of question is to see whether they solicit different kinds of response from students (see Long & Sato 1983, Brock 1986, Nunan 1987). Display questions are further classified into 'factual', 'yes-no', 'reasoning' and 'explanation' questions on the basis that yes-no questions tend to solicit short responses of either yes or no, and reasoning and explanation questions tend to solicit longer responses. In other words, the classification of questions is made on both the quality and the quantity of the responses elicited. The category Respond in Pupil Talk is classified into 'Restricted' and 'Expanded Responses'. The correlation between the types of question asked and the categories of Pupil Respond solicited would show the effect of questions on the immediate output of students.

In order to examine the modifications of input and how they affect student response, the category 'Re-stating Elicit' is devised to describe questions which are not asked for the first time. Re-stating Elicits are further classified into whether they are mere repetitions or modifications of the previous question. An analysis of the relationship between these modification types and student responses would provide information about their effectiveness in getting students to participate. (For a detailed description of the system, see Tsui 1985).

In other words, the aim of presenting analytical instruments to teachers is not so much to persuade them to adopt any particular one, but rather to help them to come up with their own instruments which serve their own purposes. However, before teachers can devise their own categories, they must decide what aspects of classroom discourse they would like to focus on. In the rest of this paper, I shall discuss briefly some aspects which may be relevant and of interest to ELT teachers.

Questions

Studies on teachers' questioning behaviour show that questions constitute 20% – 40% of the major syntactic types in classroom talk (see Chaudron 1988). In most ESL classrooms, the majority of classroom interaction is generated by the teacher asking questions. For example, in Tsui (1985), it was found that nearly 70% of the classroom talk in two different English lessons consisted of the teacher asking questions, nominating a student to answer the question, the student providing an answer and the teacher giving feedback (see also Shapiro 1979). Questions are therefore a very important aspect of classroom discourse analysis. As Chaudron (1988) points out, questions may facilitate interaction by establishing the topic and allocating speaking turns, but they may also prevent the student from giving a lengthy response.

Different types of question and how they affect student participation has been the focus of investigation. Early studies in L1 classrooms make a distinction between 'closed' and 'open-ended' questions (Barnes et al 1969). A closed question is one which solicits a particular response from a closed set of choices and an open-ended question is one which accepts a whole range of responses. Closed questions range from ones like *What is the man in the picture doing?*, where there are only a limited number of acceptable responses, to ones like (2) and (4) given above where there is only one acceptable response, both in terms of content and form. In (4), the teacher herself limits the choices of the answer by providing the structure of the response *It is in the ...* so that all the student had to do was to fill in the word *morning*. Hence, in terms of language production, open-ended questions are more likely to get students to produce more lengthy responses.

More recent studies of ESL classrooms make a further distinction between display questions and 'referential questions' (Long & Sato 1983). The latter is referred to as genuine questions in Tsui (1985). This distinction is an important one given the emphasis on meaningful communication in the language classroom. A comparison of (5) and (6) below will help teachers to appreciate the different kinds of communication generated by these two types of questions.

(5) T: What's the time?
    S: Ten o'clock.
    T: Well done.
(6) Passenger A: What's the time please?
    Passenger B: Ten o'clock.

Passenger A: Well done.

While (5) is a perfectly acceptable Exchange, (6) is not. This is because in social communication, as opposed to classroom communication, people do not go around asking questions to which they already have an answer. If they did, it often implies a challenge. For example,

(7) [Coulthard & Brazil 1981: 90]
  Wife: What time did you come home last night?
  Husband: about midnight.
  Wife: No you didn't.

In addition, in social communication, the meaning of an utterance is subject to the negotiation between the speaker and the hearer. Consider the following example,

(8) [Tsui 1987:339]
  A: So the meeting's on Friday
  B: Thanks
  A: No, I'm asking you
  B: Sorry, yes, it's on Friday
  A: Thanks

A's initial utterance was intended to be a question. But it was interpreted as a statement of information by B, as can be seen from B's thanking A for the information. A then clarified the function of his initial utterance as a question which was then responded to by B's apologizing for his misinterpretation. In other words, the meaning of A's utterance as a question asking for confirmation of the date of the meeting was *negotiated* between the two speakers. The negotiation of meaning is often absent in classroom Exchanges initiated by display questions in which the meaning of the question and what constitutes an appropriate response are predetermined by the teacher. If the student's response does not match what the teacher considers to be appropriate, it will be rejected or negatively evaluated (see Tsui 1987 for a detailed discussion of the differences between social discourse and classroom discourse). An analysis of the percentage taken up by each type of question among all the questions asked will inform teachers of the kinds of communication that are generated, or at least that the teacher attempts to generate, in the ESL classroom.

  Two caveats should be made here, however. Firstly, what looks like a referential question may not be intended as one by the teacher. For example,

(9) [Tsui 1985: 19]
  Teacher: Do you think that em was it exciting that night? Mm? Do you
      think that it was very it was exciting? Right, (nominate) what
      do you think? It was, it was—
  Student: It was very exciting.
  Teacher: It was very exciting. Right, yes. Sit down.

In (9), we can see that the teacher's referential question asking for the student's opinion was intended to be a display question. This can be seen from the structural clue *It was*, provided by the teacher (see Tsui 1985, 1992 for further examples). Conversely, the teacher's referential question is

sometimes taken as a display question by the student. Long (1975) gave the following example taken from a lesson where the structural pattern *I've got a* – and a short affirmative answer were practised.

