

**Developing Communicative ESP Reading Skills:
A Study of Methods of Teaching English as a
Foreign Language with Emphasis on EST for
Students of the Faculty of Medicine in Iraq**

Thesis Submitted

By

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**CONTAINS
PULLOUTS**

To my wife and children,
with whom I always share
the pleasure of success.

To my parents, from whom
I learnt that life is a
continuous struggle.

To my beloved country,
which I adore in
sickness and health.

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List of Abbreviations

EAP	English for Academic Purposes
EFL	English as a Foreign Language
ESP	English for Specific Purposes
EST	English for Science and Technology
FL	Foreign Language
IDELTI	The Institute for the Development of English Language Teaching in Iraq
KFM	Kufa Faculty of Medicine in Iraq
L1	First Language
L2	Second Language
TEFL	Teaching English as a Foreign Language
TESL	Teaching English as a Second Language

Abstract

This study attempts to get at some practical implications for the development of communicative ESP reading skills for EST students in science faculties in Iraq. While the title of this study suggests that the teaching itself may be the main topic, in fact, a very substantial amount of the thinking discussed in it is concerned with planning and realisation of potential. I have tried as far as I can to visualise the ESP operation throughout from the viewpoint of the country concerned, which means a constant awareness of its ideologies, its educational setting and the structure of its society, as these affect both national objectives and students' aspirations. The study comprises five chapters and a conclusion; and a substantial part of it is a fieldwork carried out in the faculty of medicine in Iraq.

Chapter One is concerned with the history of the communicative syllabuses and the development of the communicative curriculum. It attempts to show how a realisation of a set of ideas such as notional/functional syllabuses, needs analysis and communicative language teaching came about. It also concentrates on the continuous change in the needs of our developing society, which implies that our methodological observations, commentary and recommendations should not be final. In turn our methods of teaching, research in language

analyses and language learning and, after all, the teaching profession needs to be re-assessed in order to cope with the disciplines relevant to the language teaching/learning process and to the learners' needs. The Chapter also discusses how linguists and language teachers, particularly foreign/second language teachers, have turned their attention to the communicative properties of the language, its use and function, which in turn has led to the notion that the language teaching/learning process should, simply, involve a profound change in the profession towards the idea of communicative language teaching and towards concentration on the practical needs of the learner.

The main thrust of Chapter Two is towards the analysis of the communicative functions of language and the implications of this for ESP. In fact, for the past few years, English for Specific Purposes has been a major developmental focus in the area of communicative syllabus design and materials production. The Chapter identifies some of the factors that characterise ESP and discusses some of the theoretical implications of an approach to EST which emphasises the communicative properties of language without ignoring the linguistic ones. It also emphasises the notion of preparing EST materials which should give priority to learners' needs and aspirations as well as taking the limitations of the educational environment into consideration. The taxonomy of ESP courses, nature of scientific English and approaches to EST materials analysis and production are discussed. Special concentration is also placed on EST teacher training and some

EST communication activities such as group-work techniques, the debate and the information gap activities.

Chapter Three deals with developing reading skills in a foreign language for students of science and technology, with emphasis on reading for meaning. It examines the various skills required in effective reading and suggests classroom approaches and materials to develop and integrate them as well as to integrate reading skills with other language skills. It looks in detail at study skills which are adjacent to reading skills. Types of reading tests are discussed and some reading exercises dealing with authentic scientific reading texts are incorporated. Measurement and evaluation of students' reading skills are also touched upon.

Actually, the huge amount of research carried out in reading skills recently indicates that the problem of developing reading skills has not been solved yet, but these efforts are mute evidence that a solution whereby an effective theory of reading instruction would evolve. Surely there is no magical vaccination which can be injected in students to make them efficient readers, but persistent and scientific efforts can. However, as the significance of reading skills in all subjects is increasingly being recognised, particularly in view of the demands of EST reading courses in EFL situations, it is essential to understand as objectively as possible the use of specific techniques and language teaching approaches which would be of use in fostering and developing reading skills for foreign language learners.

An effort is made in Chapter Four to assess the usefulness of a communicative approach intended to lead medical students to flexibility in their reading of medical texts. The Chapter deals with designing a communicative EST reading skills course for students of the faculty of medicine in Iraq. It sheds some light on some of the language needs of these students, delineates a step-by-step procedure for designing an EST reading skills course for them and shows the way in which the course was applied and the results were analysed and computed. Essentially, the approach adopted involved students in group-work activities to read and reflect on the results of their reading. The approach aimed at extending students' reading competence and developing their reading span.

The fieldwork has shown that authentic and directly relevant texts to students' field of specialisation as well as communicative teaching techniques can improve the student reading skills, motivation and attainment to participate in classroom interaction at discoursal level. It has also shown that more work needs to be done as far as reading, listening, writing and speaking are concerned in the faculty of medicine.

Chapter Five is mainly concerned with the prospects of the EST situation in Iraq. The Chapter commences by outlining various factors in the general academic, administrative and educational environment of EFL in Iraq

which is thought to have affected the sample before university entrance. It also discusses the existing EST situation in the country and touches upon points of failure and success of the profession. It also suggests some implications for possible amendment.

The Conclusion calls for more detailed work to be done for the development of the EST course in science faculties in Iraq where English is increasingly becoming a 'library language'. It thus calls for taking genuine steps to analyse EST students' needs, design effective EST programmes in Iraqi science faculties and provide them with well-trained EST teachers.

CHAPTER ONE

Theoretical Bases of a Communicative Approach to Foreign Language Teaching

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1.1 Preliminaries

It is discernable that the last decade has witnessed great changes in the field of foreign/second language teaching and learning in which developments have taken place so rapidly and on a large scale. Undoubtedly, novel insights in research work in applied linguistics, sociolinguistics and psycholinguistics are pushing forward the field of foreign/second language into a period of rapid development and systematization. Actually, the present era of language teaching and learning should involve changes in teaching pedagogy and techniques in order to meet the needs of the new teaching situation.

Presumably, development in sociolinguistic theory, pedagogical practice and the increasing demands of the society over the last fifteen years or so has made methodologists, language teachers and educational personnel more aware of the relationship between the communicative needs of the learner on one hand and the unavoidable constraints imposed on him such as his situation, setting, background, and the language material of the target language he has to deal with on the other.

...for language will be seen as changing by its nature by the uses to which it is put: the process of change will not be seen as deviant when the nature of change is more fully understood (Brumfit, 1980 a:163).

Actually, a great deal of attention is currently being devoted to the notion that what learners strive for is to use, after all, the target language as an instrument of communication rather than as the embodiment of a formal system. This premise has, in effect, led to giving much prominence to syllabuses which devote much more attention to varieties of communicative use but a subsidiary role to the teaching of the grammatical properties of the target language.

It suffices to say at this point that we still do not know enough about the way language is used to reject mutability in our methods of teaching (cf. Rivers and Temperley, 1978: vii). In fact, the field of language acquisition is badly in need of more serious research than it has been done so far, particularly in foreign/second language acquisition on the text level where the problem is still intricate and diverse. Indeed we have not got very far yet in language teaching/learning process despite a considerable body of experimental research and speculation in language pedagogy. Certainly the time for the full scale pedagogical application of a one dominant language teaching approach is not yet nigh.

Actually as we devise more and more language teaching techniques and activities we discover that language learning is more complex than we had thought. This, of course, would lead us to approach new problem areas which require understanding and solution (Littlewood, 1983: 200).

Our present state of knowledge about language and language learning is such that it would be irresponsible to be anything but tentative. But it would be even more irresponsible to avoid investigation and to pretend that there are no problems (Widdowson, 1978: X).

My idea is that unless we attempt to provide adequate theoretical basis backed by pragmatic studies for what the nature of the function of language is, it would be difficult to suggest adequate materials and techniques for meeting the specific needs of the learner: an assumption which constitutes the common core for current communicative-orientated methodology.

Despite the aforementioned arguments which, simply, imply that some problems still hamper communicative teaching programmes, particularly at earlier stages; however, one should concede that recently the language teaching fraternity has entailed a variety of rigorous pragmatic attempts that have answered some of the current practical needs of language teachers and learners (see for example Widdowson, 1978; Munby, 1978; Johnson and

Morrow, 1981; Littlewood, 1981; Oller, 1979; and Carroll, 1980).

Since in this study I am going to adopt a communicative-orientated approach, I feel it is of crucial significance at this stage to shed some light on the profile components of the communicative curriculum and the premise of the communicative method which relates coherently to the procedures and techniques employed to fulfil the course objectives (see Morrow, 1981: 59). However, it should be borne in mind that our assumed method of teaching, in order to satisfy the objectives of the course, should be both faithful and realistic in terms of learners' needs and relevant to the aims, aspirations and constraints of the country in which the programme is to be applied.

1.2 Some Background

While pre-Chomskyan approaches to language teaching and learning emphasised the teaching of the language system by means of audio-lingual drills and certain structural techniques mainly based on habit formation and over drilling, the Chomskyan approach stressed the acquisition of underlying linguistic categories and systems (deep structures) from which surface forms (surface structures) are derived through the application of transformational rules which are considered of a universal type (see Chomsky 1957, 1965).

Therefore, the main focus in course design shifted gradually from vocabulary centred materials to structure centred ones in the 1960's. That change was, in effect, due to Chomsky's emphasis on the significance of syntax which, in fact, was an elaboration of the structural theory of language of the 1940's, but Chomsky looked at language structure from its deep level, namely deep structure. Therefore, Transformational Generative Grammar contributed very little to the findings of the structural approach related to Language teaching because it treated language teaching on the same principles, i.e., grammar remained the centre of the issue, but it offered "alternative strategies for teaching grammar - new ways of teaching the same thing" (Brumfit and Johnson, 1979:3). But the aforementioned argument should not by any means ignore the fact that Transformational Generative Grammar theory "provides many insights into language as the product of the human mind" (Stevens, 1980:47).

Broadly speaking, the teaching era of the sixties has focused upon mastery of language structure on the sentence level rather than on language use. This type of methodology is clearly manifested in the task of syllabus design, language teaching techniques and assessment. As far as structural methodology is concerned selected and contrived structural items are graded in suitable order to be presented, drilled and then practised in context (see Brumfit, 1980:121).

Students are, simply, assessed in terms of ability to manipulate the structures of the language paying very little attention to meaning.

However, discontent with the existing predominant language teaching of the sixties began to come to the fore. It is crucial to note that discontent evolved first from the upholders of the structural approaches themselves (see, for example, Rivers, 1964:100 and Smith, 1971:2).

The linguistic scene in the mid-sixties began to look on semantics and the elements of meaning in structures as a new field which is worth investigation. Linguists such as Katz, Fodor, Ross, the Lakoffs and McCawley were interested in semantic description of the sentence. Therefore, interest in presupposition behind clauses and some contextual constraints on meaning led to increasing problems in Chomsky's syntactic model (Sinclair and Coulthard, 1975:2). Thus, the focus of debate among the transformational grammarians themselves led to criticism of its theoretical position, and at the beginning of the 1970's the sociolinguistic approach to language began to influence the scene of language study (see Hindmarsh, 1980: vi).

In fact, Chomsky's main concern is with the notion of grammaticality of the language structure rather than the appropriateness of the structure itself in a certain contextual environment; in that he purports (see Chomsky, 1965:4) that the goal of linguistic theory is the description of the grammatical competence of the native speaker-hearer's knowledge of his

own language. Apparently, Chomsky has restricted the concept of competence to cater for only the grammatical knowledge of an ideal speaker-hearer in a homogeneous milieu.

Hymes (1972:278), and Campbell and Wales (1970:247), however, have shown these limitations in the Chomskyian formulation of competence and stressed the significance of communicative competence rather than grammatical competence. Hymes, in particular, has coined the term "Communicative competence" to refer to a person's ability to adapt the structure and meaning of language to the structure and meaning of the social context in which it occurs. Thus Chomsky's definition of competence seems too narrow as linguistic theory should concern itself with communicative competence which refers to the speaker's ability to communicate appropriately in a natural social situation. This, of course, implies that the speaker already masters the grammatical aspect of the language if he acquires communicative competence as grammatical elements constitute only one portion of that competence. Hence, Hymes being an anthropologist and sociolinguist looks at language from a sociolinguistic point of view whereby a sociocultural evaluation of a language user's, is central to his language competence.

In fact, Hymes (Ibid:281) purports that a native speaker's communicative competence reflects his

grammatical, psycholinguistic, and sociocultural knowledge and ability to use language. Therefore, Chomsky's "Grammatical Competence" represents only one sector of the parameters of communicative competence of the native speaker of the language. This implies that appropriate and effective communication requires more than linguistic competence.

Hymes also talks about another type of language description (see Coulthard, 1977:31) which he calls "the ethnography of speaking" which he says is concerned with "rules of speaking" in a certain social group. Thus, the actual theory of communicative competence which Hymes (1972:281) suggests constitutes the following tenets which view communicative competence as an interaction of various factors; psychological, grammatical, and sociocultural.

1. Whether (and to what degree) something is formally possible.
2. Whether (and to what degree) something is feasible by virtue of the means of implementation available.
3. Whether (and to what degree) something is appropriate (adequate, happy, successful) in relation to a context in which it is used and evaluated.
4. Whether (and to what degree) something is in fact done, actually performed, and what its doing entails.

On the other hand Halliday (1972) following Firth (1935) and Malinowski (1935) has developed a socio-

semantic approach to language description. He is also interested in emphasising language use in social contexts, but to him language is performed through semantic options derived from social behaviour (see Halliday, 1972:27). Though Halliday's notion of "meaning potential" has its significance in pedagogy, his analyses of language texts have been restricted to the clause and below (see Sinclair and Coulthard, 1975:9).

However, it is to be noted here that Halliday was Firth's interpreter. But while Firth emphasised meanings in contexts almost ignoring syntax, Halliday has developed an approach to syntax and grammar system which was lacking in Firth's theory. Halliday has, in effect, aptly developed novel lines of thought, particularly in his studies of intonation and the thematic organisation of language (see, for example, Halliday, et al 1964, and Halliday and Hasan, 1976). He also directed attention to the significance of semiotics in language theory which should have due concern in language analysis and language teaching pedagogy (see Halliday, 1978).

Undoubtedly, it was Hymes who inclined recent teaching research towards communicative competence as a new notion which is worth investigation. He points out (Hymes, 1972:278) that "There are rules of use without which the rules of grammar would be useless". Therefore, looking at language as related

to context, purpose and later on as a means of communication has geared emphasis in teaching methods and syllabus design away from the grammatical syllabus and then situational syllabus (Wilkins, 1972) to what Wilkins (1976:18) calls notional/functional and what Widdowson calls the communicative syllabus (Widdowson, 1978, 1979, 1980). Hitherto, emphasis on context, contextual meaning and textual analyses for novel implications in the field of language learning, specifically, foreign/second language learning has become the prime concern of the language teaching fraternity of the 1980's.

In fact, the credit for drawing linguist's attention to context dates back to Firth (1935) and Malinowski (1935). The former, in particular, directed linguists' and teachers' attention to the concept of register and its significance in a context. It is to be noted that Firth was sociologically orientated in much of his linguistic work. He purports that contextual meaning should embrace the formal aspects of the grammar of language, its lexis and its phonology. Actually, Firth's great contribution to the sociolinguistic theory is his initiation to the notion of contextual meaning.

However, register on which methods of ESP material production was based (see Robinson, 1980:16) was first applied to the language teaching field by Halliday et al (1964). Strevens (Ibid) in particular concerned himself with one of the fields of register which he called "field of discourse" and that later on was elaborated by Strevens and other linguists who are

concerned with language teaching such as Gregory (1967) and Davies (1969) into a more definable concept of speaker intentions, namely language functions and communicative functions; the latter being considered as a basis for communicative foreign language teaching especially by Wilkins (1976), Munby (1978), Strevens (1977) and Widdowson (1978).

Recently we have noticed that great emphasis is laid on discourse analysis, particularly classroom discourse for implications in order to improve the theory and pragmatic aspect of communicative teaching. Presumably, "a deeper understanding of the effects of communicative needs on non-native speaker discourse" would give us a true picture of our students' difficulties in using the target language (Richards, 1983:119). Undoubtedly, the development of communicative syllabuses relative to learning English for specific purposes has increased the importance of the application of discourse analysis (see, for example, Sinclair and Coulthard, 1975, Widdowson, 1978, Coulthard, 1977, Brazil et al, 1980). In effect, studies of discourse analysis would lead to understanding of the rule systems that operate above sentence level⁽¹⁾, i.e. discourse both within the language and the environment which has its own situational constraints to impose on discourse organisation.

Discourse analysis should not only be able to illuminate the study of written texts, but also provide explicit links between written and oral language, and between receptive and

productive roles. (Sinclair, 1980:254).

Therefore, there is a need to look with considerable hope at experimentation with discourse analysis in the classroom, particularly, foreign language classroom, whereby useful implications about the constituents of interactions between speakers and the organisation of discourse may be revealed.

1.3 Communicative Course Design

The components of any teaching/learning course such as objectives, syllabus design, evaluation, teacher training, etc., are, in effect, closely inter-related. Therefore, when a need arises to reform an existing course, all components of the course should be assessed as one unit (cf. Hooper, 1971:119). Such a global view of the course requires a well-thoughtout idea before steps are taken to deal with its categories. However, when a decision is taken to refine the course the focus of emphasis should be the learner. In fact, traditional courses are usually imposed upon the teaching/learning situation as they pay very little attention to the actual needs of the learner and the limitations of the educational institutions. Modern courses stem from the needs of the learner and the social constraints imposed on him and on the teaching/learning situation.

...trends in ELT .. in the latter part of the 70's have greatly widened the scope of the syllabus design, and we are now all more sensitive to the characteristics of the learner, his needs, his wants, and the wider society in which we work.

(White, 1983:80)

1.3.1 Communicative Syllabus Design

It is discernable that language teaching is a theoretical activity as well as a practical one. Therefore methods of teaching and course design should depend heavily on the way language works, is acquired and used in real life situations as well as on the needs and expectations of the learners from learning that language. Therefore to delve into the nature of language complexity and to have built-in-evaluation mechanism as well as broad evaluation procedures which depends heavily upon the social needs of the society, the learner's needs and expectations of life and of the course itself, and the constraints imposed on learning the target language are the ways which would lead course designers to specify the exact aims of the teaching/ learning process and that would in turn lead, hopefully to the possibility of designing an appropriate course.