(10) [Long 1975:213]

> T: Have you got any brothers and sisters, Pedro?
> S: Yes, I have.
> T: You have, good. How many?
> S: Er no er I no ...

Here, the student, Pedro, took the teacher's referential question as a display question to check if he had mastered the structural form. It was only when the teacher followed up his response by asking *how many* that he realized that it was intended to be a referential question. Hence, when analyzing questions, it is important not to use the surface form of the question as the sole criterion for classification.

Secondly, although it has been found in some studies in classroom research that referential questions promote longer and syntactically more complex responses (see Brock 1986, Nunan 1987), this is not necessarily the case. In fact, Long et al's (1984) study found that although referential questions elicit slightly more student utterances, display questions tend to elicit more student turns. Wu (1992), in a study of four ESL teachers' questions, found that in terms of eliciting responses, referential and open-ended questions tend to be less effective than display and closed questions in getting student responses. In the four lessons that he studied, although a large number of referential and open-ended questions were asked, only one elicited an elaborate response. Wu maintains that this is due to the cultural background of the students. Chinese students in Hong Kong generally tend to avoid volunteering answers and when they are called upon to respond, they prefer to give short answers. This, according to him, is because they do not want to give the impression that they are showing off[3] (see also Wong 1984). Although Wu's claim has yet to be substantiated by further research, it is certainly true that the type of question asked by the teacher is not the only factor that affects the kind of interaction generated in the classroom.

Modification of Questions

In the above section, we mentioned that there are factors other than question types which affect students' verbal contribution in class. One of the language-related factors is how teachers modify their questions when they fail to get an answer. White and Lightbown (1984), in a study of three secondary ESL teachers, found that about 40% of their questions received no response and up to 64% of their questions were repetitions of the previous questions, with as many as nine repetitions of the previous question. In Tsui (1985), it was found that the teacher who often simplified the questions was much more successful in getting student response than the one who merely repeated the questions. In other words, whether the right kind of modification has been made of the question is very important and it is necessary that teachers are aware of the various means of modifying questions.

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Generally, we may say that there are two major kinds of modification; one is question-oriented and the other is response-oriented. The former modifies the question itself. There are various ways of doing it. Firstly, the modification can be semantic, which includes paraphrasing and lexical substitution. The following is an example.

(11) [Tsui 1992:55]

    T: I suppose if you were on the street and somebody comes up to you and says to you, we – can you tell me the way to a certain theatre, maybe you would know it, but maybe you wouldn't even. But if somebody says can you tell me who designed that building, would you know?

    Ss: Ø

→T: Do you know who designed any building at all?

    Ss: Ø

→T: Do you know the name of any architect who designs buildings in Hong Kong at all?

    S: (raises hand)

    T: Yes?

    S: My father is an architect.

    T: Oh is that so! Well, tell me, do you know the name of any building which your father has designed.

    S: I don't know the name but I know which building.

In (11), the phrase *who designed any building* is semantically difficult for students, particularly primary students because of its abstract meaning. The teacher paraphrased *who* as *the name of any architect* which is much more concrete. The effectiveness of this modification can be seen from a pupil volunteering to answer the question.

Secondly, the modification can be a repetition of only the key word in the question. For example, *When did the boys put up their tent? When?*. In this question, the time element is most important and the key word *when* is repeated. Thirdly, the modification can be done by making the topic salient. This is often necessary when one question is embedded in another. For example, in the question *Do you know what an emperor is?*, the question *What is an emperor?* is embedded in *Do you know—*. This often causes difficulties to students whose English proficiency is low. By modifying it to *What is an emperor?*, the teacher is taking the main question out of the embedding, hence making it easier to understand. Fourthly, the modification can be done by dividing the question. In (11), above, the teacher was asking for two pieces of information in the question *Do you know who designed any buildings at all?*, namely the name of a person and the name of a building. She later divided the question into two questions. She first asked for the name of an architect and then the name of the building.

Response-oriented modifications are those which facilitate the production of a response. One way is to provide clues. Buckheister and Fanselow (1984) outlined the different types of clues that may help students to narrow down the number of possible choices. For example, some clues

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may describe the attribute of the expected response, as in *Do you remember how he said it? He said it in a very polite way. How did he say it?*. Some clues may compare or contrast the expected response to something as in, for example, *What did he find in the big trash bag? Something that looks like a bell*. Another way is to rephrase the question to make it easier for the student to respond. A very common way of doing it is to go from wh-questions to yes-no questions. For example,

(12)[Tsui 1985:22]

    T: What sort of mood was he in, Anasa, to begin with?
    P: Ø
    T: Was he in a good mood?
    P: No.
    T: No, he was in a very bad mood, a black mood ...

A yes-no question is much easier to respond to because all the student needs to do is to say *yes* or *no*. Another way is to rephrase the question as alternative questions. For example, *What do you think he is going to do? Is he going to call the ambulance or is he going to take him to the hospital himself?*. Alternative questions spell out the possible answers and are therefore easier for students to respond to.

Again two caveats have to be made here. Although modifications are generally more effective than verbatim repetitions in terms of making the question more comprehensible and easier to respond to, the latter should not be dismissed as valueless. Students whose English proficiency is low usually take longer to process the language. Sometimes, by the time they have processed the first part of the question, they have already forgotten the second part of the question. By repeating it verbatim, we are giving them more time and helping them to process the entire question. Of course, if responses are not forthcoming even after verbatim repetitions, then modifications must be made.