Presumably, syllabuses are directly linked to the methods of teaching adopted for certain courses as syllabus organisation should be coherently linked to the premise and purposes of a teaching course. Of course, by syllabus organisation is meant "the whole

process of organising and specifying what is to be taught in a body of materials, or in an educational institution, in order to enable the learning of a language to be as effective as possible (Brumfit, 1981:90).

However, traditional foreign language teaching has put heavy emphasis upon the grammatical structures of the target language rather than the up-to-date functions of language. In other words, the focus of the traditional teaching/learning activity has been on isolated sentences and vocabulary items rather than on texts or discourse organisation; and on formal correctness at the expense of successfully communicating in the target language. Obviously, the data provided to the students would lead them to learn facts about elements of language structure and demand of them to subconsciously use the target language in meaningful situations without providing them with the adequate authentic language materials which could help them build communicative attainment.

It is to be noted that the concept of what constitutes difficulty and easiness which is held by the upholders of the communicative approach is not the same as that held by the upholders of the pre-communicative approaches. Whilst in the pre-communicative area grading depends upon the difficulty and easiness of the vocabulary and grammatical structures, the communicative language courses are graded on the

difficulty and easiness of tasks to be carried out by the learners. The difficulty of the task depends on performance requirements which depend on conceptual, cultural as well as linguistic level of the material (Xiaoju, 1984:6).

Wilkins (1972:83) and Widdowson (1972:119) argue that the grammatical syllabus proves unable to supply the learners with the necessary conditions for the acquisition of communicative skills. Wilkins (op.cit., 82-3) poses the following weaknesses for the teaching methods that depend upon the grammatical system of the target language rather than on the communicative properties.

- i. They reduce the motivation of the students who need to see and be encouraged by the immediate practical results of their learning.
- ii. Since the aim of those methods is to teach the entire system regardless of the fact that not all parts of the system will be equally beneficial to all learners.
- iii. They emphasised grammatical form and grammatical meaning will be subordinate to it.
- iv. Emphasis on the grammatical relation between sentences makes language seem highly artificial since in real life communication what makes sentences together is not that they are alike in structure but in meaning.

Experimental studies done by Palmer (1974), Tucker (1974), Upshur (1969) and Savignon (1972) as cited by Canale and Swain (1980:12-13) have shown

that emphasis on grammatical performance in the classroom is not a dependable predictor of achieving communicative performance. Segalowitz (1976) (see Canale and Swain, 1980:33) has pointed out that learners who had only grammatical training in the target language had negative attitudes towards the target language and its speakers whenever they are required to interact with them in that language. Segalowitz purports that negative attitude could be a result of the learners' incompetence in the communicative skills in the target language.

It is also worth noting that second/foreign language research has been moving from emphasis on syntactic and morphological rules to strategies of language in use in order to meet the needs of communication in the second/foreign language (Rivers, 1980:56). It seems however that both sociolinguistic competence and linguistic competence are crucial to the interaction process.

...effective communication entails two things: linguistic accuracy and sociolinguistic appropriacy. Inappropriate performance, even if it is perfectly accurate linguistically, can never be really effective as communication, not only because it doesn't produce the desired effect, but also because it sometimes produces the opposite effect. (Xiaoju, 1984:12).

Hence, establishing communicative attainment has become the prime concern of the communicative approach. But in order to be communicative, language should be meaningful as without meaning, there will be no communication. Therefore, a foreign language should be learnt according to the specific communicative needs of the learner, i.e., the main task of foreign language teaching in a communicative methodology is to develop competence in foreign language learners in those areas in which they are in need of developing competence. However, the kind of competence that is required differs from a group of learners to another (see Yorio, 1980:433) Thus, classroom activities in a communicative syllabus design should concentrate on those communication activities which the learner is most likely to engage in. (2)

The communicative approach, since it focuses on the social functions of the target language, would cater for the learners' requirements in terms of the learners' relationships with his interlocutors. This implies that the specification of communicative needs of the learner should precede the selection of language functions and communicative acts to be taught.

Traditional syllabuses rely on language content which is derived from a target repertoire devised prior to the teaching/ learning process. Those materials, often linguistically based, are predicted

to meet the needs and expectations of the students to whom the course is organised.

Pre-communicative language approaches look on language teaching as a 'knowledge-imparting' process, and language learning as a 'knowledge receiving' process. This is because those approaches regard language learners as passive recipients. But the communicative approach treats language learning as a developmental process whereby students grow and mature in order to play a useful role in international communication which would go far beyond mere linguistic exchange.

The syllabuses in a communicative methodology is looked upon as provisional. The content of the communicative syllabus is refined, developed, segmented and organised according to some adopted criteria which should stem from the pragmatic teaching/learning process. A valid content is that which focuses on knowledge significant to the learner, motivating personal negotiation with one's self and with other members in a milieu, and facilitates integration of the language code with knowledge and experience of the materials and of life in general. Hence, communicative syllabuses don't impose themselves on the learners as some external control, but they would be subject to negotiation and evaluation from the learner himself. This point would, obviously, help communicative syllabuses have built-in evaluation mechanisms which would eventually lead to serve the requirements of the communicative

needs of the learner and would also lead to a continuous assessment and development of the syllabus itself.

I believe it is a major priority to help our students, particularly advanced students in formal classroom settings, to analyse, criticize, predict and describe the world around them in the target language. Whether to be able to converse communicatively or read and write creatively in the target language should depend on their own specified requirements. In short, those are the objectives of a communicative language course.

1.3.2 The Role of The Learner in a Communicative Approach

Within a communicative approach the learner has an active role. He is not only receiver of knowledge but a contributor to the language course. His expectations of the course should be taken into consideration, particularly those expectations which are conducted through out the teaching course. Therefore, the learner would refine the teaching course through negotiating the strategies adopted in the course. He would be able to act as an informant to the teacher and course designer in order to reconstruct the course to suit his own needs and abilities. Thus, he would give the teacher and course organizer some clues about the ways he would learn the target language in a better way.

The learner in a communicative approach is expected to exploit independent strategies in order to learn and develop his own learning strategies and decide on different routes whenever available to

maintain his personal motivation. Therefore, he should depend on his group or classmates and/or the teacher as well as himself to achieve that goal. Hence, the learner can offer the teaching/learning process novel directions in teaching and learning by performing the role of a teacher or a member in his group and the role of an informant to the teacher and course designer.

.....the communicative approach demands a high degree of initiative from the learners. They are active agents throughout the process.
Mechanically formed habits are only skin deep whereas communicative competence is something that involves the creative functioning of the mind. And only one's own active efforts can ensure the development of such a competence.
(Xiaoju, 1984:10).

In a communicative course design much attention should be paid to marked individual differences among learners such as pace, learning strategy, attention span and performance for learning by a certain medium of learning (cf. Hooper, 1971:121). Of course, course planning must take into consideration the needs of the social group of the learners, the needs of the institution to which the learners belong in addition to the needs of the learner himself. Given that a programme of needs and motivation analysis should precede the identification and specification of the objectives of any teaching course, such a

programme should be as accurate and precise as possible (Richterich and Chancerel, 1977:vii).

But how can our programme of needs and purposes be as accurate and practical as possible? presumably, we would achieve that goal by establishing as many of the relevant aspects of the learning process as we can while still focusing on the learner's needs, motivations and other variables such as intelligence, learning style, experience, age and expectations. Actually, a practical analysis would be that which takes into account that such partners are not constant and they would be, apparently, affected by changes in circumstances which may sometimes impede projection. However, flexibility to respond to such changes through a well-designed programme and continuous monitoring would, eventually, lead the project to the shore of success. Therefore in order to design effective courses for English language teaching, for instance, we have to understand well what the learners need to use English for. Of course, we have to be aware of the amount of knowledge and mastery of the foreign language required by the learner to perform a specified task. Therefore, to determine accurately the specific purposes of the learner is something invaluable for the process of translating the learner's needs into linguistic and pedagogic terms so as to produce an effective language course. Thus, when

needs are clear, particularly with a specific educational aim in mind, teaching objectives and course materials can be defined in terms of these specified purposes to which the language will be employed (see MacKay and Mountford, 1978:3).

Practically speaking, it might be difficult to provide every learner with a specific course to suit his particular needs, but hopefully a learner-centred syllabus should try to offer as wide choice as possible so that each learner can find some facilities, information and training that would suit his expectations and requirements and help him get the best from the course.

In fact, in a communicative approach the classroom teaching/learning activity would be based on student co-operation and responsibility which, apparently, would lead to building up the student's self-esteem in his learning rather than being totally dependent on his teacher's knowledge. Hence, most of the classroom interaction will be transferred from a teacher-directed to a peer-centred activity.

If we think that communication is of paramount importance and if we set it as a worthwhile objective, we must give the learners as many meaningful opportunities as possible for real communication and create an environment and an atmosphere which facilitate and optimize authentic use of language in the classroom (Weiss, 1981:5).

Hopefully, through communicative activities such as group work techniques, the student will be able to start communicating in the foreign language in a way which helps him to integrate his personality into his communication, and the language materials he uses will become internalised and almost natural and spontaneous.

This implies that in order to develop students' communicative competence they would be given the opportunity of using authentic materials as well as given the opportunity to authentically communicate in the classroom (Johnson, 1983:55).

Therefore, in a communicative course design the classroom will be a scientific laboratory whereby the teaching/learning activity would become a means for the discovery of novel knowledge and the attainment of new language skills in that it makes use of the communicative potential of the classroom in all its resources, namely teachers, learners, texts, media etc.

1.3.3 The Role of the Teacher in a Communicative Approach

Within a communicative approach the teacher would be organiser of the teaching/learning process, a resource of knowledge and feedback, as well as a researcher and learner from the classroom activity as a pragmatic scientist. No doubt, the teacher in a communicative methodology may sometimes find himself involved in an individualised teaching process in which he is needed to work with those who work at a different pace from others.

However, in group work which is one of the effective communicative techniques, the teacher's role will mostly be concerned with facilitating the communicative process among the members of the group. The teacher will also function as a guide within the classroom procedures and language activities. So, his role will be a mixture of guiding and monitoring the groups as well as being a contributor of appropriate knowledge and abilities (Breen and Candlin, 1980:99). Obviously, the teacher would direct a certain discourse in any group, speak whenever he sees it necessary to speak, interrupt some groups to comment on the relevance of their contribution to the topic they are discussing and so on.

Contrary to Salimbene (1981:89) who claims that in a group work technique, the teacher may feel redundant and it may make him 'the directed' rather than 'the director' (Ibid:92), I feel that the teacher in group work activities remains the director, the main source of knowledge and 'the authority' in classroom work and he should remain so. I believe that the classroom democracy demands that position of the teacher. I think that any so called teaching activity which makes the teacher become redundant will lead to chaos rather than to democracy and effective learning.

Given that the teacher's main role in a communicative course is to help students develop communicative attainment, this point, of course, demands on the part of the teacher to have a fairly high level of communicative ability in the target language and in the communicative techniques adopted in order to carry out his task effectively. This demand in turn requires teacher training courses to have new orientations in order to meet those demands.

If then it is thought desirable that new syllabuses should be set up and new methods adopted, it should only be done in conjunction with a programme of retraining. In short the qualities of language teachers define the potential limits of achievement of their pupils. (Wilkins, 1974:54).

1.3.4 Communicative Techniques

Learners' individual differences bring individual contributions to the teaching/learning process. Their different degrees of communicative knowledge and their varied abilities require from the learning process to provide varied facilities and diverse teaching techniques in order to help students achieve the required communicative attainment (cf. Rodgers, 1978:253). Therefore, the communicative course would cater for that differentiation among the learning strategies of the learners by exploiting different kinds of teaching techniques which a communicative approach is hopefully supposed to offer to the language teaching process.

In fact, communicative language teaching has presented us with new emphasis in TEFL/TESL namely group work, peer teaching, role play, simulation techniques, etc., Those teaching devices actually involve the learners in activities which are interesting and which motivate them to use the target language communicatively.

Despite the fact that those communicative activities could also be affected by classroom constraints and conventions, they would change the classroom into a meeting place for communicative learning whereby "knowledge is jointly offered and sought, reflected upon and acted upon" (Breen and Candlin, 1980:98). It is crucial to note that among classroom activities in a communicative approach to language teaching are role-play and simulation which can reduce the artificiality of the classroom and provide opportunities and reasonable motivation to the students, particularly adult students, to talk meaningfully to each other in the classroom. Apparently, the classroom would seem artificial only if we overestimated its interaction and contribution to the teaching/learning process, particularly in foreign language teaching situations.

Generally speaking, in a foreign language teacher-centred class only one student speaks at any time. This means that with a class of 40, two-thirds of the students on average would have no chance to speak in any teaching period. In a group work activity every

student would be constantly active, have enough time to spell out his ideas in the group and would be unlikely to get bored or distracted. In fact, a wide range of language functions can be practised through group work inside the classroom. Those functions could be either real or unreal, but they should attract the learners' imagination and suit their age and needs.

Moreover, group work techniques would make students live, learn, work and play together and absorb democratic values as they learn. This would help them and their teachers to discover the difference between imitation and creative self-expression (Paton, 1981:8).

Presumably, the focus of attention in group work which moves away from the teacher who no longer overtly directs but acts mostly as informant, demands greater skills on the part of the teacher to keep lessons active and interesting. Of course, managing successful group work is, in effect, a highly skilled operation which requires explicit training. Therefore, the training course in a communicative course should educate and train the teacher to be co-operative in peer teaching situation in order to be ready to work in such non-formal classroom activities whereby the focus of attention and students' communication are directed towards their peers rather than towards him. Teachers should also be trained how to control the classroom when there is unnecessary breaking of the rules of speaking according to the

communicative approach ideology in the classroom.

Communication games are, in effect, originally devised for use with adult students learning a foreign language (see British Council, 1979). But those games can also be adopted for use with students of different ages and in EFL situations on condition they have already mastered the basic structural elements of the target language i.e., when the complete beginner stage is over.

Contrary to the traditional types of activities in the classroom which depend heavily upon uncommunicative structural drills, so to speak, which have little transfer value to real-life language needs and situations, communicative games and role-play games cover a wide range of classroom activities which would provide interesting and specific language use activities as well as stimulating communicative dimensions such as guessing and thinking to find clues. There are some communication games which are of crucial importance to adults and would help advanced students express their own personalities and abilities. Those effective games which are employed for teaching advanced students could be summarised as follows: 'The Interview Role-play' in which students take different roles in the communicative act (see Turnbull, 1981:380). "Dialogue Game" whose aim is to mediate between the structural and functional components of the target language (Pauncz and Elam, 1981:250), "Note-making exercise" which aims at developing the listening and writing competence of the students (Riley, 1975:238), "The

Debate - Type Game" whereby students engage in spontaneous but controlled language production (Edwards, 1981:388). However, I am going to deal in detail later on in this study with communication games and other communicative techniques which would be of benefit to the students of EST in Iraq.

1.3.5 The Assessment of Communicative Performance

Measurement constitutes one of the effective components of the course which is of utmost importance in the process of adopting the principles of the theory of language teaching. Learners and the educational personnel always tend to be affected by the measurement or testing techniques adopted in their country.

In traditional language teaching programmes the testing variable used to dominate the objectives of the course and the language material to be taught as teachers' goal in such a type of teaching is to help their students pass certain pencil and paper examinations. Therefore the interrelationship of the course components would be looked upon as something like diagram (1) below in which measurement dominated the other two variables of the language course.

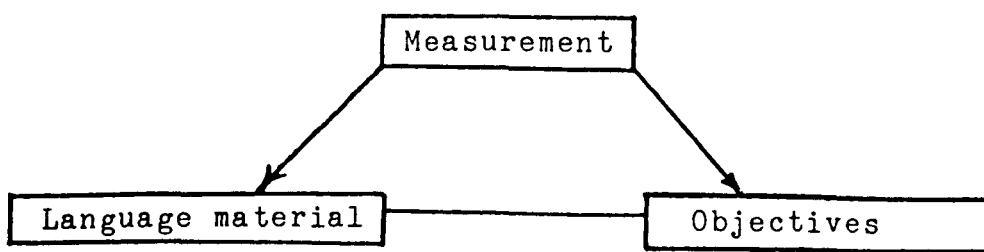


diagram 1

However, in designing a communicative language course much emphasis should be placed on the role of the testing procedures which are linked to the communicative needs of the learner. For instance, if our aim is to develop into a group of EST learners a communicative reading attainment in science texts, our testing techniques should also place a greater emphasis on enhancing and validly assessing that activity.

If the view of language changes to one concerned with the communicative properties of language use, then our ways of evaluating learner's competence to communicate must also change (Oller, 1979:xvii).

Recently, course designers consider language use and communicative needs as the main objectives of any foreign language course. Thus curriculum theories present course design components and relationship between testing and objectives as shown in diagram (2) below (after Carroll, 1980:5).

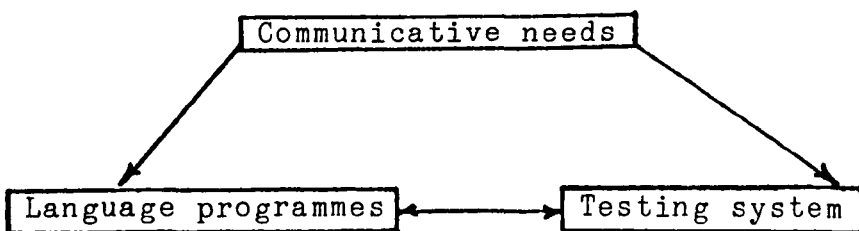


diagram 2

The triple relationship in diagram (2) explains lucidly how learners' communicative needs should be of prime concern in the communicative course and how

it should dominate the other variables of the course. In fact, the notion of specific objectives or clearly stated needs has directed the testing system to lay much emphasis on the specification of how a testee requires to use the target language and how could test designers be able to cater for that process and translate it into pedagogical terms.

In effect, so far, the notion of testing communicative performance has presented many difficulties hitherto to the test designer as it is still not so evident how to differentiate rigorously between formal correctness and communicative effectiveness in foreign language teaching/learning process. But this should not rule out the possibility of trying to look for communicative testing procedures whereby reliable and valid measurement would be achieved to suit the communicative needs of certain groups of learners (see, for example, Cziko, 1981).

1.4 General Evaluation of the Communicative Course

Evaluation is, in fact, a crucial element in the language teaching/learning process. It is so important that any language teaching course could be changed into dogma without having realistic evaluation. The communicative approach believes in on-going evaluation as well as end-of-course evaluation. This kind of evaluation would be lively and would lead to genuine refinement of both the individual learner and the syllabus itself. It could also indicate new directions in which the whole teaching/learning process be moved and improved.

Some course designers look on evaluation as an internal process which stems from the curriculum itself and thus puts evaluation on a par with methodology and objectives, as seen in diagram (3) below, which is formulated by Breen and Candlin (1980:90).

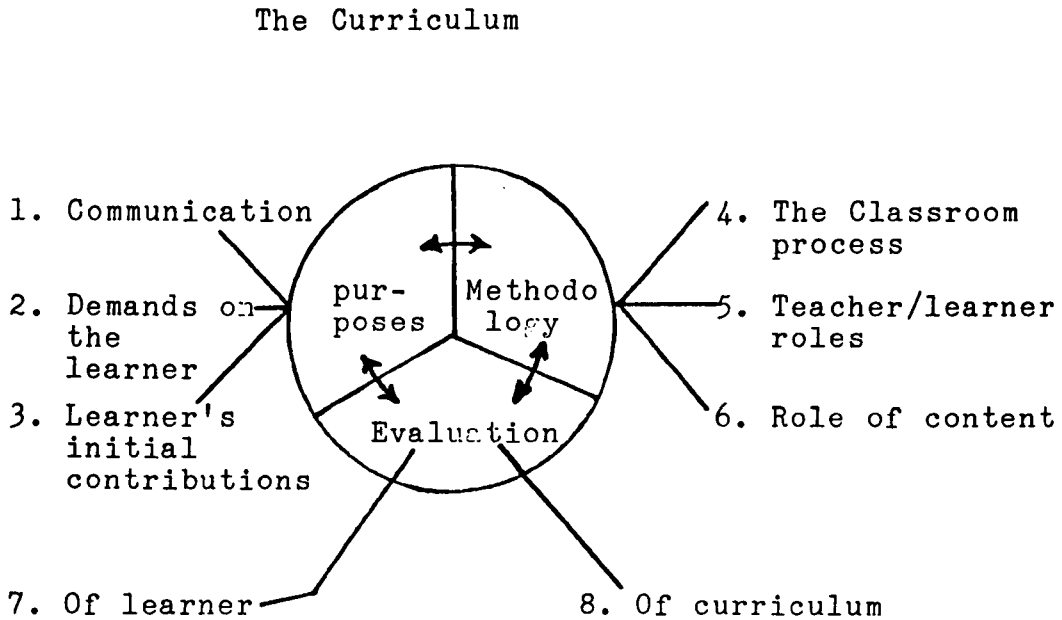


diagram 3

To me evaluation is of two types: built-in evaluation, which I call measurement, as I believe it 'measures' the success and failure of the teaching process, namely materials, teacher and learners with a fixed and ready-made scale which always suits the principles outlined in the objectives of the course or the principles of the methods adopted: and dynamic evaluation, which stems out of the actual developing needs of the society of the learner and the continuous development of the linguistic theory and other factors which usually stem from sources outside the framework of the curriculum itself. It is

clear that discrete point tests measure structural courses and pragmatic tests aim at measuring communicative performance (see Oller, 1979:37). In effect, those are measurements for measured courses and measured objectives. Therefore, I think that evaluation should be in a higher rank in the process of language teaching. Accordingly, I would see the relationship among the language course components as in diagram (4) below

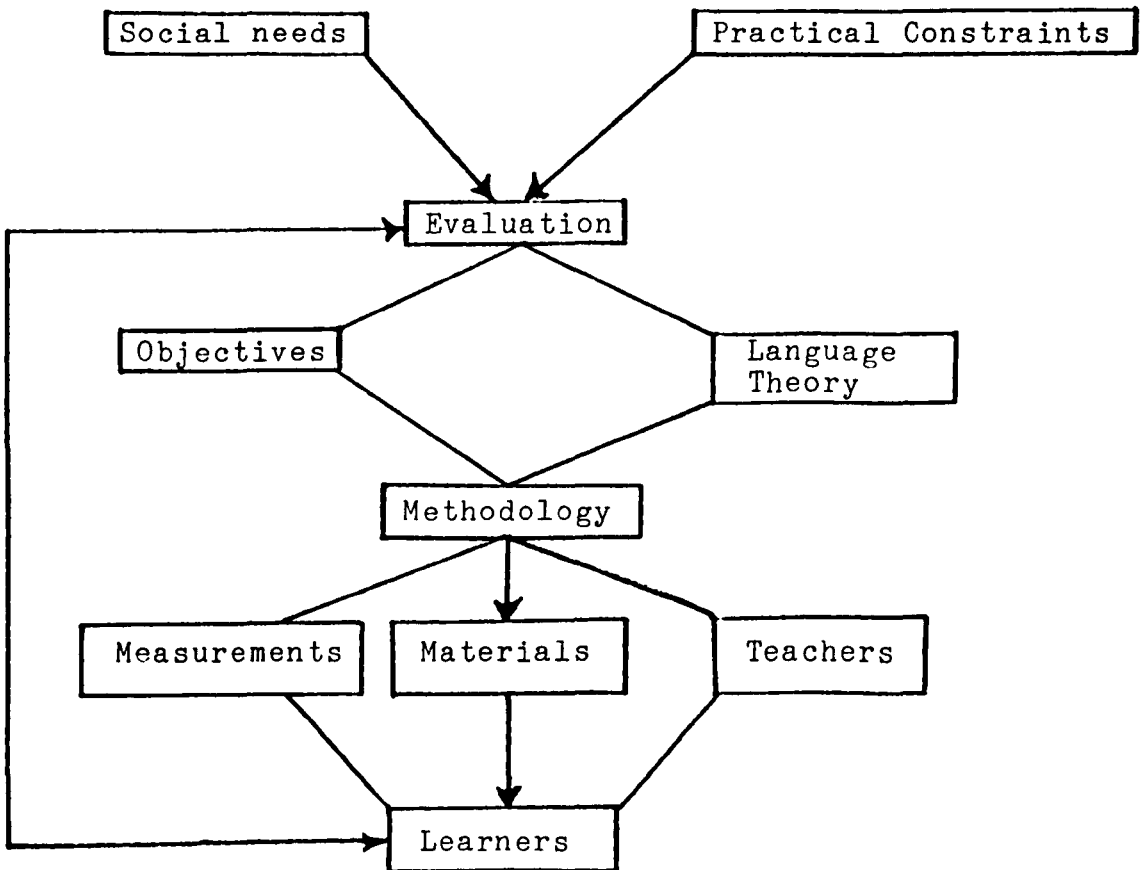


diagram 4

However, since social needs and the practical constraints are in a state of continual change, evaluation also changes as it is a relative variable. Thus, consequently, other components of the teaching/learning process change or are modified so as to cope with the social needs in which the course is adopted. The ESP courses are good examples of the effect of social needs on language teaching/learning process. Therefore, when we attempt to prepare an EST course for university students in a certain country, we should first look at the social needs of that country and the practical constraints imposed on the teaching/learning process there; otherwise the course we prepare would change into dogma. Therefore, in trying to develop our communicative language teaching we should not rush to adopt ideal principles or certain teaching techniques just because they are up-to-date or they succeeded somewhere else, but we should be aware of the recognised needs of the foreign language teaching process in that country, particularly in countries where formal classroom settings dominate the scene of language teaching and where society, culture, education and even their knowledge of the world are different from the country of the target language.

Munby (1978:217) points out some interesting constraints on syllabuses specification which I think should be taken into consideration when attempting to develop English courses in Iraq. Those points are as follows:

1. Socio - Political
attitude of government; status of English
(optional/compulsory, medium/subject); expect-
ations of institution/society; decisions on
timing (viz. when to start); etc.
2. Logistic
number of trained teachers; accommodation;
amount/suitability of equipment; extent
materials; money etc.
3. Administration
quantity, intensity, and mode of instruction;
time-table; etc.
4. Psycho-pedagogical
learner's motivation and expectations; traditional
styles of learning etc.
5. Methodological
recommended language learning strategies and
language teaching techniques; order of items
and organisation into teaching units; selection,
adaptation, and production of suitable materials
etc.

However, it is to be noted that any teaching course should be open to negotiation and change or modification. There is no immutable course in the communicative methodology which represents a social arena. Therefore, the communicative course would be considered as a set of flexible principles which would be validated in actual classroom situation and in the light of development of language theory. Moreover,

the objectives of the course are also subject to change since they are directly linked to people's needs and purposes which in turn are liable to change as a result of our changing world.

Communicative curricula need - through time and according to situation - to be open and subject to ongoing developments in theory, research and practical classroom experience (Breen and Candlin, 1980: 107).

However, the current communicative orientated field of foreign and language teaching is in need of rigorous researches to be carried out in the following dimensions (Canale and Swain, 1980: 36):

- i. description of the communication needs of a given group of second language learners based both on factors particular to the learners (e.g. their age, background of instruction in the second language) and particular to the speech community (or communities) in which the second language is most likely to be used (e.g. what peers talk about most often, what grammatical forms and communicative functions they use most frequently among themselves and with non-native speakers or strangers);
- ii. study of the minimum level of communication skills in the second language needed by teachers to ensure effective use of a communicative approach at a given stage;

- iii. development of classroom activities that encourage meaningful communication in the second language and are administratively feasible;
- iv. identification of the advantages and disadvantages of the use of authentic texts in addition to or in place of contrived texts at different levels of second language study; and
- v. development of test formats and evaluation criteria that guarantee the optimum overall balance among reliability, validity and practicality in assessment of communication skills.

Notes Related to Chapter One

1. In this study 'sentence level' refers roughly to the structural unit of language which is smaller than discourse level (see Crystal, 1980: 319).
2. It is worth mentioning that classroom discourse would differ from free discourse interaction in that the former's aim is to instruct and inform, and that is apparent from the structure in which classroom discourse is organised. In a classroom discourse it is the teacher who chooses the topic, subdivides it into smaller units and copes with misunderstandings (Coulthard, 1977:101). Moreover, in a classroom discourse, the teacher being the symbol of control is mainly responsible for many exchanges in the classroom such as initiating, informing, directing, eliciting and closing up. This degree of control which is almost always noticed in classroom interaction would

not be noticed in free discourse interaction whereby the participants would have equal rights to divert or even close up a conversation. Therefore, in EFL situations exposing learners to free discourse in the target language would be of great benefit in order to put the FL learner in the true picture of the target language.

CHAPTER TWO

ESP: Theoretical Perspectives

CHAPTER TWO

ESP : Theoretical Perspectives

2.1 Preliminaries

The mid-sixties and the seventies have witnessed immense changes in the field of language teaching, particularly foreign language teaching. In effect, the greatest effort in teaching English as a foreign language has been concentrated on general English.

When discussing alternative possible language teaching perspectives, one notices that the present era of TEL is being geared towards the notion that the teaching of a language can be matched to cope with the specific needs of the learner since the target language is increasingly perceived as serving instrumental goals (Robinson, 1980: vii). This implies that ESP is directed mainly to the acquisition of a certain body of knowledge or set of skills, in contrast with "general English", whereby mastery of the target language and the language system itself are the subject and the purpose behind learning the course. Hence, the process of language teaching and learning remains concerned with general aims no matter who the learner may be, in effect, focused on the specified needs of the learner or a group of learners.

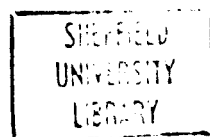
Thus, where in 1970 the great majority of EFL was provided as "general English" ... in 1980 this generalised EFL provision is declining in many countries while at the same time there is building up a more-than-proportionate increase in demand for and provision of "functional Englishes" or ESP (Strevens, 1980:105).

Therefore, this implies that the special purpose of the learner and the learner's ambition and aspiration for the target language form a corner-stone in the success of an ESP programme. A corollary to this is that language is being viewed in terms of what the learner does with it, i.e., in terms of its function (cf. Wilkins, 1972 a:12). Given that ESP students are constantly and mainly in need of everyday life explicit acts of analysing, defining, identifying, comparing, differentiating and classifying (Macky and Mountford, 1978 b:129), the kind of ESP data provided to them would concentrate on the above functional language events. Actually, what matters most to us in terms of teaching ESP is the communicative value of the language used by the learner, paying much attention to communicative appropriateness and grammatical correctness as well. Of course, ESP students would be more capable of understanding and composing the target language on the text level if they would move away from strictly sentence-based analysis and be allowed to use, analyse and compose

ESP materials relative to their specialisation on the text level.

Actually, ESP represents a good match between the theory of applied linguistics and practical classroom needs. The reason behind the great demand towards ESP is undoubtedly an increase in demand towards functional English. Perhaps ESP may be the target of any language course in the near future. Breen and Candlin (1980:94) have also pointed out that the current interest in learning ESP may lead learners eventually to consider themselves learning a target language for some special purpose.

In fact, the term ESP (English for Specific Purposes) has been used under several names which have grown up during the last ten years or so. Previously, the term 'English for Special Purposes' was used but it was mixed with some restricted languages which, in effect, constitute certain registers. Then, the term LSP (Languages for Specific Purposes) was also used to refer to a broader notion which includes other languages, such as French and German (Robinson, 1980:5). Actually, despite the fact that specific language courses in other languages, particularly French and German, have provided salient insights in the field of languages for specific purposes, there is consensus in the educational fraternity that most of the specific language courses have been produced in English, i.e. ESP.



However, the increasing tendency towards specification in English language teaching courses and the emphasis on "communicative needs of the learner has offered a rich source for teachers and course designers to the designing of more appropriate courses and materials for learners of various levels and fields of specialisation. Actually, recently ESP has become a major developmental focus in communicative syllabus design. The teaching fraternity has responded attentively to the increasing demands for ESP courses and ESP material production (Munby, 1978:1).

However, the current implications for the factors which geared the study of language, particularly foreign/second language, towards specific objectives and identified needs for studying the target language, specifically English, are summed up by Candlin as follows (see Mackay and Mountford, 1978:viii).

- i. A view of language as communication implies teaching materials which interrelate form, function and strategy, in a methodology which promotes participation by the learner in the process of interpreting meanings.
- ii. Given that the ESP learner sees English as a means to the pursuit of academic or vocational goals, and not as an end in itself, analysis of the specific communicative implications of these goals is a necessary point of departure.

- iii. These restricted objectives and the link to subject matter highlight the integrative place of English and the English teacher in the general curriculum of the institution or the processes of the job.
- iv. The processes of data collection, discourse analysis and didacticisation suggest a unified applied linguistic methodology for ESP course designers, despite the apparent heterogeneity of their communicative purposes.
- v. The extension of 'special purpose language' beyond registerial differences of lexis and structure towards universalist ideas of concepts and reasoning processes may suggest that the much emphasised distinctions between ESP and 'general' ELT are inappropriate and counter-productive.

Given that there are no 'blanket' applications of ESP assumptions and language teaching techniques, an ESP course for, say, Iraqi students studying electronic engineering would not be suitable for Venezuelan students studying the same subject in their own country. Thus, the functional features of a certain situation affect markedly the language material and the skills required in a certain ESP course.

2.2 Advances in the theoretical Analysis of ESP

2.2.1 ESP: Definition and Analysis

Though training of students in some specialised language skills has been in use since the sixties, it

is only in the late seventies that teachers and course designers have focused professionally on the needs of the learners as relatively different from the needs of the general learner of the target language (Robinson, 1980:vii). Presumably, one of the most important factors which led to laying much emphasis on ESP courses was to cater for the needs of the learner.

Broadly speaking, the history of ESP indicates that the teaching of English for specific purposes is not a new one. H.E. Palmer and Michael West were the first linguists who directed teachers' attention to the specific aims of the learners at the beginning of the 20th century (see Corbluth, 1975:11). English courses catering for certain needs of the learner were also pointed out by Firth (1935) and Malinowski (1935) during the period of World War II. Firth in particular directed attention to the significance of context and he coined the concept of 'restricted language' which paved the way to the concept of 'register'. The latter acted later as a basis for ESP (Brumfit, 1977:71).

However, without ignoring the importance of what had been done before in the domain of restricting the repertoire of a certain language to match the needs of a group of learners in order to fulfil a certain role, I believe that Palmer, Firth and others viewed ESP teaching in a different way from today's view. Presumably they looked at scientific and some literary texts as a medium through which they might teach the foreign learner the restricted language or precisely

the restricted code⁽¹⁾ they aimed at. But current ESP programmes look on scientific texts and some literary ones as an end in themselves in which the target language is employed as a vehicle whereby knowledge and information in those texts would be interpreted and grasped.

It is to be noted that when I talk about English for specific purposes, I do not mean a restricted repertoire or a special language, but actually I have in mind the same language employed as a medium for certain aims which would serve the needs and expectations of a certain learner or group of learners (cf. Mackay and Mountford, 1978:4). This implies that ESP is considered as only one variant of ELT.

The afore-mentioned argument implies that clearly stated directions and attention to teaching ESP courses would be plausibly dated back to the beginning of the sixties. Consider, for example, the following report of the Commonwealth conference on the teaching of English as a second language⁽²⁾:

.... in this chapter of the Report, consideration is limited to the special needs of groups to which special attention should be devoted to:

- (a) students proposing to follow a course of study at a university or similar institution using English as a teaching language, in their own country or abroad;

- (b) teachers of English, especially those whose education prior to recruitment has taken place in a medium other than English.

There are in addition many other groups with separately identifiable needs, including, for example, those engaged in or entering technical, scientific and medical occupations (including nursing); the public service, including such large groups as the police and the armed forces; and industry, commerce and journalism (p.19).

Generally speaking, one of the valuable aspects of ESP is that it has geared our attention to achieve a specific end in dealing with the language course. This notion has in turn led us to concentrate our minds on the ways in which we hope to achieve that end. Thus, concentration has been put from the start on the syllabuses and methodology which would help us design an ESP course whereby the needs of the students are hoped to be met. An ESP course would also consider specific language and study skills required by the learner. For example, an overseas student who is spending six months learning English before joining a postgraduate course in electronic engineering in an English-speaking country, will actually be in need of some social English which would help him to be able to use it for social purposes in that community (Kerr, 1977:12). Of course, he will need a register which would help him to go shopping, deal with informal conversations with other people in the faculty, on a bus, in the street, etc. He will also be in need of the academic English germane to his studies.