Secondly, it must not be assumed that modifications of questions are necessarily effective. Over-modification can lead to confusion, and elaboration and explanation can lead to ambiguity rather than clarification. Simplifications made by using a large number of anaphoric pronouns like *it, this, they*, and so on, in fact put a greater demand on the learner's linguistic ability in order to retrieve the antecedents of the referents (see White & Lightbown 1984; Chaudron 1983; Tsui 1992).

Apart from modifications, 'wait time' is also an important factor in getting student responses. Studies in both L1 and L2 classrooms have shown that an increase in wait time leads to an increase in student responses (see Holley & King 1971; White and Lightbown 1984; Long et al 1984). Many teachers, however, repeat or rephrase the question as soon as there is no immediate response with the good intention of keeping a brisk pace and getting students to participate. They often do not realize that by giving very little wait time for students to think about the question and construct an appropriate response, they are in fact making it more difficult for the latter to respond. When teachers are presented with classroom data, however, they

usually spot the problem very quickly. For example, my teachers were quick to point out that Teacher A kept firing questions at her students and did not give them a chance to respond.

Modification of Interaction

The modifications of questions discussed so far are largely linguistic modifications. Recent studies on second language classroom discourse have shifted the focus to modifications of interactional structure which are considered to be more important in providing comprehensible input than linguistic modifications (Long 1983a). Modifications in interactional structure refer to adjustments made which affect the interactional structure of the discourse. For example,

(13) [Long 1983a: 128]

NS: What time did you finish?	(question)
NS: Ten.	(answer)

(14) [Long 1983a:128]

NS: When did you finish?	(question)
NNS: Um?	(clarification request)
NS: When did you finish?	(repetition)
NNS: Ten clock.	(answer)
NS: Ten o'clock?	(confirmation check)
NNS: Yeah.	(confirmation)

In (14), we can see that as a result of the negotiation of meaning, the interactional structure was modified from a "question-answer" sequence to a "question – clarification request – repetition – answer – confirmation check – confirmation" sequence.

Long (1983b) proposed a number interactional modification devices among which the following are easily identifiable by teachers: (*a*) 'comprehension checks' which ensure that students have understood, e.g. *Right? Okay? Do you understand?*; (*b*) 'clarification requests' which ask for clarification, e.g. *What do you mean?*; (*c*) 'confirmation checks' which ensure that the teacher has understood what the student said; (*d*) 'other-repetitions' which repeat all or part of what the student has said. In a sense, modification of questions is a form of interactional modification because in modifying the question upon getting no response, the teacher is also modifying the interactional structure (as in (14) above).

Doughty & Pica (1986) examined how much negotiation has taken place by looking at the quantity of interactional modification devices used. While it is certainly true that the number of modification devices used is indicative of how far the teacher is aware of the importance of making the input comprehensible, it must not be assumed that the use of these devices necessarily leads to the production of comprehensible input. Tsui (1992: 48) points out that "negotiation is an interactive process involving both the speaker and the hearer. It is impossible to determine the quality of the input and the quantity of negotiation work without looking at non-native speaker or learner feedback and how much they are involved in the interaction." (see

also Varonis & Gass 1985). It is therefore important to distinguish between modification devices which are used by students and those which are used by the teacher. The former is a far more important indicator of students' involvement in the negotiation of meaning than the latter (see Tsui 1992: 52 for examples). It is also important to look at the kinds of modification device used because some are better indicators of learner involvement in the negotiation work than others. For example, clarification requests, confirmation checks and other-repetitions, which can only be performed in reaction to student response, are better indicators than comprehension checks and self-repetitions which can be performed many times without getting any student feedback. White and Lightbown's (1984) example of a teacher repeating a question nine times is a case in point. Tsui (1985), also found that one of the teachers repeated a question eight times without getting a response from the student. In other words, from the point of view of providing comprehensible input to students, it is essential that teachers also look at how actively students are involved in making the input comprehensible.

Teacher Feedback

So far, we have discussed what occurs in the Initiating Move and the Responding Move of a classroom Exchange. A very important aspect of classroom discourse analysis is what goes on in the Follow-up Move. This is a Move where the teacher provides feedback to student responses.

Teachers are generally aware that it is very important to provide positive and encouraging feedback to students. However, what teachers are less aware of is the gap between their perception of the kinds of feedback they have given and what they actually gave. In nearly 200 lessons that I observed, there were far more instances of acceptance of students' responses in the form of *Okay, Alright*, than positive/encouraging feedback like *That's very good., Good try.*. For example, in the two teachers studied in Tsui (1985) there were 42 occurrences of the Act 'Accept', and only one occurrence of 'Encouraging/Positive Evaluate' for one teacher and 37 occurrences of Accept and only two occurrences of Encouraging/Positive Evaluate for the other. It is always a revelation to teachers when they compare their own impressions of the feedback they have given and what they actually see in the transcriptions of their own lessons.

The treatment of errors is another important aspect of teacher feedback. In addressing the question of what is considered an error by the teacher, it is very useful to present them with a piece of data like the following.

(15)[Class A/Excerpt B]

    T: Right, next, and then um who were hungry? Who were hungry? (nominate)

    S: They were hungry. They were hungry.

→ T: They? Don't use the pronoun. Don't use (in Cantonese) the pronoun.

S: The boys were all hungry.
T: The boys were all hungry.