However, the claims for gearing more attention to ESP courses rather than 'general English' courses, so to speak, rest on the following assumptions (Strevens, 1980:119):

- i. that time and effort will be expended only on that which the learner will need;
- ii. conversely, that no time and effort will be wasted on irrelevant matters;
- iii. that, in consequence, the learning of the target material will be more rapidly achieved;
- iv. that morale, motivation and willingness to learn will be higher than with 'general English';
- v. that success rates will also be higher;
- vi. that in logistic terms a given expenditure on English-language education, channelled through ESP, will be more cost-effective than the same effort channelled solely through 'general English'.

Given that ESP is part of ELT, there is as yet no full specified ESP methodology as such. In ESP teaching, however, an approach which matches specified students' needs may emphasise certain aspects of methodology or certain language-teaching techniques more than others in order to fulfil the objectives of a certain ESP course whereby the needs and expectations of a group of learners would be met.

Recently, ESP, and EST in particular, has become the dominant approach to the process of teaching English as a foreign language all over the world (Mackay and Mountford, 1978:2). However, it is to be noted here that there is still a lot to be done in the field of ESP as the fields of language and language teaching are still in fluctuation and rapid change.

.... ESP is still the subject of much discussion and many issues in ESP remain unresolved (Robinson, 1980:1).

2.2.2 Variables Affecting the Model of an ESP Course

Given that ESP is employed to designate the teaching of English not in general, but with certain restrictions on the course aims, content and skill objectives (Stevens, 1980:32), those objectives, in effect, stem from the various variables which shape the framework of the course. Variables undoubtedly affect the teaching/learning process everywhere, and the ESP course is no exception. Those variables could be divided into two types: external variables, and internal ones. External variables are those that hamper or help the entire ESP programme to reach the shore of success. Therefore the first type of variables would be related to the administrative aspect of ESP, whereas the second one would directly stem from the learner's needs and expectations.

2.2.2.1 The Administrative Aspects of the
ESP Course

By administrative aspects is meant all academic responsibilities of planning, developing, financing, staffing and managing, as well as applying an ESP programme (Al Hamash, 1978 a:3). Improvement of a language programme is, however, relative to experience and principle. Therefore practical classroom difficulties are in constant pressure on teachers and educational personnel to look for new ways to improve the teaching/learning process. That is why syllabuses are still in fluctuation and modification in order to get at more effective and rigorous courses which would meet the needs of various variables including, of course, the learner's needs and aspirations for the target language. But emphasis on those diverse variables vary from one teaching course to another and from one country to another. Hence, in designing an ESP programme, we have to consider the practical limitations and framework of the EFL situation which also dictate the policy to be adopted in ESP.

Munby (1978:217) points out some factors which impinge on syllabus specification and the shaping of an ESP programme (see 1.4, p.34/35). I think those factors should be considered when dealing with designing an ESP programme in developing countries, and Iraq, of course, is no exception.

Therefore designing an ESP programme is not an easy task to do because the success of the programme depends on various factors as mentioned, and on collaboration of curriculum planners and other educational personnel. Jones and Roe (1976:18) point out five basic problems for the ESP programme designers as follows.

- i. The first problem deals with the ESP needs of the learners and the adequate procedure to be adopted to diagnose those needs.
- ii. Before specifying the objectives of a specific programme, the course designers need to identify the critical variables that impinge on the success of the programme. In order for those variables to cater for the theoretical model on which the teaching course is to be drawn, they should deal with linguistic, psychological, social and educational aspects, taking into consideration the setting in which the course is to be adopted.
- iii. The third problem concerns itself with getting at effective ESP objectives, particularly those that would help the programme satisfy the cognitive, communicative and linguistic conditions to be met.
- iv. The fourth problem deals with designing evaluation and measurement techniques which would help ESP designers to see how far the

objectives would be realised. In the light of the results of that evaluation, the envisaged discrepancy would be attached by the help of testing expertise and pedagogic experience.

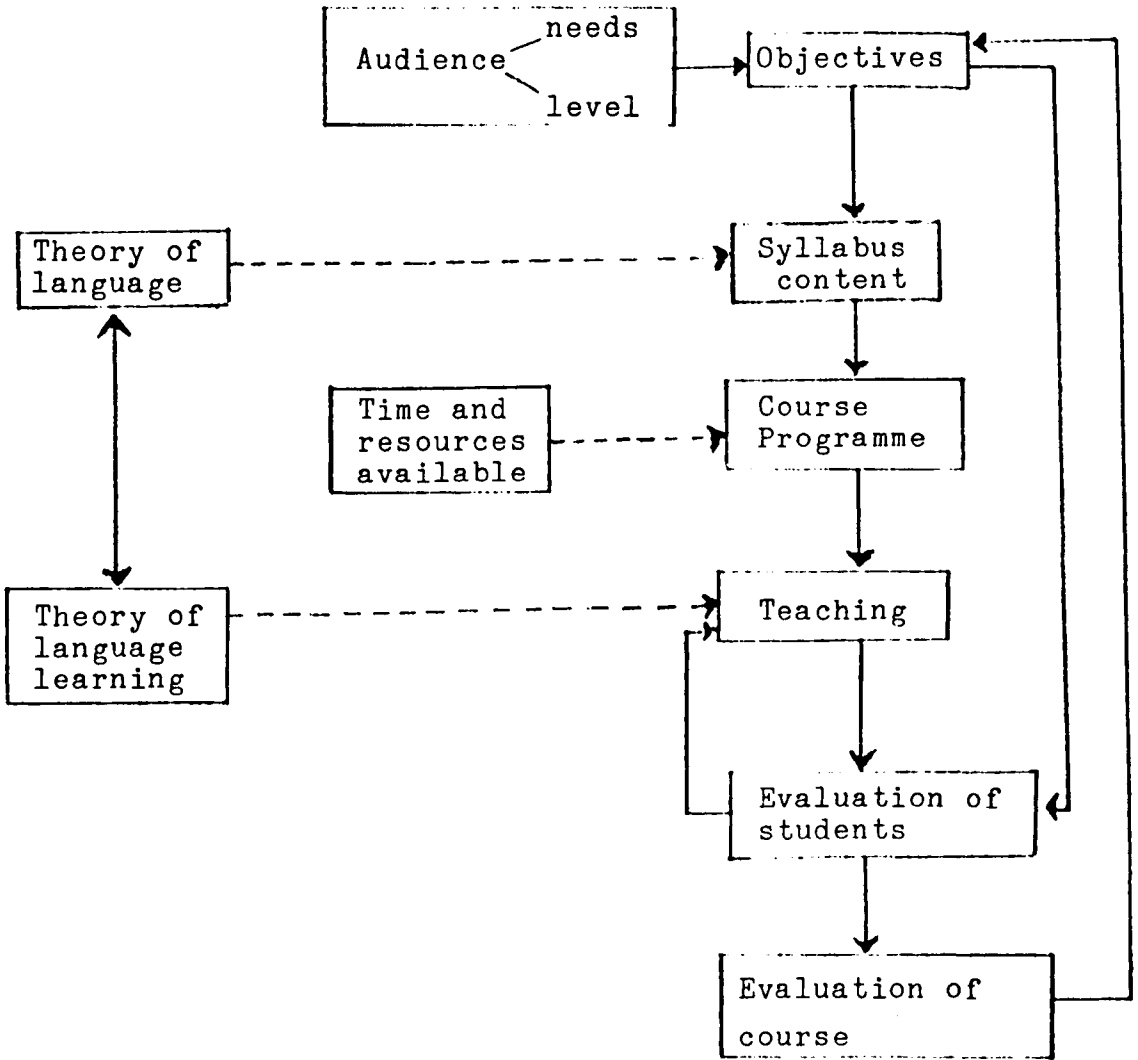
- v. The fifth problem deals with the specification of learning tasks to be used in classroom work. This, of course, depends on the teacher's organisational and imaginative abilities to monitor and manipulate the learning resources available in his institution so as to sustain the learner's motivation and develop his attainment. In effect, the teacher's organisational abilities depend in part on his pre-service and in-service programmes, if any, which constitute a crucial component of the administrative aspects of the ESP programme. In fact, those problematic areas should be approached simultaneously in designing an ESP course. Hence, the outcome on which the course planner bases his decision derives from consideration of these problems as if they were non-discrete areas as each of which is reprocessed in the light of the results arrived at in dealing with the other areas. Candlin et al (1978:191) illustrate in diagram (5) below how those variables interact in the ESP programme.

Issues and Problems

Course Design

Theoretical issues

Practical considerations



-----> shows

where issues and problems most obviously impinge on the process of course design.

Diagram 5

2.2.2.2 Variables Relative to the Learner's
Needs and Expectations

Given that the learner is a crucial element in the process of translating the course components into linguistic and pedagogic terms, satisfying the learner's requirements would help produce effective ESP programmes. Edwards (1974: 247) purports that the range of an ESP course depends on the following main factors:

- i. the time available for such a course,
- ii. the level of understanding or use of the specialistic English required,
- iii. what particular language skills are necessary,
- iv. what vocabulary is essential, either because of the frequency of its use or because of its contribution to the basic understanding of the subject,
- v. what the specific linguistic problems of the groups are, and
- vi. aspects of the cultural and educational background which may have any bearing on these.

Consequently, information concerning the participant's identity, language, age, sex, nationality and place of residence are of a great significance in identifying the needs to which the learner would use the target language (Munby, 1978:34).

However, in an ESP course whereby specific communicative behaviour is to be achieved,

the learner's goals depend, in effect, on particular variables which would stem out of categories of communicative needs. Those variables would impinge on particular communicative behaviours whereby contextual appropriateness is to be taken account of in dealing with the target syllabus as shown in diagram (6) below which is formulated by Munby (1978:29).

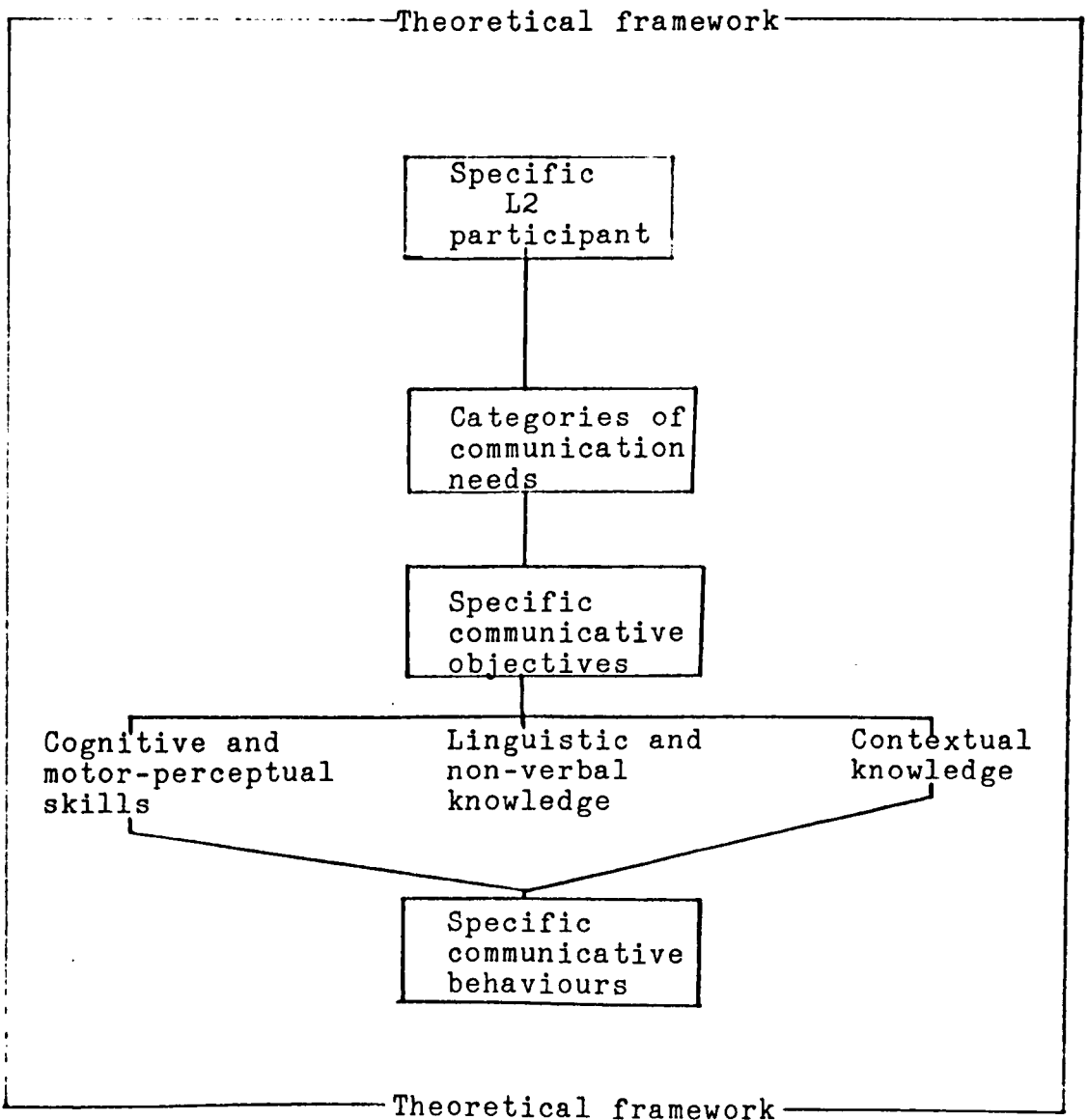


Diagram 6

Therefore, appropriate syllabus specification in an ESP course would be well presented only after a prior account is taken for learners' needs. Hence, in order to design effective ESP programmes, we have to specify what the learners need to use English for. Thus, we have to be aware of the amount of knowledge and mastery of the foreign language required by the learner to perform a specified task. We have also to bear in mind that the place of residence affects markedly the language skills required. Therefore, an ESP course for non-native students studying medicine in an English-speaking community would have some different objectives as compared to those studying in a non-English one. This would indicate, for example, that the content of an ESP course designed to meet the requirements of a group of foreign students who intend to join a course to further their studies in, say, the U.K. should necessarily contain a 'social English' component which would include some cultural and social orientation. This implies that learners' needs and expectations constitute a paramount guide which streamlines the ESP course objectives.

When needs are clear, learning aims can be defined in terms of these specific purposes to which the language will be put. ... The result is that almost immediately, teaching can be seen to be effective in that the learner begins to demonstrate communicative ability in the required area (Mackay and Mountford, 1978:3).

In fact, there are other variables which would influence foreign language learning in addition to students' needs (see Gardner and Lambert, 1972). Those variables include the learners' attitudes towards the culture of the target language, the interaction between learners and teachers, stress from examination, parents and peer group relations. Other things, such as the number of students in a class, the type of method and material used, and even intelligence and foreign language learning aptitude would also be taken into consideration. Therefore a more valid approach and material design should depend on researches which start with the foreign language teaching/learning process itself and deal with all its specific variables as well as making use of information possible from other fields pertinent to the teaching/learning process in the respective country where the ESP course is to be adopted(cf. Rosler, 1981:57).

Finally, administrative variables should be first pointed out as they are, and steps should be taken to modify them and other variables in the educational fraternity in order to meet demands which stem out of the learners' needs and expectations. This simply implies that, though logistic and pedagogical variables such as the type and number of ESP teachers available, financial considerations, learners' attitudes towards the target language are important factors that impinge on the ESP programme organisation,

they should not, by any means, be allowed to hamper the process of getting at an ESP course which would help establish the communicative needs of the learner. Otherwise, our ESP course would be turned into dogma.

2.3 The taxonomy of ESP Courses

Broadly defined ESP courses are sub-divided into a number of different types. Thus, we find ESP courses such as EST (English for Science and Technology), EAP (English for Academic Purposes), EOP (English for occupational Purposes), etc. Actually, some of the above sub-divisions could be classified under one term.

Given that the objectives and syllabuses of the ESP courses are recently determined by the functional and pragmatic requirements of the learner or group of learners, more specific ESP courses have emerged today. Examples of these courses are English for students of engineering, medicine, physics, English for businessmen, secretaries, air traffic controllers, etc. However, each of these sub-divisions could also be divided into more sub-divisions.

Stevens (1977:92) divides ESP courses into two types, namely 'EST Courses' and 'Other Courses' as shown in diagram (7) below which is formulated by Stevens (Ibid). Within each of these broad sub-divisions of ESP we have either occupational EST and educational EST or occupational others or educational others.

A Taxonomy of ESP Courses

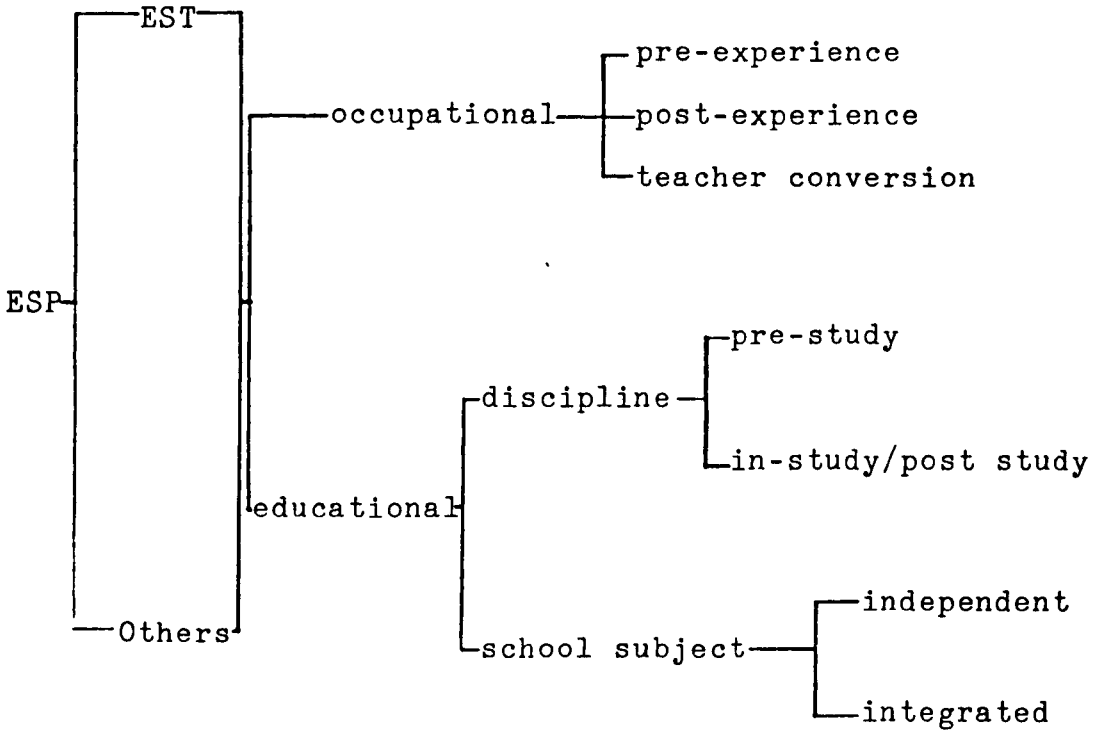


Diagram 7

Therefore, the above diagram indicates that EST forms a major part of ESP (see also Mackay and Mountford, 1978:6).