In (15), the student's response which is semantically correct, though slightly vague, was treated by the teacher as an error because he did not followed the idiosyncratic rule that the teacher laid down which is 'pronouns should not be used'. Sometimes, what is a perfectly appropriate response is treated as an error by the teacher simply because it does not match what the teacher has in mind. In a lesson that I observed, the teacher was going to teach a reading passage called the "Bathroom Killer" which was the water heater. He started the lesson by asking students what they would find in a bathroom. Students offered answers like soap, towel, bathtub, bathroom scale. These answers were accepted with a hesitant *yes* spoken in a fall-rise until one student gave water heater as the answer. It was accepted enthusiastically by the teacher who said, "Yes, that's right. This is exactly what I want." In other words, the previous answers, although not evaluated as wrong, were considered not really the right answer by the teacher. This kind of feedback is detrimental to students in terms of not only language learning but learning in general. Teachers who do this constantly are likely to produce students who try to guess what the teacher wants as an answer rather than what is an appropriate answer to the question.

A problem that ESL teachers are often confronted with in error treatment is the treatment of responses which are grammatically incorrect. In the following piece of data, responses which were correct in content were treated as errors.

(16) [Class A/Excerpt 4]
T: Now what did they do after their wonderful meal? What did they do after their wonderful meal? What did they do after their wonderful meal? (nominate)
S: They told stories and sing songs by the—
T: Sing song? Pay attention. Once again, not sing song, past tense please.
S: They told story and sung song.
T: Sung? No.
S: Sang song.
T: Once again.
S: They told story and sing song.
T: No.
S: They told story and sang song by the fire.
T: They told story and sang song by the camp fire.

In (16), we can see that the student's initial response, which makes perfect sense with a mistake in tense only, was rejected by the teacher as an error. In the Exchanges following, the student's several attempts were rejected until he produced the correct tense of the verb *sing*. What is ironical is that in the last response, the student in fact made a mistake with the nouns *story* and *song* by using the singular form rather than the plural form. It was, however, accepted by the teacher as correct.

The data given in (16) raises the question of when errors should be corrected. In (16), the teacher corrected the error as soon as it appeared; she did not even wait till the student finished the sentence. This can be very disruptive and can inhibit students' willingness to contribute at all (see Allwright and Bailey 1991). It would be a very useful exercise to get teachers to look at when they correct errors and when they do not, and ask themselves how decisions regarding whether to correct an error are made.

Finally, the question of how error corrections are made and who makes the corrections should be examined. Chaudron (1987) gave a detailed description of the strategies for error correction. Some of the commonly used ones are expansions of the student's response, making it more complete; repetitions of the student's response with the error changed, or repetitions without changing the error but with the stress placed on the error; adding stress to the location of error and its correction formulation. Apart from corrective strategies, whether the teacher or the student is doing the correction is also important. Teachers should be encouraged to look at the variety of corrective feedback they give to students and to think of what other possible ways there are. As Fanselow (1977) points out, teachers should offer students as great a variety of treatments as possible because there does not seem to be one way that always works and different students need to be treated differently.

Summary

In this paper, I have shared my experience of introducing classroom discourse analysis to ELT teachers. I have pointed out that getting teachers to examine classroom data is a very useful way of distancing them from their own classrooms and helping them to look objectively at their own teaching. In order to give teachers an idea where to start in analyzing classroom data, a general framework should be provided to enable them to see the structure and organization of a lesson. They should then be encouraged to focus on a particular aspect of classroom discourse and to come up with their own descriptive categories which will help them to obtain information on that aspect. Because of the limit of space, it has not been possible to give a comprehensive coverage of all of the aspects dealt with in the classroom discourse analysis literature[4]. Nevertheless, I hope that the discussion in this paper will give teachers who are novices in classroom discourse analysis some idea of how to go about analyzing their own classrooms.

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Notes

1. In Allwright and Bailey (1991:8), the following distinctions were made among "approach", "method" and "techniques" on the basis of Anthony (1963).
     In Anthony's terms, the 'approach' was the philosophy of language and learning that provided the theoretical underpinnings of language teaching. The 'method' was a systematic collection of activities and procedures which were derived logically from the approach. The 'techniques' were the various activities implemented during a lesson, which stemmed, in turn, directly from the method chosen.
2. For a comprehensive summary of the influential analytical instruments, see Allwright (1988).
3. This has been reported by many teachers in Hong Kong.
4. For a comprehensive coverage of the literature, see Chaudron (1988), and Allwright and Bailey (1991).

A GOAL-DIRECTED THINKING FRAMEWORK FOR DECISION MAKING IN LANGUAGE CURRICULUM RENEWAL

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Introduction

> *"Three blind men came together to find out what an elephant looked like. The first man, after touching the elephant's ear, decided that it was big and flat. The second man, who happended to touch the elephant's trunk, decided that it was long and cylindrical. The last man rebutted with confidence, 'No, you're both wrong. It should be sharp and pointed.' Hours of heated discussion went by, but the problem remained unresolved. In the end, they agreed it was time to go, and the decision on what an elephant looked like would best be left to individual wisdom." (Adapted from a Chinese fable)*

It is apparent that the decision making of these three blind men leaves much to be desired. However, the principal cause of their failure is not their blindness. Rather, it is their lack of appropriate thinking strategies for solving their problem together as a team of blind men.

This analogy will make some sense to the language teachers who have had experience of an English panel meeting, where no consensus about how best to improve the teaching materials, tests, or student performance is reached at the end of a seemingly endless discussion. Even if we admit that discussion does not always need to result in ready-made answers, having to go through hours and hours of discussion without arriving at a resolution of the problem is not a gratifying experience either. A language teacher or a panel chairperson in this situation would probably want to know how their decision making strategies can be improved, so that their curriculum renewal work will become more efficient and effective.

That decision making involves thinking is self-evident, but that an insight into thinking will help decision making is not. This can be seen in the current literature on language curriculum renewal (LCR), where thinking remains a relatively unexplored area. Although recent LCR works have already extended their territories to those of management (White 1988) and polity determination[1] (Rodgers 1989), cognition seldom makes its way to the field of curriculum development.

This paper attempts to fill the gap by exploring thinking in the context of LCR. It is divided into three parts. The first part will focus on a discussion of the complex and innovative nature of LCR, and its cognitive demand on teachers or panel chairpersons as decision makers. The second will characterise LCR as an ill-defined problem, and outline some of the

strategies useful for solving ill-defined problems. Some illustrative examples of how these strategies are actually applied in LCR will be given. The paper will end with an exploration of a goal-directed thinking framework for decision making in LCR.

Part One: The nature of LCR and its cognitive demand on decision makers

LCR is essentially multifaceted in nature. It has been compared to the creation of a jigsaw puzzle with interrelated components, each of which, if changed, will affect other parts (Clark 1987, Scarino et al 1988). A modification of teaching objectives, for instance, may necessitate a revision of teaching methods and assessment procedures, which, in turn, may necessitate teacher and learner retraining. Any failure to recognise and act upon this chain effect among interdependent curriculum variables is likely to result in a less than coherent curriculum[2] (Johnson 1989b).

It has been recognised that the success of a language programme is dependent upon a large number of individual factors (Richards 1985, Dubin and Olstain 1986). Sociocultural factors (e.g. status of the target language), learner factors (e.g. learning styles or motivation), and programme characteristics (e.g. materials and testing procedures in use and characteristics of the teacher population) are just a few of them. Teachers responsible for developing a curriculum are, therefore, confronted with a complex cognitive task. They need to process and synthesize a large amount of interrelated information. They are also required to take simultaneous account of a myriad of interdependent factors, and of their numerous possible permutations. This is demanding in terms of memory space, if we reckon that our limited-capacity short-term memory allows us to handle only a limited amount of information at any one time (Simon 1972, 1977). Therefore, until systematic goal-directed thinking is in place to cope with the information load, it is highly likely that a curriculum designer will be forced into arbitrary or piecemeal decision making.

LCR is also a form of innovation (White 1988, Brady 1990), an attempt to change the current state of practice so as to bring about improvement in relation to specific objectives. Since changes are likely to provoke conflict (Nicholls 1983), it is desirable to involve all parties concerned in discussion and decision making, so that later dissensions can be minimised. This task of pooling together the often divergent views of different interest groups, and attempting to resolve them in some way would, again, require a deployment of systematic goal-directed problem solving strategies.

Part Two: LCR and problem solving

1. LCR as an ill-defined problem

In cognitive psychology, a problem has been defined as the gap between where we are and where we want to be (Hayes 1978). It arises when we want to achieve a certain goal, and the goal is not readily

attainable (Matlin 1989). According to Newell and Simon (1972), all problems can be conceptualised as being a *task environment* which consists of three components: an *initial* state, a *goal* state, and *moves* connecting the two. A problem solver, based on his perception of the task environment and other knowledge, forms a new representation. This new representation, which contains all of the possible 'solution moves' that he is aware of, is known as the *problem space*. When solving a problem, he searches through the problem space for the best solution move. This search is aided by the *givens*, which are rules and information that constrain the solution.

Problems can be classified along a continuum ranging from well-defined to ill-defined (Reitman 1964). While the initial state, the moves and the goal state of well-defined problems are clear, those of ill-defined problems are not. Most of the problems encountered in life, such as decorating a house or writing a term paper, are ill-defined. LCR is an instance of an ill-defined problem. Although it is generally understood to be an attempt to improve a curriculum, there are so many forms an improvement can take that the goal is far from clear. This ill-definedness of the goal state often makes the generation of solution moves difficult and their evaluation even more difficult.

2. Problem representation

One of the best ways to overcome the difficulties mentioned above is to make the goal as explicit as possible and to redefine the problem (and hence the goal) in multiple ways so that a variety of solution moves can be generated and evaluated.

An example in the context of LCR will illustrate this point. Language teachers may find that their students appear to have difficulties in understanding extended academic texts. This problem can be very generally represented by the teacher as one of improving student ability to read such texts, but the goal will remain rather obscure until it is more specifically defined. In this case, there are at least three possible ways of redefining the problem. The first is to redefine it as the problem of improving student ability to ask critical questions about an extended argument. This redefinition would help teachers to extend the solution moves to include critical thinking skills and strategies of argumentation, which encourage students to take a more active and critical approach to reading. The goal will become more well-defined: students are expected to demonstrate their ability to ask critical questions and to analyse arguments in extended academic texts.

A second way of representation is to redefine the goal as the problem of diagnosing and remedying students' difficulties in understanding complicated syntactical structures that occur frequently in academic texts. This representation would lead the teacher to explore a very different set of solution moves, which address student's limited syntactical knowledge. The goal will be increased student ability to understand complicated syntax.

A third way is to redefine the problem as one of increasing opportunities for reading extended academic texts. Solution moves could now encompass

finding suitable texts and developing appropriate reading exercises for both teacher-guided and self-access practice. The goal will be student reading of an optimal number of academic texts.