And within ESP, EST refers to English for science and technology, a particular subset of ESP, which entails special learning features (and special teaching requirements, too) (Strevens, 1980:32).

It is to be noted that although EST programmes are arranged to meet the demands of a homogenous grouping of EST students, it must be emphasised that

there will be a wide variety of specialist disciplines within this group. Therefore, nowadays it is discernible that EST courses which meet the requirements of students studying, say, Biology, Chemistry, Nursing, Medicine, Botany, etc. are much in demand.

However, I feel that Strevens's taxonomy of ESP courses as shown in diagram (7) above, is taxonomically unsound. I believe that the sub-divisions of ESP in diagram (7), namely 'EST' and 'Others' would be in a 'lower node', whereas 'Occupational' and 'Educational' would be in a 'hyper node' as EST courses and their sub-divisions would be more attached to ESP subject matter rather than to a type of profession. Accordingly, I would like to modify Strevens' diagram as shown in diagram (10) below which is, in effect, based on Strevens' diagram (9) (Strevens, 1977a) below in which there is no mention of 'EST'. Strevens' diagram (9) is actually a modification of diagram (8) which is formulated by British Council (1977) (see Robinson, 1980:7).

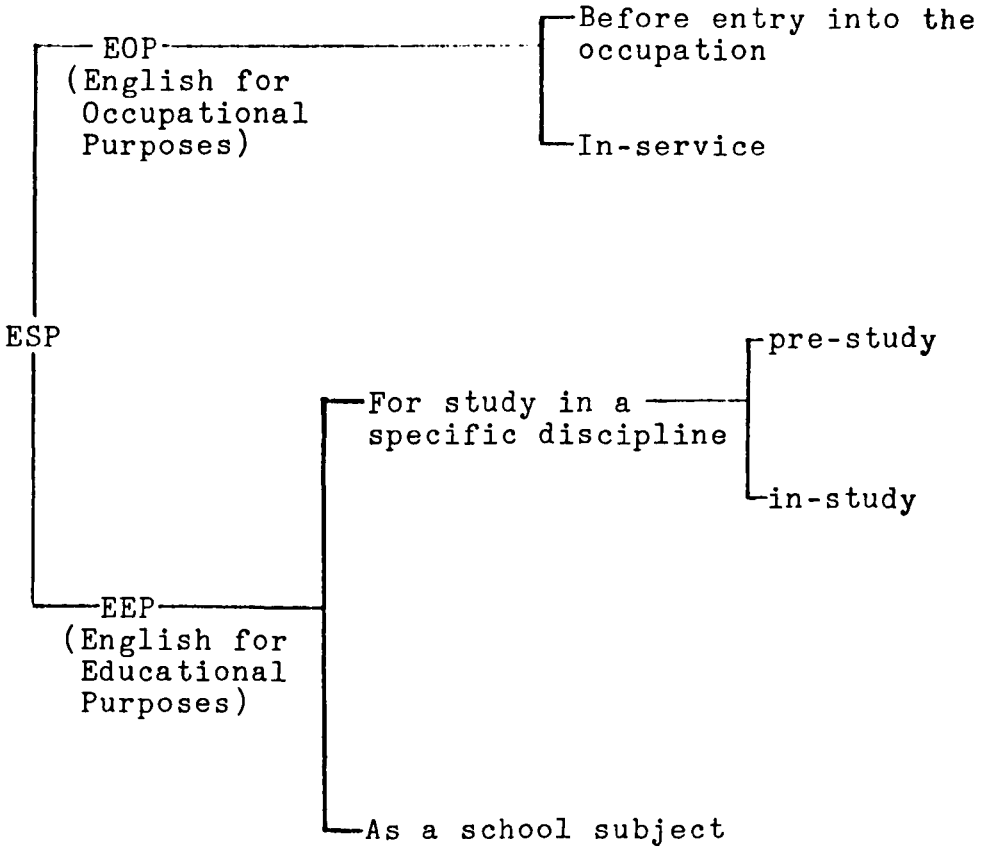


Diagram 8

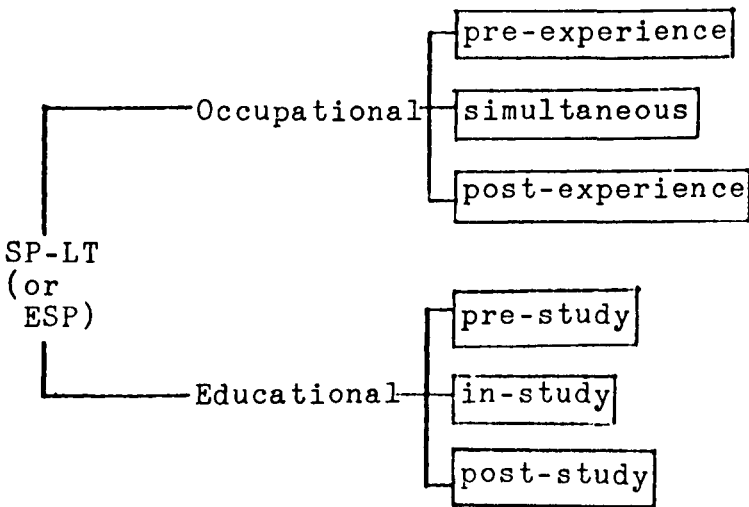


Diagram 9

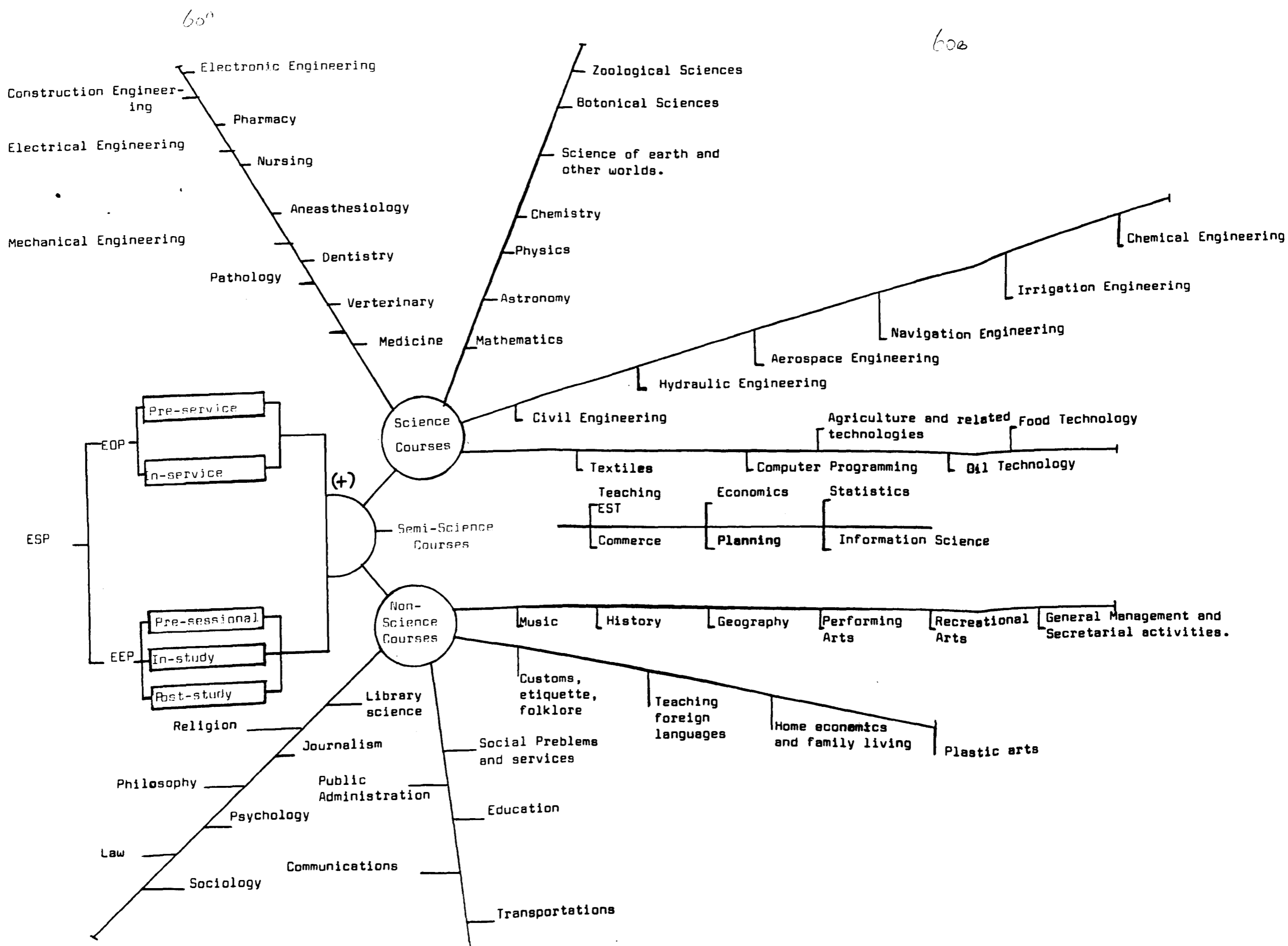


Diagram 10

(+) = see footnote 3 in this chapter

2.4 EST : A Major Sub-Division of ESP

2.4.1 Introductory Note

The fact that industrialisation and technological innovations which constitute a major aspect of national development in many countries, particularly in developing countries, has led not only to the development of new types of English teaching courses and preparation of new materials to suit the requirements of learners of EST, but also to re-examining the current TEFL courses to ensure that language teaching courses and their objectives match the demands of society of the respective country. Hence, the rapid expansion of technological education and needs in developing countries has led to the establishment of science and technical faculties which have stressed the need of EST as a tool of communication and interpretation.

Undoubtedly, English is today one of the few main languages in the world in which scientific literature circulates. Therefore, one would notice that success in academic work in science faculties, taking part in international scientific conferences and studying for postgraduate scientific degrees whether at home or abroad, are greatly related to the ability to read, write and understand reasonably scientific literature in English. Thus we find that in developing countries more rigorous research works are being carried out in science and technical institutions (Lee Kok Cheong, 1976:3). Simultaneously

there has been a closer consideration of the requirements of English courses for academic purposes (EAP) which would involve learners' needs, language materials to meet those needs and discussion of the role of mechanical aids which would contribute much to the process of teaching/learning EST in developing countries. Those perspectives and others have geared the educational personnel in those countries to seek alternative and more effective approaches for teaching foreign languages, particularly English. It is worth noting that objectives may vary according to the field of speciality and the aims of the course which are germane to diverse factors within a certain country.

Each form and field of knowledge will have its own particular set of learning goals, and these may vary between educational communities within and across political boundaries (Jones and Roe, 1976:21).

However, recently in most developing countries where English is taught as a foreign language it is studied primarily in order to have access to basic written texts for the undergraduate level. Presumably in countries where the native language is used as a medium of instruction in science institutions, such as Syria and in some science faculties in Iraq, the target language is employed, most probably, to have access to recent development dealt with in scientific journal articles and volumes written in that language, whether for academic or professional needs.

2.4.2 The Nature of Scientific English

To begin with, there are many features in common between EST and "General English", as both employ the same features of phonology, grammar (probably with different distributions, as in the case of 'passive constructions' (cf., for example, Svartvik, 1966 and Crystal, 1969), and most of the lexis (but see p.64/65). Still, there are some features which are mostly confined to science texts such as mathematical symbols, graphs, grids and charts. In general, the concepts which are used in science are almost always confined to science texts (Strevens, 1980:123).

However, Strevens (1973:228) purports that EST deals with three interrelated fields of study, namely 'Science', 'Technology' and 'Technical Services'. In connection with these fields he states (Ibid):

Science is concerned with understanding, describing and explaining the nature of the universe (including, of course, Man).

Technology is concerned with how to design, operate and control machines, devices and instruments.

Technical Services are concerned with how to construct and maintain the devices invented by technology according to the principles established in science.

According to Harré (1960) (as cited by Jones, 1974:1), the main objective of science is to give adequate descriptions and analyses of systems⁽⁴⁾ which usually involve three kinds of operations: specifying the structure of the system and the sub-systems, specifying the properties of the system or its state at a given point in time, particularly in physical science, and specifying the pertinent changes that the state of the system undergoes, together with the antecedent states and external influences that affect the state of the system.

Hence, scientific English incorporates both general and scientific concepts. It uses international scientific terminology which is mostly based on Greek and Latin roots, the terms of certain branches of science and other coinages. It also deals with the symbols and visual conventions of mathematics. Technological English makes a heavy use of special vocabulary. More reference to the concrete and the practical is shown in technological English than in scientific English in which the abstract and the philosophical has more dominance than the practical. Theoretical English relates more to the practical processes than to abstractions. There is also a good deal of semi-scientific English used alongside scientific English (Richard, 1976:x).

However, Strevens (1977a:154) points out that there is a higher frequency of occurrence of the following language features in scientific English prose in comparison with literary English:

- i. long embedded sentences with many complex clauses,
- ii. heavy use of nominalisation and nominals in adjective positions functioning as modifiers, and
- iii. frequent uses of passivisation, particularly truncated passives and passive-like statives (see also Widdowson, 1974:289).

Presumably, the above notions about scientific English as well as other assumptions relative to the textual analysis of scientific language would give us a clue to get at more salient implications to be employed in tackling the problem of teaching EST.

Broadly speaking, Stevens (1980:149) gives the following parameters as special points to be considered in trying to solve the problem of learning science through a foreign language:

- i. the nature of the science being taught, which determines the language content, and thus sets the limits of the language learning task,
- ii. the language situation, which largely determines the extent and type of language difficulties,
- iii. the sociolinguistic and cultural situation, which determines the extent of unfamiliarity of scientific concepts to the learner and their manifestation in his language,
- iv. the stage of national educational development, which determines both how easy or difficult it may be for a particular scheme of science educa-

tion to be put into effect and also what general standards of ability in English may be expected in the teaching profession,

- v. the pedagogical situation, which, on the one hand, determines the shape of the language problems in the science classroom and, on the other, determines the nature of the professional resources in English teaching (and teacher training) that may be called upon for assistance.

2.4.3 Approaches to EST Materials Production

Syllabus contents in EST courses pertinent to communicative language teaching depend basically on two important sources. These sources are the views the course designer holds about the nature of language and the way it works, as well as the learner's communicative needs and expectations which would shape up the EST course to be studied (cf. Candlin et al, 1978:192).

To begin with, different language teaching approaches, namely Translation Methods (Traditional), structural approaches (linguistic methods) and functional/notional and communicative approaches, stress, so far, three different aspects of language in their treatment of EST. Some put heavy emphasis on scientific lexicon, others emphasised the structural aspect of the language, particularly language structures at the sentence level, whereas more recent language teaching theories lay heavy emphasis on the conceptual and textual scientific materials (Richards, 1976:xii).

Students may be motivated towards a particular

learning, when that activity satisfies a certain need in them (Brustall, 1974:71). This would imply that, if students did not see the relevance of the English course to their aspirations, they might not be motivated to take that course seriously. Dudley-Evans et al (1976:105) purports that a suitable course for science students would have to meet the following requirements:

- i. it would have to commence at a sufficiently low level to accommodate most of the students,
- ii. it would have to maintain the interest of the students by
 - a) showing itself relevant to their major subject,
 - b) the types of language-learning activities involved, and
- iii. it would have to provide the students with the language and strategies they need to read scientific texts at the undergraduate level in their major subjects.

In fact, although Dudley-Evans et al (Ibid) talk about Iranian science students at the university of Azarabadegan, in Iran at the time the research was conducted, all the points raised would apply to most science students in the Arab world at present. But, of course, there are some exceptions in science faculties as we will see in the coming pages.

However, I am going to divide EST materials into two types, those based on notions prevailing in the pre-communicative era of language teaching and those pertinent to the communicative idea of language teaching.

2.4.3.1 Pre-Communicative EST Materials

EST materials preceded the communicative era of language teaching had the following features as cited by Ewer and Latorre (1967:289):

- i. analysis of the English actually used in the 'target' conditions;
- ii. selection of the most frequently-occurring or useful items in relation to the teaching time available;
- iii. systematic exercising and drilling of this material in contexts reflecting the special interests of the learners;
- iv. the provision of supplementary readings from the corresponding literature.

In fact, the linguistic scene before the adoption of the communicative idea of language teaching has witnessed different schools of linguistics, each of which has its own view of language analysis. Traditional schools concentrate on lexical characteristics, and structural schools (Bloomfieldian and Transformational) emphasised apposition and sentence structures. Presumably, the reasons behind that

circumlocution in EST teaching are relative to the fact that language teachers and syllabus designers always wait for the linguist to provide them with the framework to adopt in language teaching. If they probed their own classroom problems and then called upon the linguist to contribute to the results they would arrive at, the scene of language teaching, particularly EFL, would be more rigorous than what we envisage today.