It can be seen from the above that the same problem can be represented very differently. Each representation indicates a particular way of understanding the problem, and the different representations can, at times, be complementary to one another. In fact, constructing an adequate problem representation is critical to finding a solution, and is often a good indicator of how well a problem is understood (Greeno 1977). Findings of recent domain-specific research have indicated that novices and experts differ in their problem representations in Physics. Novices tend to confine themselves to surface and specific details; experts are more likely to abstract and theorise (Larkin 1983, 1985). Whether this difference also exists in LCR remains to be seen.

What makes a good problem representation? Halpern (1989:356) suggests that, "A good representation will contain all of the relevant information or givens and display the relationships among the givens in a way that will facilitate progress toward the goal." When constructing a representation, a problem solver must "tickle his memory" to access and utilise his knowledge about the problem (Newell 1983). He "must be able to make inferences from problem statements in order to build an adequate problem representation – one in which missing and conflicting information is made obvious." (Halpern 1989:357) I will return to the role of information in problem solving in the third part of this paper.

3. Strategies for solving ill-defined problems

Matlin (1989) suggests four strategies useful for solving ill-defined problems. The first two concentrate on making a problem more manageable:

(i) Break the problem into subproblems and work on each of them separately. Then combine them and resolve any incompatibilities.

(ii) Add contraints to the structure of the problem, so that possible solution moves are restricted.

These two strategies can easily be applied to LCR. For example, the problem of improving the assessment procedures of a language programme could be reformulated as two subproblems: tests (summative) and continuous assessment (formative). The problem of tests could be further divided into subproblems of pre-course and post-course tests, each of which may serve identical or different functions, and may have comparable or different formats, contents and criteria.

In order to reach a solution, a curriculum developer must somehow restrict the possibilities. This is best achieved through taking into account most, if not all, of the practical constraints embedded in a particular context. Some of these constraints may include the resources and expertise available for developing and administering the targeted tests, the attitudes and expectations of teachers and students toward such tests, the informativity of test results to different groups of users, and the objectives and content of the

teaching syllabus. Relevant information on these constraints will need to be systematically collected, if they are not yet transparent or available to the decision maker. Until such pragmatic constraints have been carefully considered and reconciled with policy, potential mismatches are likely to result in the actual implementation of tests and the problem of improving assessment procedures is less likely to be successfully solved.

The other two strategies suggested by Matlin (1989) are concerned with the starting and ending points in the problem solving process:

(iii) Start work on the problem in spite of an incomplete understanding of it. Mistakes are informative rather than obstructive.

(iv) Stop when a solution is reached.

The last strategy is appropriate if we accept that LCR often takes place in a dynamic setting of divergent interests and conflicting forces (Jenkins and Shipman 1976). Any solution generated at a specific point of time in a particular context, be it a new teaching unit, a promising teaching approach, or an innovative assessment procedure, can only be taken as a good but not perfect answer to a curriculum problem. The solution will need to undergo a continuing process of evaluation, adaptation and refinement.

4.   A "planful approach" to problem solving

In solving ill-defined problems, a "planful approach" is almost always useful. A "planful approach" to problem solving emphasizes the importance of devising a systematic plan for finding and selecting solutions. It has been advocated in most programs designed to improve problem solving skills (Covington 1987).

Although plans for problem solving may vary in complexity, they generally consist of five steps. The IDEAL model proposed in Bransford and Stein (1984:12) has succinctly summarised these five steps:

I = Identify the problem

D = Define and represent the problem

E = Explore possible strategies

A = Act on the strategies

L = Look back and evaluate the effects of your activities.

This five-step model is applicable in many areas such as business and education. In education, it is easy to find theoretical frameworks which reflect essentially the same sequence of stages as that of IDEAL. Figure 1 has summarised two such instances, Trump's educational innovation sequence (1967) and Skilbeck's situational model for school-based curriculum development (1984), in comparison with the IDEAL framework.