However, the usual stereotype analysis of scientific texts before the advent of structuralism concentrate on materials which embody mainly lexical and grammatical characteristics of scientific literature such as nominals, passive verbs, tenses, relative clauses, and appositions (Lee Kong Cheong, 1976:10). It seems that, though the problem of lexis in 'scientific English' requires special attention in EST, it is not, in effect, as crucial as the problem of using effectively scientific concepts and rhetorical functions in a communicative context by the non-native speaker, as failure to understand those functions and their relations in a text would lead the foreign learner to miss the implicit information displayed in the scientific text, and that in turn would lead to misunderstanding of the total meaning to be conveyed in it (Selinker et al, 1976:36) (see also Allen and Widdowson, 1978:59).

Structuralism, on the other hand, provides EST material writers with a syntactic method of analysing scientific prose which concentrates on a set of simple manageable structural patterns so as to reduce the syntax and simplify its learning through pattern practice techniques and overdrilling exercises. The main problem which structural analysis has faced, however, is that human languages, and English is no exception, can supply us with different ways of saying the same thing. Consider the following two examples which are cited by Candlin et al (1978: 216-7):

Example A: Asking for repetition.

Excuse me, I seem to have missed the point,
mind going over A again?

I am sorry, I'm not clear about A. Would you mind
explaining it again?

Excuse me, Would you mind repeating that, please?

I'm sorry, Could you please repeat that?

Sorry, Would you please run through that
point again?

——— What did you say Chomsky's definition
is?

Eh? Why do you think Fillmore is wrong?
What did you say about focus?

What did you say?

Chomsky says what?

Suppose what? etc.....

Example B: Asking academic questions.

Question $\square + \Delta - \square = 0$?

- (a) Is that formula true in all cases (1a, 2a, 3a, c, f)
- (b) I may be dense, but I don't see that, I'm afraid (1f, 2b, 3a, d, e).
- (c) You're not asking us to believe that this formula actually works, are you? (1a, 2c, 3a, c, f).
- (d) I'm sorry if I appear confused, but does this formula have practical applications, or is it merely of theoretical interest?
- (e) This formula is applicable to what? (1e, 2e, 3b, d, f).
- (f) What would be the result of applying this formula to Z situation? (ab, 2c, 3a, c, f).
- (g) I find this formula fascinating from a theoretical point of view, but don't see any obvious applications of it (1f, 2c, 3a, c, e).
- (h) If this is true we make the following conclusion? (1a, 2d, 3a, c, f).

However, studies based on Transformational Generative Grammar have provided EST teachers with rigorous materials on the sentence level (see, for example, Huddleston et al, 1971, and Gopnik, 1972) as they succeeded in accounting for structural problems, which Bloomfieldian structuralism could not

tackle, by means of what Chomsky (1965) calls "deep structure" in sentences, particularly in ambiguous sentences as shown in (A) below, the relationship between active sentences and their corresponding passives as shown in (B), and the difference between "action passives" and "statal passives" as shown in (C) below, for which Bloomfieldian structuralism failed to provide sound explanation. (see Tawfiq, 1976, Chapter 2)

A. Ambiguous sentences.

1. Flying planes are dangerous (ambiguous sentence, Chomsky, 1972).

This sentence could mean either:

- i. Planes which are flying are dangerous (as shown in diagram (11) below), or
- ii. To fly planes is dangerous (as shown in diagram 12 below).

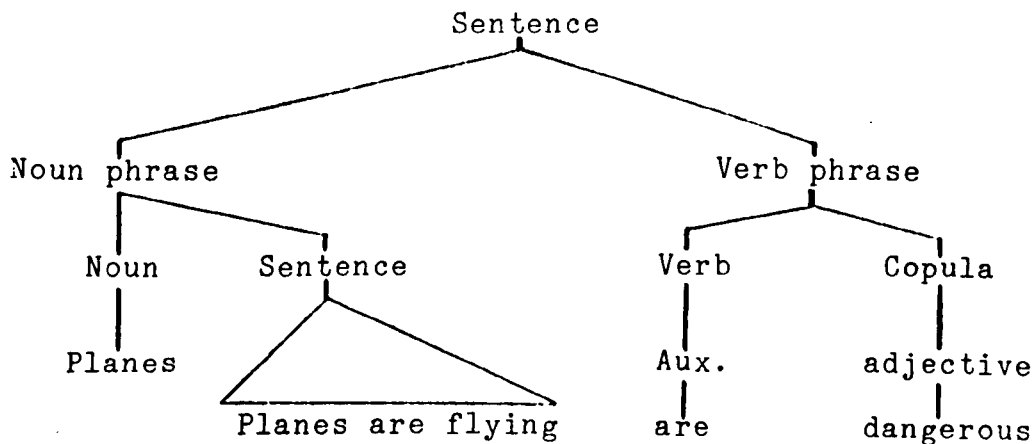


Diagram 11

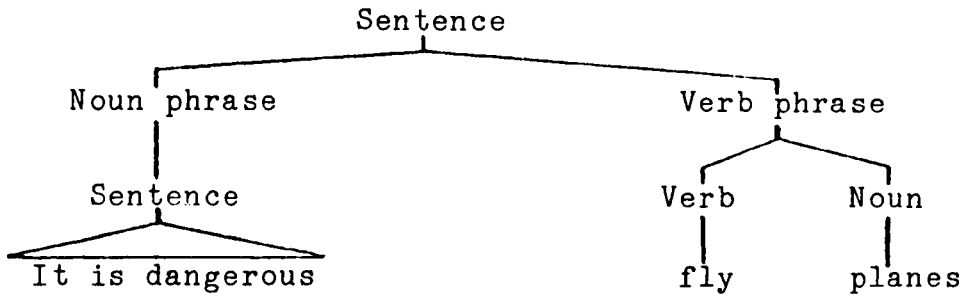


Diagram 12

(B) Passivisation (5)

1. The police arrested the thief (Active form as shown in diagram 13 below).
2. The thief was arrested by the police (Passive form as shown in diagram 14 below).

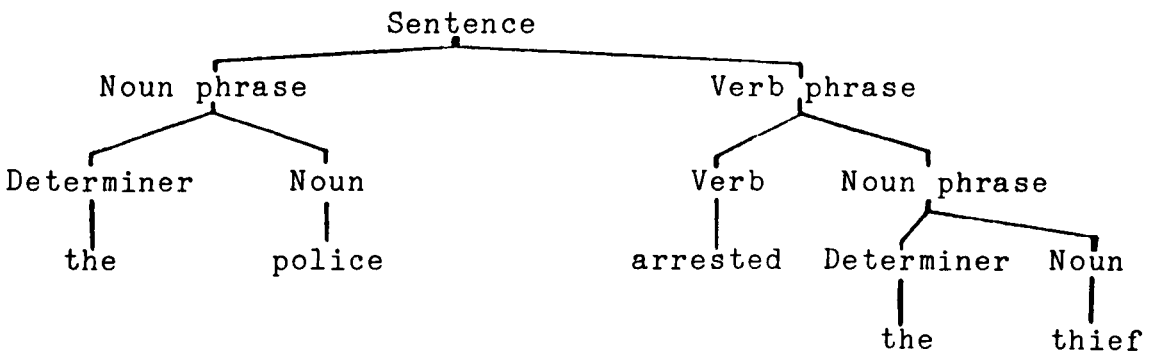


Diagram 13

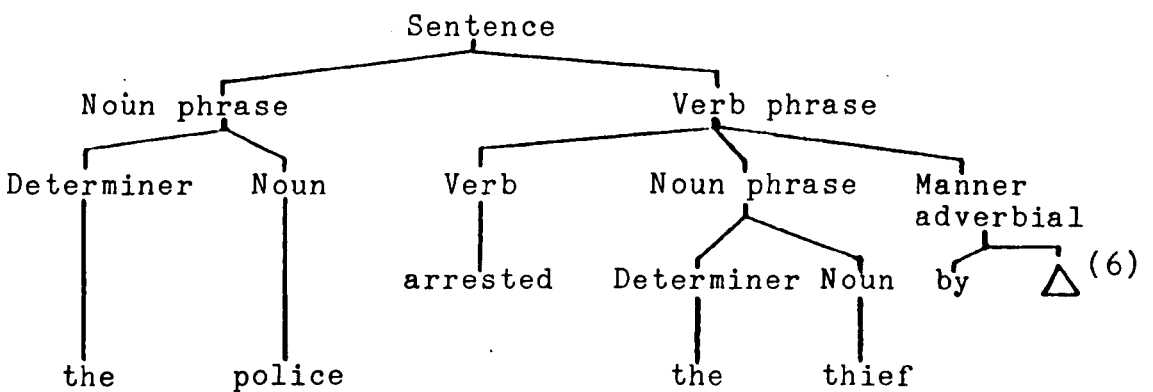


Diagram 14

(C) The difference between "Action passive" and "Statal passive".

1. The window was broken (Action passive as shown in diagram 15 below).
2. The window was broken (Statal passive as shown in diagram 16 below).

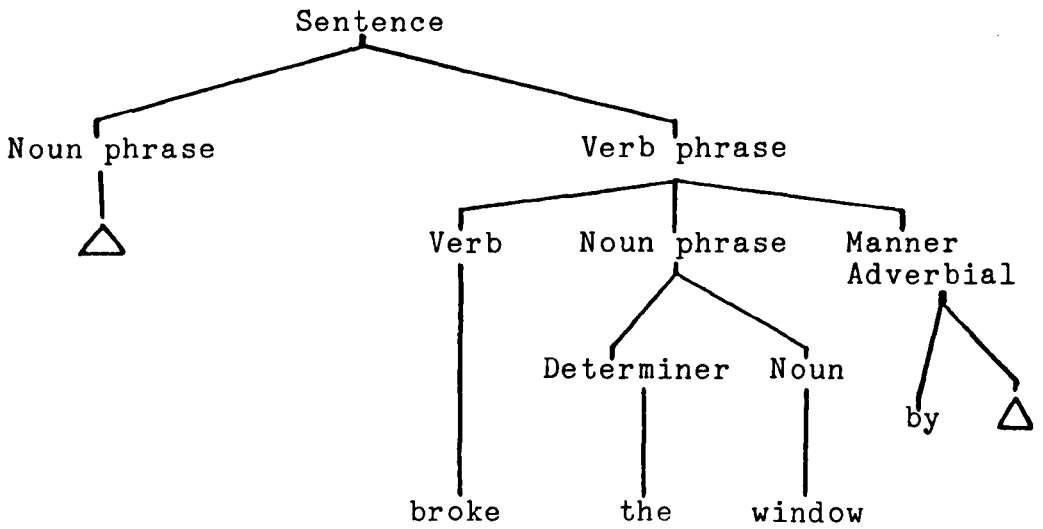


Diagram 15

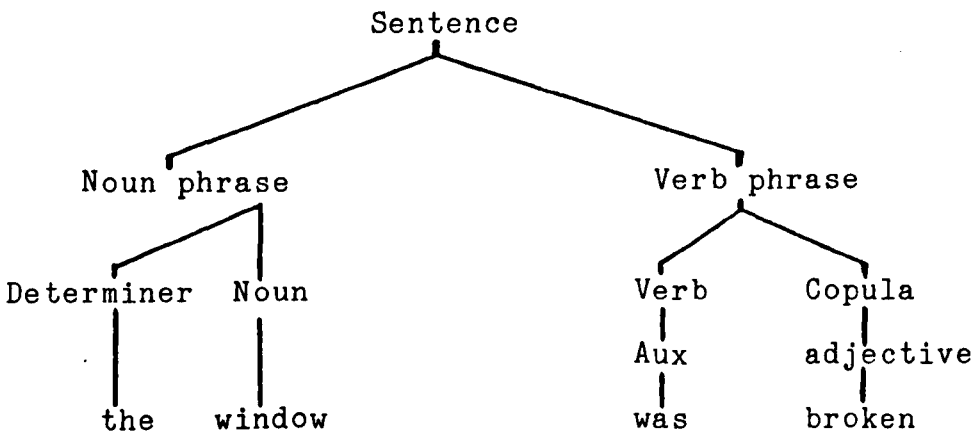


Diagram 16

Actually, Chomsky's grammatical competence is mainly structural in nature, as emphasis in his theory falls on rules relative to sentences which are the results of base rules and transformational rules as well as on rules of syntactic and semantic potentialities which he calls "context-sensitive sub-categorisation rules" (see Chomsky, 1965: 95, 117, 120). Therefore substitution of materials based on transformational generative theory for Bloomfieldian structuralism only restored the status of the audio-lingual approach of language teaching as the best approach since both theories refer to a base in the linguistic theory.

However, despite the pedagogic significance which EST materials based on Transformational Generative Grammar theory would provide, they, as structuralism does, emphasise the teaching of usage rather than use, and thus deprive the non-native EST learner of the opportunity of establishing communicative attainment in the target language. Hence, once again, grammar remains the centre of EST studies. In connection with the dominance of grammatical syllabuses, Wilkins (1976:1) notes that "as the learning of a language is mostly commonly identified with acquiring mastery of its grammatical system; it is not surprising that most syllabuses have grammatical or "structural" organisations". He adds (Ibid) that syllabuses need to take account of more than mastery of linguistic aspects.

Actually, the interest in use rather than usage in TEFL constitutes the main distinguisher between older EST approaches and the more recent trend in EST language teaching.

It is to be noted that until very recently EST materials were organised on structural basis with emphasis on scientific and technical vocabulary. Experience and case studies (see, for example, Candlin et al, 1974, Bates, 1978, Swales, 1978) have shown that structural EST materials failed in coping with most EST students' needs and aspirations. In connection with this Trumper (1977:5) states:

A traditional structural course was only superficially related to the students' needs. Collections of texts.... provided very little practice in the use of English at an appropriate level of scientific and linguistic difficulty.

However, the afore-mentioned argument should not imply that EST materials based on such discrete item approaches to teaching scientific English are totally invalid. They, in effect, could help EST students establish some knowledge of grammatical features used in scientific sentences, and may also emphasise the scientific lexicon which students usually encounter in their scientific textbooks. This indicates that some structural techniques can be made use of in teaching EST. For example, instead of

using drilling exercises as a means of teaching, it can be used as a checking device whereby students' mastery of the learning item would be evaluated and traced. For this restricted purpose rapid question and answer drill would be of use in formal settings instead of a formal choral drilling (Dudley-Evans et al, 1976:177) which is, undoubtedly, boring for adult learners.

Research works (see, for example, Selinker et al, 1976, Mackay and Mountford, 1978), however, have shown that students of science and technology require more than the understanding of lexicon and isolated structures to effectively understand the meaning of scientific texts, in that those students are in need of an understanding of the communicative functioning of the scientific discourse of the target language which, in effect, embodies lexical items, language use and usage.

2.4.3.2 Current Perspectives in ESP

2.4.3.2.1 Introductory Note

To begin with, materials occupy a central part in an EST programme, particularly in communicative teaching methodology (British Council, 1977:119) whereby students would depend more on their own abilities in their interaction with their specialised information rather than on the teacher's contribution, the teacher in most cases acting as a consultant, particularly in a group work technique.

Actually, EST has illuminated the field of ELT, particularly TEFL, because of the inter-relationship between EST and other existing language teaching developments, namely communicative language teaching and discourse analysis. In fact, there is an urgent need for specially designed EST curricula to support the transfer of technology, and for an effective procedure for designing such curricula. Presumably, traces of a rigorous communicative approach to teaching EST seem to deal with the following notions.

2.4.3.2.2 Learner-Centred Materials

Current ESP courses lay much emphasis on learner-centred instruction and individualisation. This trend is clearly noticed in the educational fraternity of the current language teaching/learning processes. Development of a theoretical framework of needs analysis could well be discerned in current EST work. Approaches leading to categorisation of linguistic and communicative behaviours are notably expounded specifically in Munby's work (Munby, 1978), pragmatic analyses relative to the observation of specific types of learners and their actual behaviour (see, for example, Candlin et al, 1974; Sinclair and Coulthard, 1975) and current systematic approaches germane to the notion of selecting particular language learners with specified communicative needs (see, for example, van Ek, 1980) are still in progress. Corollary to this, potentialities of learner-centred techniques such as group work and individualisation activities are in proliferation and

rapid progress.

Therefore, the element of needs or purpose of the learner has been dominating EST course design since the advent of communicative methodology. EST courses vary, in effect, from those courses which require limited study skills, as in the case of "English for students of Botany in Iraqi science faculties" to those which require more English communicative skills on the part of the learner as in "English for Iraqi postgraduate medical students who further their studies in the United Kingdom" (cf. Pritchard and Chamberlain, 1974:48). Thus, the principle of needs-analysis has reinforced the 'what' and 'when' of teaching (Stevens, 1980:118). Therefore we notice that EST materials production is closely related to the notion of learners' needs.

ESP ... should focus on the learner and the purpose for which he requires the target language, and the whole language programme follows from that (Munby, 1978:2).

Given that the notion of learner-centred approaches and specified communicative needs have geared researchers to the study of rhetorical functions in both spoken and written modes, EST courses have moved towards sets of language categories pertinent to communicative abilities; and that in turn has led to more rigorous research to be carried out in the field of EST discourse analysis and textual analysis.

Presumably, EST materials would deal with the particular branch of science which the students are majoring (see diagram 10, p.60), as students would be more interested in language materials relative to their field of specialisation. Presumably, loose definitions and explanations as well as semi-technical terms at the beginning stage would help motivate EST students to grasp scientific language. Therefore, graded materials would better start from less technical English to more technical ones. This procedure would, in effect, match students' progress in their field of specialisation, whereby learning more scientific concepts, technical terms, scientific charts, mathematical expressions and laboratory experience would be achieved (Wilardjo, 1976:135). Another distinguished point about EST materials production is that EST syllabuses would be organised around the functions which are linked to the student's field of study.

It is to be noted that EST materials to be prepared would take into consideration the linguistic and communicative development of the learner, his cognitive development as well as his knowledge in his field of specialisation. It is, of course, evident that part of the course designer's diagnosis of a learner's needs falls on the development of the educational system in which the learner has had his initial training, and in which the course is to be adopted; therefore, it would be erroneous to

select materials for the EST course from scientific books or journals originally written for specialised native speakers of the target language. Such materials would, however, pose considerable problems of interpretation, as well as educational problems for foreign learners of the target language, due to diverse factors germane to educational, political, sometimes religious, and even more importantly, to factors pertinent to the knowledge of the world. Therefore, EST materials would be selected and modified in such a way as to be appropriate for classroom use in a country which would have different educational grounds from those of the country of the target language. As Mountford (1976:149) points out, simplification or modification of original scientific materials to match the needs of foreign learners should cater for both recreation and adaptation features of the scientific text.

2.4.3.2.3 The Approach to Textual Analysis

Given that language teaching materials which have been mainly concerned with sentence analysis would not help much in meeting the demands of specialised learners whose aim of the target language is, in effect, to produce stretches of language that fit together and where cohesion and coherence play an important part in understanding, speaking, reading and writing understandable texts relative to their specialised fields, we see now that teachers whose aim is to

ensure that their students are able to deal with stretches of language above the sentence level, particularly at the text level, would train them to analyse and compose stretches of text relative to their field of specialisation rather than deal with isolated, uncohesive sentences.

Although some foreign learners may be able to read and write grammatically correct sentences, they may be unable to understand and produce spoken or written coherent stretches of discourse in the target language (Johnson, 1977:16). The reason behind this problem is that those foreign learners are not taught to use the target language as features of coherent texts which would ultimately provide them with an analytic competence to deal adequately with the target language.

Given that the primary aim of teaching scientific text is to help students to be able to deal with various types of scientific texts and effective communication interactions, such a teaching would gradually involve explanations and analysis of scientific texts and various properties of language use in more precise terms, particularly at advanced levels of learning. This would lead EST students, eventually, to be able to deal with the practical application of scientific language and communication projects depending on insights they would draw from their analysis and criticism of scientific textual properties (van Dijk, 1981:19).

Actually, one of the most important points which we would gain in dealing with discourse analysis and textual analysis is that discourse assumptions and textual analyses would raise debate, discussion and controversy in the language teaching fraternity whereby fresh perspectives in ELT would be created. (Nyyssönen, 1976:241).

However, the type and amount of scientific material to be taught should be appropriate enough to pave the way to students of science and technology to establish and develop the knowledge of science and technology, and the language skills they require to communicate with their colleagues about their fields of study in spoken and/or written modes.

Broadly speaking, understanding scientific textual analysis entails on the part of the learner grasping quantification of various kinds, mastery of scientific vocabulary which is mostly of Latin and Greek affixes as they operate in English, and the use of communicative acts special to science and technology as well as some grammatical properties, particularly those germane to scientific texts. It is to be noted that scientific texts reflect illocutionary acts of a particular kind, such as defining, classifying, describing, explaining, reporting, asserting, hypothesising, predicting, etc. (see Mountford, 1976:146). Those acts are, in effect, of crucial importance in this field of study; therefore, adequate attention would be given to them when dealing with EST materials.

Undoubtedly, the understanding of the meaning of implicit presuppositional rhetorical functions in EST texts would be of prime significance for the science student in order to gain access to the total meaning displayed in those texts. Selinker et al (1976:38), however, have found that non-native learners have "an inability to comprehend the total meaning in pieces of EST discourse even when they understand all of the words in each sentence and/or all of the sentences in the particular piece of discourse" (Ibid).

As far as grammatical properties are concerned, students of science should also be aware of certain conceptual relationships in scientific texts which include 'logico-grammatical items' (Stevens, 1980:125) with other grammatical features in English such as subordination, relativisation, co-ordination, etc. which are crucial for understanding the rhetoric and the argument of scientific discourse. These logico-grammatical items are notional in nature. They are listed by Stevens (Ibid :131) as follows.

- i. Linking and logical sequence of ideas; and also, besides, furthermore, moreover, simultaneously, thus, too, apart from, as well as, in addition to.
- ii. Paraphrase and apposition: like, similarly, as if, in the same way, in like manner.

- iii. Causality: accordingly, as, because, consequently, hence, once (something has occurred), since, therefore, until, whenever; as long as, as a result of, by means of, due to, for the purpose of, in order to, it follows that, on account of, owing to, necessary and sufficient condition.
- iv. Opposition or contrast: alternatively, although, but, if, however, though, in spite of, irrespective of, on the other hand, necessary but not sufficient condition.
- v. Restriction: except, impossible, occasionally, only, trivial, uncertain, unless, if, if and only if, only when.
- vi. Hypothesis: conclude, confirm, consider, deduce, imagine, infer, invalidate, refute, suppose, theoretically, validate, in principle, it follows, it would seem that... .
- vii. Enquiry: how big? how long? how many? ... etc.; what? when? which? who? why? how? with what purpose? to what end? to what extent?

However, it seems to me that
Strevens' logico-grammatical features are confined to
the 'paragraph level', so to speak, since his logico-
grammatical features would be more appropriately
used within one paragraph, i.e. to link particulars
of one idea. I would think that the following logico-
grammatical features, to borrow Strevens' term, would
be employed to give scientific material coherence on

the textual level: Broadly speaking, Given, Conversely, In fact, Actually, Undoubtedly, Simply, However, Consequently, Hence, To begin with, In effect, Finally, Presumably, To sum up, etc.

It is worthy of note that there is a close relationship between the use of grammatical articles such as 'the', 'an', 'a', 'some', etc. and the knowledge of the subject matter in understanding and composing scientific discourse. Selinker et al (1976:54) seem to be on the safe side in purporting that it is difficult for the non-native learner to produce correct grammatical articles in his scientific writing without having a thorough understanding of the scientific concepts relative to his special field of study.

EST material would also deal with scientific discourse germane to laboratory procedures. Therefore, the material would incorporate instructions for laboratory experiments, descriptions of apparatus being used as well as explanations of activities (Jones, 1978:56). Directions about how to produce scientific reports of the experiments carried out would also be well-explained. Thus in dealing with the skill of 'report writing' EST students would develop the following sub-skills (Ibid:57):

- i. developing their deductive skills from observations made and data tabulation,

- ii. understanding written scientific instruction and translating them into action in the laboratory; and
- iii. mastering the skills of data processing and scientific report organising.

It is to be noted here that scientific report writing would require to deal with the following sections.

- i. The abstract.
- ii. The introduction whereby background theory is expounded.
- iii. Description and classification of equipment and instruments used in the experiment.
- iv. Discussion of results.
- v. Conclusions and suggestions.

Actually, short reports would be brief and deal with the purpose of the experiment, the results aimed at which are, sometimes, accompanied by tabular or graphic forms and some discussion of the results, and a short summary or conclusion.

As far as vocabulary is concerned, scientific materials selected for initial stages of the scientific course should not contain a surfeit of difficult scientific vocabulary which would lead the class to get bored with the course from the first lecture. On the other hand, the material has to be attractive to students by being clearly related to their academic needs and by containing interesting information and encouraging the use of learning/

teaching activities.

Scientific discourse would not be totally new to non-English students of science and technology, as they would already be familiar with scientific language and the non-verbal conventions which are of universal type such as diagrams, charts, formulae, etc. Those universal sets of symbolic devices convey scientific concepts and processes relevant to a certain field of study (Widdowson, 1979:27). Consider the following example cited by Widdowson (Ibid:26) in which he exemplifies a type of chemical discourse in which acts such as instructions, descriptions and reports can be derived from a formulaic representation, as shown in diagram 17 below.

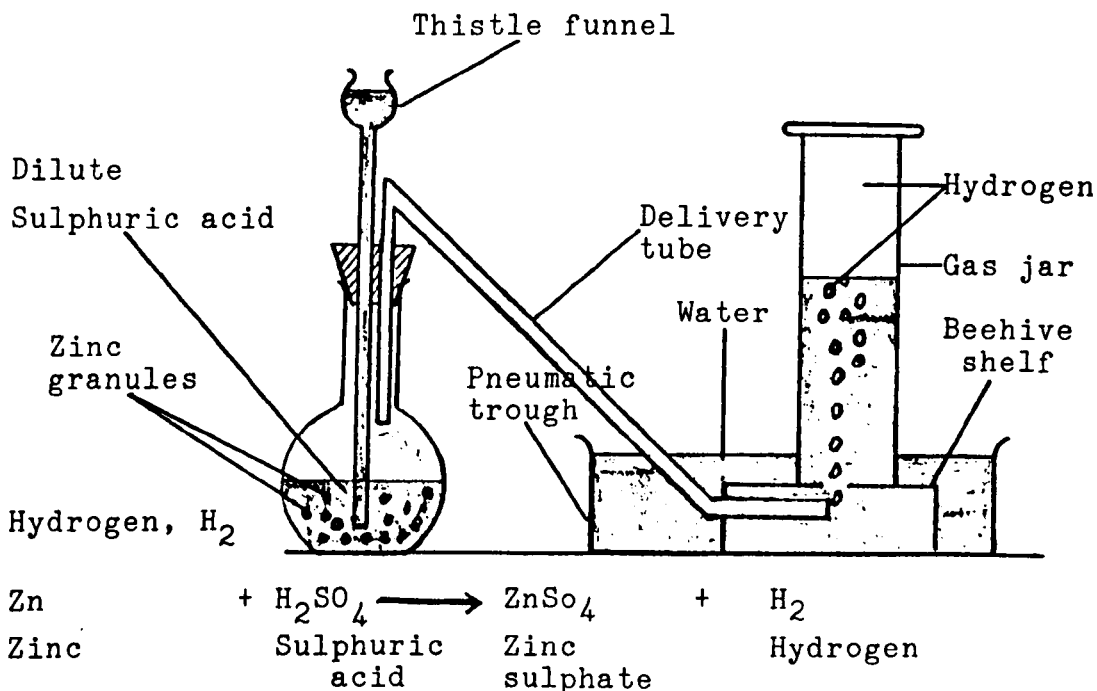


Diagram 17

Instructions

Place zinc granules in a flask fitted with a thistle funnel and a delivery tube. Place the other end of the delivery tube in a pneumatic trough. Fill the trough with water ... etc.

Description

Dilute sulphuric acid is added to zinc granules in a flask fitted with a thistle funnel and delivery tube. A chemical reaction takes place and hydrogen is given off... etc.

Report

Dilute sulphuric acid was added to zinc granules in a flask which had been fitted with a thistle funnel and a delivery tube ... etc.

In fact, the diagrams, comments and examples written on the board together with aspects of paralinguistic behaviours, namely use of gestures, eye contact, gaze direction and change of posture have an important part in students' acquisition of the total meaning of the text (cf. Abercrombie, 1973).

Hence, since scientific English ensures the appearance of written vocabulary which is often accompanied by illustrative diagrams, therefore scientific discourse will explain sensibly the I2 vocabulary with the aid of such charts and diagrams (Waters and Hutchinson, 1981:65)

Finally, in order for the EST material to help students understand effectively

scientific texts, it should be capable of establishing in the students the following linguistic and communicative attainments:

- a) The learner has to grasp the information content of the sentence as well as the semantics of the words and phrases of which it is composed; and
- b) the learner should also be able to grasp the contextual meaning of the text of which the sentences are composed, as sentences have a contextual value to what precedes and what follows. Understanding the formal and functional meaning of the text would help learners focus on certain aspects of the text for inferring relationship between speaker and listener/reader and writer. This would also help learners understand the meaning beyond the context provided, i.e. understand, for instance, the speaker/writer's attitude towards certain information embodied in the text.

In short, an EST material the aim of which is to help non-native learners deal effectively with scientific texts in the target language, has to acquaint them not only with semantic values of the words and sentences in a discourse as isolated items, but it should also help them to be aware of the discursial features of the text, i.e. they should know well what goes with what and when.

2.4.3.2.4 Authentic Materials

Nowadays much emphasis has been placed in EST on the use of authentic texts. Presumably, authentic materials which are full of themes would be extremely useful in the area of EST where students have a common purpose and nearly a common motivation. In fact, classroom analysis of authentic texts relative to the special area of interest to the learners would be a feasible approach to ESP courses, particularly in dealing with scientific materials where analysing, stating and concluding are important processes to be mastered in dealing with scientific topics.

... it is authenticity, appropriacy, and globalness all combined that constitute the communicative value of a language, without which the language becomes just a hollow carcass (Xiaoju, 1984:6).

Therefore, scientific texts relative to real-life situations would help much in understanding and producing the required discourse relative to their academic studies as such life situation discourse models would rehearse the steps which learners would carry out in real life. Consider the following 'real life' medical material cited by Parkinson (1976: 172) intended for overseas doctors training in the United Kingdom.

Woman, Aged 35.

Doctor: What's happened?

Patient: I've just been in a road accident.

Doctor: Were you the driver or the passenger?

Patient: The driver.

Doctor: Were you thrown out of the car or did you get the steering wheel in your chest?

Patient: I wasn't thrown out but I got the steering wheel in my chest and I hit my head on the windscreen.

Doctor: Were you knocked out (made unconscious)?

Patient: I don't remember anything after the accident.

Doctor: Have you got headache or pain anywhere other than your chest?

Patient: My head aches; that's all.

Doctor: We'll send you for some X-rays and stitch (suture) any wounds later.

After examining X-rays:

Doctor: You've fractured your skull. We'll have to admit you for observation. Do you want the clerk at the desk to notify any of your family?

Patient: Oh yes. Will you ring my husband at work? This is his number.

However, in selecting authentic texts for our EST students, whether for teaching or testing, we would be able to judge whether those texts would be appropriate by evaluating them in terms of the following questions (Morrow, 1977:15):

1. Would my students deal with language acts intended to do the same thing? (e.g. to apologise, advise, give instructions, describe, report, etc.)
2. Would my students have to deal with language skills like this, i.e. written or spoken?

Authentic materials should also deal with social English when considering students who intend to further their academic studies in an English-speaking milieu or who are already there. These students will need social English for communication on the campus and outside it, when they go shopping and in various other situations, such as the bus, the bank, the restaurant. Therefore, they would need to use speech acts such as inquiring, requesting, complaining, reproaching, apologising, asking the way, meeting the tutor for the first time, and so on and so forth.

2.4.3.2.5 Translation

Presumably, the spread of science and technology in many developing countries has made it possible for learners from those countries to be acquainted with technical terms in the target language. (Smithies, 1976:124). In an experiment conducted by Smithies (Ibid) on medical students in Thailand where Thai is the medium of instruction, he found out that 82 per cent of the lexis, both medical and general, were known when students read the prepared texts.

This would imply that the spread of scientific knowledge would help in a way the decoding process needed in translation.

Presumably in EFL countries which have a tradition of learning scientific literature as Western Europe does, it would be possible that learning skills, particularly comprehension processes, could be transferred from L1 into L2. Accordingly, students of science and technology who are already initiated into scientific knowledge, concepts and procedures in their native language and through non-verbal symbolisation (Widdowson, 1979:27) would be able to make use of their L1 to be aware how scientific information is carried out through the linguistic system of the target language. Thus, translation would be one way to gear students' attention towards exploitation of the knowledge of science they have in their language to be associated with, the way the same knowledge is communicated in the target language.

Therefore, by using translation as one teaching technique of many, in teaching scientific materials we can gradually withdraw the help of the L1 and increase the use of English. Then students can rely completely on using English when they notice that their awareness of how English is used to communicate effectively in scientific discourse has developed (Ibid: 33).

Therefore, sometimes the use of translation into the native language would be of crucial significance, particularly with the use of terminology. In scientific discourse, specifically in medical science, translation would give precise meanings which medical studies require to comprehend a text (Dudley-Evans et al, 1976:180).

It is to be noted that translation as a 'teaching method' would hamper the establishment of adequate strategies in the L2 learner as it interferes with the achievement of fluency in the target language by depending continually on the vernacular in the decoding and encoding of information. But translation as a process is a highly useful pedagogic technique whereby "information transfer" (Mackay and Mountford, 1978a:13) would be of crucial significance in scientific English, as it is assumed (Ibid) that the processes and procedures of science are the same in all languages.

However, we have to bear in mind that translating scientific materials, particularly articles, as a large-scale policy is not feasible, since many texts would be out of date before the translation could be available (Higgins, 1966:56); and that in turn would deprive FL science students of the opportunity of keeping abreast of the constant changes in scientific terminology and the rapid advance in scientific knowledge.

2.4.3.2.6 Study Skills

To begin with, concentration on study skills is a fundamental point in EST courses. These skills are, in effect, used in most cases for EAP purposes. However, the place of residence for the participant in an EST course has also a vital impact in shaping the particular skill or skills required in such a course.

Therefore, the linguistic and communicative skills required from an overseas student learning EAP in the United Kingdom would include the ability to understand lectures in English, take notes from a lecture or a book, and the ability to participate in a seminar. Study skills would include the ability to use English references and how to make the best of the library in his institution (Kerr, 1977:12).

The language needs of the students would be met by selecting EST materials from the field relative to their study. The materials are selected according to the language skills the learners require to develop. Written texts are usually employed for developing reading skills and oral materials for developing aural skills (Mackay and Mountford, 1978a: 130). Hitherto, one might usefully distinguish that the best way for teaching study skills would be to use the specific subject of the study itself as a medium for developing those skills in the EST students. Therefore, taking the area of specific academic language emphasising the structure, lexis, cohesive

devices, logico-grammatical properties, discourse and textual features and other areas of language which could be confined to the specialised subject areas of the group would help the EST teacher to teach the directly relevant skills required by his students.

Generally speaking, non-native science students studying in the EFL milieu require skills and sub-skills relative to reading, note-taking and organising information collected in reading quickly for information and in note-making. They are also in need of skills relative to report and letter writing, skimming for the gist of content, using a dictionary and library facilities such as indexes and bibliographies adequately (Beard, 1972: 185). They would also, at a later stage, be in need of establishing seminar strategies such as giving short talks, stating a point of view and requesting clarification.

One of the benefits of teaching study skills to science students would be to help students learn the target language for ordering and sequencing their thoughts, which is important in delivering a short talk in a seminar. Price (1977: 27) suggests five stages which students are usually in need of in presenting a seminar. They are as follows:

- i. general introduction,
- ii. statement of intention,
- iii. information in detail,
- iv. conclusion, and
- v. invitation to discuss.

In teaching the above stages to her postgraduate students at Newcastle Price (Ibid) has put forth the following examples:

- i. "I am going to talk to you about...."
"My talk is concerned with"
- ii. "I intend to divide this talk into four parts.
Firstly, I shall mention Then"
- iii. "Now, to return to the first point"
"I shall now elaborate on the first part"
- iv. "So, as you can see, this is basically what my
research is about"
"I hope this explains a little about my research.."
- v. "I shall be happy to answer any questions"
"If you would like to know more"

In fact, educated adult learners tend to rely on book learning where the printed word plays a crucial role in gaining more information (Smithies, 1976:121). One might usefully distinguish that all EST students are adults who have developed their own strategies for learning. Therefore, the teacher should also try to make use of some of these strategies if they could serve the aim of the course.