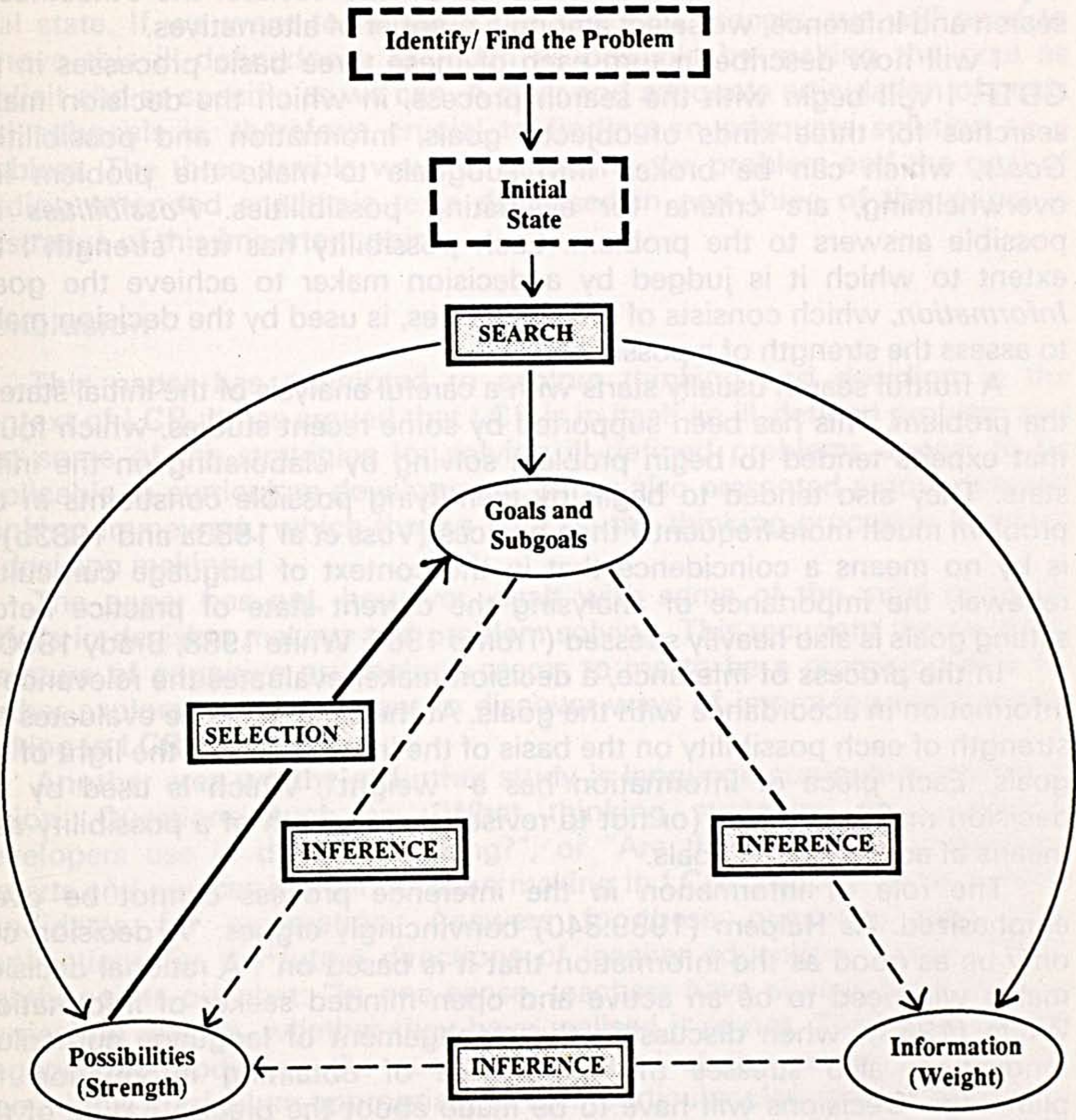# Figure 1: A comparison of IDEAL model with the frameworks in Skilbeck (1984) and Trump (1967)

Bransford and Stein (1984)	Skilbeck (1984)	Trump (1967)
1. Identify a problem	1. Analyse the situation	1. Analyse co-operatively reasons for present practices
2. Define and represent the problem	2. Define objectives	2. Discover what people want that is different from what they are doing
3. Explore possible strategies	3. Design the teaching learning programme	3. Make tentative decisions about the priority of proposed changes
4. Act on the strategies	4. Interpret and implement the programme	4. Plan the innovation carefully in terms of teacher preparation, student preparation, procedures to be followed and the anticipated effects
5. Look back and evaluate the effects of your activities	5. Assess and evaluate	5. Determine the times and techniques for evaluation

Part Three: A goal-directed thinking framework for decision making

While IDEAL provides a useful sequential description of stages in problem solving, it does not throw light on the dynamic thinking processes involved in decision making. Apparently, a normative thinking framework, which attempts to outline such processes, is likely to provide decision makers with a further aid in attacking ill-defined problems. I call it a goal-directed thinking framework (GDTF), as the thinking processes are problem oriented and goal driven. It is this framework which I will now turn to.

Figure 2: A Goal-Directed Thinking Framework for Decision Making (Adapted from Baron 1988)

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        ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
        │  Identify/ Find the Problem │
        └ ─ ─ ─ ─ ─ ─ ┬ ─ ─ ─ ─ ─ ─ ┘
                      │
                      ▼
              ┌ ─ ─ ─ ─ ─ ─ ┐
              │   Initial    │
              │    State     │
              └ ─ ─ ─ ┬ ─ ─ ─ ┘
                      │
                      ▼
              ┌──────────────┐
              │    SEARCH    │
              └──────────────┘

              ╱    Goals and    ╲
                   Subgoals

    ┌──────────────┐
    │  SELECTION   │
    └──────────────┘

        ┌──────────────┐          ┌──────────────┐
        │  INFERENCE   │          │  INFERENCE   │
        └──────────────┘          └──────────────┘

  Possibilities        ┌──────────────┐        Information
   (Strength)   ◀── ── │  INFERENCE   │── ──   (Weight)
                        └──────────────┘
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The GDTF (Figure 2), adapted from Baron (1988)[3], is basically a search-inference-selection framework. It asserts that decision making consists of three basic processes: search, inference and selection. "We search for certain objects. Then we make inferences from and about the objects we have found" (Baron 1988:4). On the basis of the outcomes of search and inference, we select among a number of alternatives.

I will now describe in turn each of these three basic processes in the GDTF. I will begin with the search process, in which the decision maker searches for three kinds of objects: goals, information and possibilities. *Goals*, which can be broken into subgoals to make the problem less overwhelming, are criteria for evaluating possibilities. *Possibilities* are possible answers to the problem. Each possibility has its "strength": the extent to which it is judged by a decision maker to achieve the goals. *Information*, which consists of givens or rules, is used by the decision maker to assess the strength of a possibility.

A fruitful search usually starts with a careful analysis of the initial state of the problem. This has been supported by some recent studies, which found that experts tended to begin problem solving by elaborating on the initial state. They also tended to begin by identifying possible constraints in the problem much more frequently than novices (Voss et al 1983a and 1983b). It is by no means a coincidence that in the context of language curriculum renewal, the importance of analysing the current state of practice before setting goals is also heavily stressed (Trump 1965, White 1988, Brady 1990).

In the process of inference, a decision maker evaluates the relevance of information in accordance with the goals. At the same time, he evaluates the strength of each possibility on the basis of the information, in the light of the goals. Each piece of information has a "weight", which is used by the decision maker to revise (or not to revise) the strength of a possibility as a means of achieving the goals.

The role of information in the inference process cannot be over-emphasized. As Halpern (1989:340) convincingly argues: "A decision can only be as good as the information that it is based on". A rational decision maker will need to be an active and open-minded seeker of information. White (1988), when discussing the management of language curriculum innovation, also stresses the importance of obtaining information for planning: "Decisions will have to be made about the precise nature of the information required and the means of obtaining it" (p.147).

On the other hand, one has to admit that in the decision making process of curriculum renewal, information is often uncertain, and much of it may even be missing. The search for more information may be curtailed by a lack of time, resources or even motivation (on the part of either the information seeker or the information). Making informed decisions should, therefore, at its best, be taken only as making the most rational possible choice, on the basis of the known information, in the light of the goals. We have to allow for the tentativeness and incompleteness inherent in the information available for decision making.

In addition to the search and inference processes, there is a process of selection, in which a decision maker makes a choice among alternative possibilities. The choice will have to be made in accordance with the goals and subgoals. As reviewed in part two of this paper, one of the greatest difficulties in solving ill-defined problems lies with the ill-definedness of the goal state. If we want to facilitate the selection process, we will need to remove this ill-definedness as much as possible by making the goal as explicit and as specific as we can. A clear and adequate articulation of goals and subgoals is, therefore, crucial to finding an adequate solution to a problem. The three pssible ways of definding the problem and the goal of reading extended academic texts discussed in part three of this paper is illustrative of this important point.

Conclusion

This paper has attempted to explore thinking and deciding in the context of LCR. It has argued that LCR is in itself an ill-defined problem and that some of the strategies for solving ill-defined problems appear to be applicable to curriculum development. It has also presented a goal-directed thinking framework, which throws light on the thinking processes involved in decision making.

The paper has not, however, dealt with some of the most common pitfalls in decision making and problem solving. This recurrent theme in the literature of cognitive psychology seems to me to be a promising area for further exploration, if we want to discover ways of improving our decision making in LCR.

Another area worthy of further study is language curriculum makers in action. Questions such as: "What thinking strategies do curriculum developers use in decision making?", or "Are there differences between experts and novices in their decision making in LCR?", appear to be suitable candidates for exploration. Answers to these questions may have implications for the future directions of teacher education. Brady (1990) rightly points out that: "In one sense, teachers have always been the real curriculum makers, whether they have realised it or not. They have always engaged in modifying the curricula prepared at the centre to make an operational curriculum appropriate to their particular classroom." The recent shift of focus in teacher education from the shaping of teaching behaviour to the shaping of teachers' thought about teaching (Freeman 1992) has directly affirmed the importance of thinking in language teaching, and indirectly its importance in language curriculum renewal. This paper has sought to make the latter explicit.

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NOTES:

1. 'Polity determination', according to Rodgers, is a contextually enlarged view of curriculum development, involving all the factors which need to be taken into account when assessing the relative difficulty and 'cost' of implementing a curriculum innovation in a specific 'polito-pedagogical' context.
2. Johnson (1989b) defines a 'coherent curriculum' as one in which there is an absence of mismatches between policy and pragmatic constraints. Although in the real world of policy implementation, this notion of 'coherence' is rarely attainable in its pure form, it is still a desirable state to be approximated to as closely as possible.
3. The framework in Baron (1988), which consists of only search and inference, is devised for personal decision making.

Acknowledgement

THE LANGUAGE IMPROVEMENT COMPONENT OF E.S.L. TEACHER EDUCATION PROGRAMMES: RATIONALE AND DESIGN

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Introduction

Non-native teachers of English as a Foreign or Second Language entering post-experience courses of professional development are by no means always expected to undertake a language improvement component as an integral element of such courses. Indeed, internationally, this kind of component is quite rare and the reasons are not difficult to perceive. It is often argued that teacher education courses carried out in the target language medium naturally involve students in listening to, discussing, and writing about theoretical and curriculum-related issues in that language and that, for these very reasons, a course component focussed explicitly on language concerns is not necessary.

In any case, the argument continues, post-experience students are qualified practitioners whose language knowledge and use can be repaired and enriched, as and when necessary, through a language-focussed element of feedback in their professional studies. This argument also stresses the point that requiring qualified teachers to carry out language improvement work might be perceived as constituting a fairly explicit assumption of professional deficiency. It all seems to be rather like asking a master-cabinet maker to demonstrate the use of a particular tool, rather than encouraging him to design or create a piece of furniture; atomistic practice carried out at the expense of applying a learned craft holistically.

Necessity and Sufficiency

The view outlined above is one with which any liberal teacher educator will sympathise in both professional and philosophical terms. In this brief and exploratory paper, I want to argue that this kind of fluency-focussed orientation provides an entirely necessary, but not completely sufficient, set of conditions to support language improvement concerns. Issues of sufficiency determine that teacher educators be concerned with providing a language improvement component which is not so much based on hazy notions of general levels of target language proficiency, but rather on the recognition of the use-oriented needs, wants and present lacks of the students. This process of realisation will involve negotiation with the students as to what will be included on the syllabus; an important motivational concern and a way in which teacher trainers might keep abreast of concerns about, and uses of, the target language in the post-experience