Indeed, individualisation and group work teaching would encourage students to develop their previous strategies for learning, and use them as a bridge for moving up to develop new ones initiated by the course. Actually, one of the great advantages of group work activities is that EST students would reveal their weaknesses in functional language skills and that would lead the language teacher to develop language techniques, materials and exercises whereby language teaching/learning processes, which are appropriate for students' needs, would be attained.

2.4.4 The EST Teacher

The teacher is an important variable in the teaching/learning process, particularly in foreign/second language teaching situations where students, in most cases, find him the main model and source of knowledge in the target language they are learning.

As far as EST teaching is concerned, a serious problem in many parts of the world lies in the provision of an adequate supply of teachers. In most cases, the people teaching and administering ESP, particularly EST, programmes have themselves received no special training in ESP (cf., for example, Robinson, 1980:75, Al-Hamash, 1978a:6).

Presumably, one of the formidable problems of EST is that students of EST may be familiar with the subject matter of the materials to be taught,

whereas their teacher may not. Perhaps some EST teachers who take part in EST syllabus design or engage in materials writing would be well-trained and of a high standard of qualification to carry out such a task. Yet, unfortunately, those teachers are far beyond the demand. Therefore, at present, despite the rapid derive in ESP training courses in general, particularly in the United Kingdom, ESP, especially EST, is still disastrously bad in most developing countries because most of those who teach ESP are teachers of 'general English' basically with literature-based background.

Not all those who are good teachers of 'general English' will be good teachers of ESP. The teaching force for ESP needs to be capable not only of classroom presentation but also of full participation in syllabus design, materials production, test construction, fruitful collaboration with subject specialists, and methodological innovation (Strevens, 1980:119).

It seems that one of the issues which are of noticeable importance and worry the educational personnel about the educational scene in general is the confusion in which the teacher of ESP is put at present. This confusion stems out of the fact that new ideas of communicative teaching

is to be thrust into rigid syllabuses and limited class hours, coupled with work in overcrowded classrooms. Such a scene implies a demand for radical changes. In fact, attaining effective courses for students and fruitful training for teachers depends crucially on the way in which principles and classroom activities interact (Brumfit, 1979:2).

In order to be effective EST teachers, trainee teachers of English should be trained to be effective EFL teachers as well. Brumfit (Ibid:4-8) suggests a useful integrated syllabus for basic trainee teachers' courses of TEFL which I feel would be of great benefit as part of EST trainee teachers' courses in EFL situations such as the one in Iraq (see appendix 1).

However, in designing an EST teacher training programme, the course designer should not, by any means, ignore the fact that that programme would be closely linked with the specific national and local factors, as the educational process is an integrated system whereby national and local dimensions would be considered crucial variables. Therefore, the role of the teacher as part of the educational system would be identified from the start and that role should be evaluated from the point of view of the philosophy of education of the country concerned.

Actually, a trainee teacher's course should be set in such a way as to look on teachers as

part of an organised society, and that may have a social responsibility to help in building up students' personalities as human beings in order to enable them to cope effectively with their life experience when they leave school. Thus, a teacher would have a wider perspective than mere technical procedures of classroom activity. Accordingly, any course for trainee teachers should have had the perspective of helping trainees to be leaders, teachers and educators (Strevens, 1980:4). Indeed, the teacher should be aware that his teaching strategy would either improve or impede his students' learning process.

Generally speaking, a course for training teachers must avoid the limitation of being over-specific and should train trainees to the range of abilities needed by a teacher in a national educational system such as the one carried out in Iraq. A trainee should be prepared through the course to be able to deal appropriately with an argument, say, for or against a particular political, economic, social and moral view of the world. In fact, the teacher in the educational system is sometimes seen as having an intermediary position between the learner and other educational establishments. He would be looked upon as a meeting point of demands and expectations of very many different variables that impinge on the teaching/learning process. Hence, the course should draw the teacher's attention to the role that society demands from him as a leader and a guardian for the new generation. He should be aware that there are

social influences which have crucial impacts on him as he constitutes a member of many groups in the society he is part of. The relationship between the teacher and the other variables mentioned above could be seen as shown in diagram 18 below (after Morrison and Melintyre, 1969:6) (See Brumfit, 1980:53).

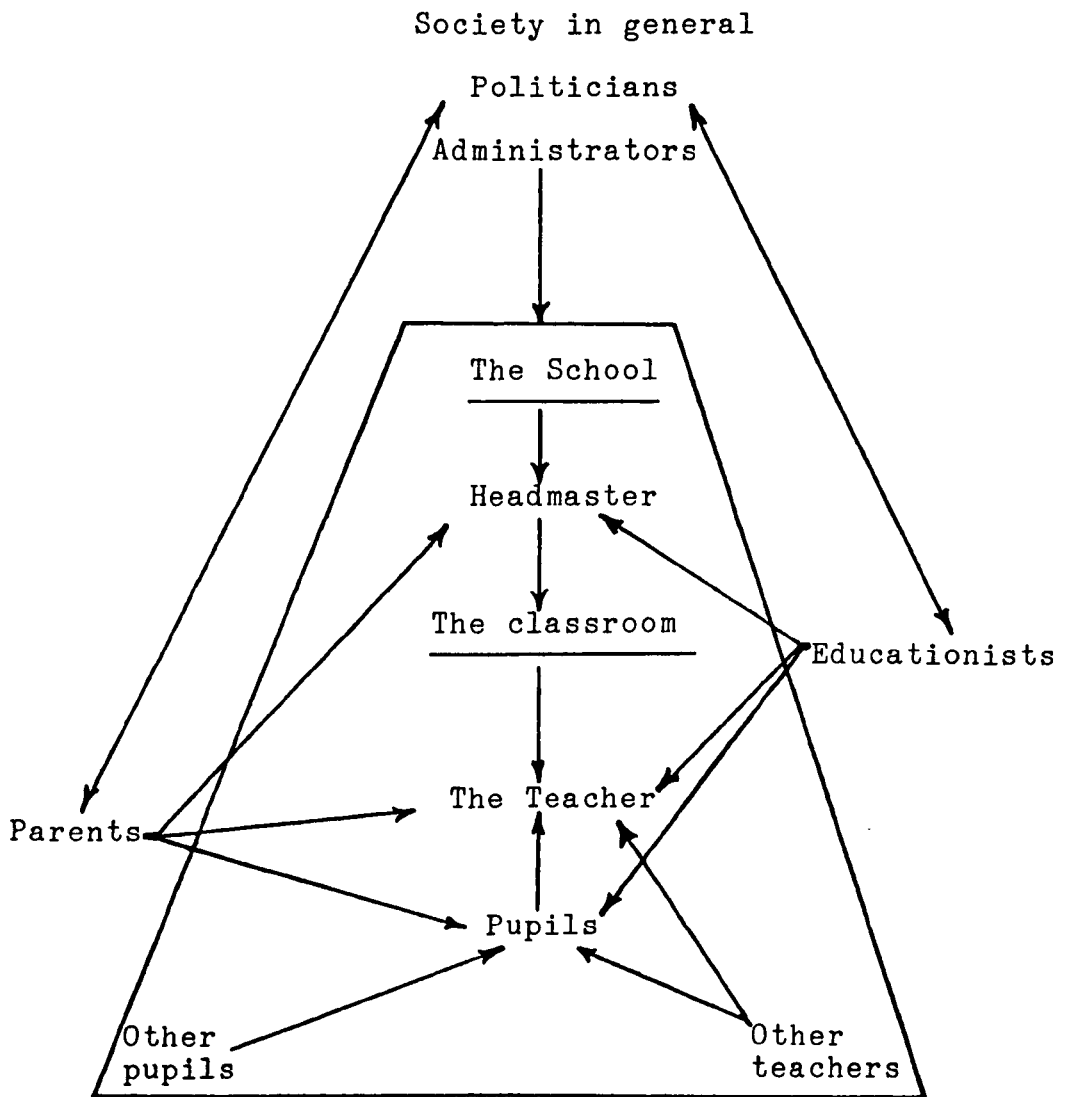


Diagram 18

An effective course should enable the trainee teacher of English to finish as close as possible to the goal of the course, i.e. the training

should be as realistic as possible in relation to the materials and teaching aids available at the educational institution and the position of the target language in the school or university curriculum. On the other hand, the course should not allot most of its time to teaching trainees a great deal of theory at the expense of practical classroom needs. At the end of the training course, the trainee teacher should be clear enough to relate his theoretical position to the classroom requirements in his own social environment.

As far as the EST trainee teacher programme is concerned, the following variables should be developed:

- i. training in EFL;
- ii. training in ESP in general, and EST in particular;
and
- iii. possessing a good knowledge in the field of specialisation of his students.

It is also crucial to note that the EST trainee teacher's course would provide trainees with guidelines for EST material production, so that they would be able to produce their own EST materials or supplement existing materials to meet their students' needs, particularly in cases where there is no suitable EST material available in their institutions (Kennedy, 1979:45). They would also be able to deal with EST tests relative to the students' field of specialisation. This requirement in turn demands an ability and enthusiasm on the part of the EST teacher to approach and understand the specialised texts.

Presumably, students who have had a science background would be more suitable for training as EST teachers as they would be more motivated to teach EST than candidates with a literary background, since they are familiar with the content area and would be more confident to carry on their task. There is a consensus of opinion that teachers who are not familiar with the subject content of their students would find it difficult or even worrying to teach EST because of the gulf in terms of subject knowledge between teacher and students.

But what skills would an EST trainee teacher's course include? Of course, an EST teacher should be considered "an EFL teacher and a half", so to speak, i.e. he should be helped to have mastery over the four skills of the target language he is teaching, as well as having the ability to deal with the subject speciality of his students. He should also be trained to deal with scientific report writing and directing scientific lectures and seminars (Kennedy, 1979:45).

Therefore, the teacher of EST would be aware through the training course that scientific English employs almost always the core of 'general English' and full range of scientific philosophical and methodological concepts, and makes extensive use of scientific terminology which is in most cases based on Greek and Latin roots. He would also be familiar with visual conventions of mathematics and terms of

particular branches of science and other coinages. He should also be trained to extract meaning from the linguistic framework of scientific prose, paying particular attention to the value of sequence signals, function words and relatives, modifiers and qualifiers and specialised lexis.

The EST teacher may also find that new teaching techniques make certain demands on his oral communicative ability which he would be unable to meet. This, in fact, forms a problem to the EST teacher which should be catered for in trainee teachers' programmes (Stevens, 1980:144).

Actually, the teacher of EST would be trained to deal with scientific materials on the text level, and scientific textual analysis would become a major component of EST trainee teachers' materials. Perceiving basic principles of cohesion (Halliday and Hasan, 1976), and gaining the ability to deal with scientific rhetoric would be an important target of the EST trainee teachers' course. This would be achieved by giving the trainee the opportunity to move away from dealing with scientific analysis on the sentence level to textual level. Both linguistic and communicative aspects of the scientific text would be analysed, but more emphasis should be placed on the language aspects which would meet the demands of the trainees.

Finally, EST teachers should continue to improve their resources, and educate themselves with up-to-date science materials germane to the field

of study of their students, as that would improve their ability to handle the EST materials they teach. Hence, the EST teacher, in addition to his skill in teaching scientific information relative to his students, should share the basic qualities of a skilled teacher which are prerequisite in all other branches of foreign language teaching and learning.

2.5 The Communicative Approach Within the Framework of ESP

The communicative approach within the domain of ESP theory to language teaching is intended to help students acquire the communication skills they require and respond well to open-ended and problem-solving features of their course in the target language. This approach would in effect lead students to think for themselves and improvise through communicative techniques such as group work, role-play and simulation, etc.

In fact, the interest in use rather than usage in teaching target languages constitutes the main distinguisher between the older ESP approaches and the more recent trend in ESP language teaching, particularly in EST.

The development of interest over the past few years in EST has coincided with an increasing interest in the communicative properties of language use. These developments derive ultimately from recognition that a model of language as a formal system is not sufficient to account for how language users use language to communicate (Mackay and Mountford, 1978:15).

To sum up, the communicative approach to language teaching within the framework of ESP has advocated mastery of use rather than usage, discursal and textual level analyses and the communicative value of lexical items.

2.5.1 The Principles of the Approach to be Adopted

The advent of sociolinguistics as an important factor in developing the theory of language and the tendency towards establishing communicative performance in the learner have called for a corresponding and reasonable criticism of the linguistic theory which underlies language teaching, particularly TEFL. Thus the communicative approach has emerged.

In the communicative approach language is discerned as a means of communication and self-expression whereby meaning and the rules of language use play a central part in the process of human interaction.

Let us now consider the principles upon which the communicative approach is based and see how we could make use of these principles and the techniques adopted in this approach to match the tenets adopted in ESP teaching, especially EST. These principles are as follows (O'Neil and Snow, 1977:vii, as cited by Al Hamash, 1979:8-9).

- i. Language is essentially a means of communication. Thus, any approach that does not directly contribute to this should be rejected. The teacher

facing his pupils does not contribute to this. Therefore, alternative methods should be sought.

- ii. Language is an individual process. Pupils, therefore, should be enabled to express their individual needs rather than just be members of one group.
- iii. Language is a social process, i.e. it is a means of communicating with others in social contexts. Thus, the course should provide adequate occasions on which such social interaction takes place.
- iv. The use of language is something that people enjoy. ELT materials should, therefore, exploit this and should present situations where pupils can enjoy the language.

Hence, the main principle of the communicative approach is to establish in the learner the attainment to use the target language meaningfully as early as possible. In effect, this approach has the following characteristics which distinguish it from other approaches relative to the pre-communicative era (Rodgers, 1978:252).

- i. More emphasis on message meaning; less on formal structures.
- ii. More emphasis on communicating; less on correctness.
- iii. More emphasis on problem solving, intuiting, hunching, context interpreting strategies; less on modelling, mimicry and memory.
- iv. More emphasis on creating context as well as

utterance in the new language; less on using set content and situation.

- v. More emphasis on student-student interaction; less on teacher-student interaction.
- vi. More emphasis on extra-linguistic devices, pedagogical (manipulatives, games, enactments, etc.) as well as on paralinguistic (gesture, tone, expression); less on linguistic content per se.
- vii. More attention to positive first-language transfer; less on first-language interference.

Therefore, it seems that the main difference between the approach adopted by the pre-communicative language teaching methodology and that which is adopted by the communicative methodology to language teaching, particularly TEFL, could be shown as in diagrams 19 and 20 below respectively, which are formulated by Brumfit (1980:121).

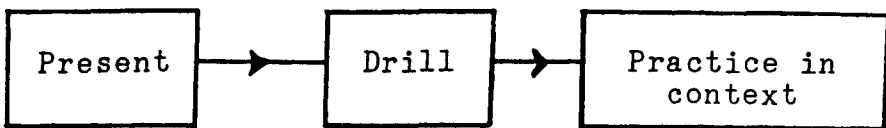


Diagram 19

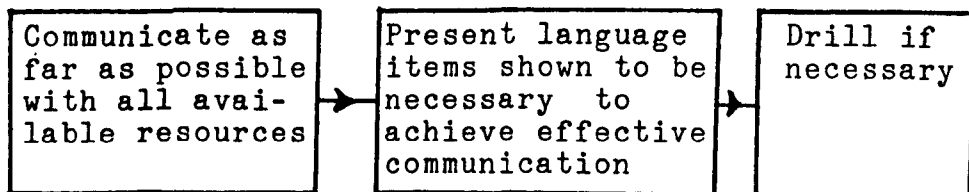


Diagram 20

It is important to note at this stage that Widdowson himself (1978:162) has stressed that one should not be too positive in one's recommendations for the validity of the communicative approach, as what proves to be theoretically valid may "turn out to be mistaken in the light of actual teaching experience and in the light of further inquiry into the communicative functioning of language".

Experimental studies on adult students (see Canale and Swain, 1980:13) have shown that emphasis on a grammatical syllabus would lead to good results in grammatical performance but emphasis on a communicative syllabus would lead to good results in communicative performance. But they have pointed out that neither would emphasis on a grammatical syllabus lead to adequate communicative competence, nor would emphasis on a communicative syllabus lead to appropriate grammatical performance.

Undoubtedly, students vary in their learning abilities, their background and natural abilities; therefore, it would be of paramount significance to make use of practical and clearly-stated principles adopted in other methods or approaches of TEFL for the sake of minimising predicted shortcomings in new tenets. However, consider the following learning/teaching differences among students (Rodgers, 1978: 253):

- i. Students learn through different media (textbooks, films, programmed texts, games, physical activities, etc.

- ii. Students learn through different styles of content/process organisation (deductive, inductive, discovery, learning by doing, memorisational, etc.).
- iii. Students have differing abilities and preferences in modes of reporting their learning (paper and pencil tests, written reports, two-person conversations, oral reports, etc.).
- iv. Students respond differently to different forms of feedback, reinforcement and reward (teacher praise, peer recognition, competitive games, money, written certification, etc.).
- v. Students perform differently in different group arrangements (working alone, peer-tutoring, small group activities, whole class instruction, theatre presentation, etc.).

Therefore, students of ESP need to be exposed to such varied types of learning/teaching techniques that they are able to gain as much as possible from the ESP course.

Given that communicative and linguistic competences are crucial features of EAP students, particularly EST students, it would be plausible that those students gain mastery of both aspects of the target language. This would lead us to think of an integrated communicative approach whereby both aspects of language could be catered for through varied teaching/learning

techniques. Presumably, this approach would have the following tenets:

- i. The approach would cater for both communicative and linguistic attainments of the student. The syllabus should facilitate the integration of the acquisition of those aspects to the student. The student's communicative and linguistic needs should be specified with respect to communicative appropriateness and grammatical accuracy.
- ii. The techniques and syllabus of the approach should provide the EST student with authentic language materials which would respond to genuine communicative needs of the learner in realistic foreign language situations both in teaching and testing. Therefore, the objective of a communication-orientated EST programme is to provide the learners with the information, practice and experience to meet their communicative needs in their own situation. Of course, optimum use must be made of their own experience and knowledge in their own language.
- iii. This approach would also cater for the socio-linguistic needs of the EST learner. Therefore, it should integrate between knowledge of the target language, knowledge of the material to be grasped and knowledge of the culture of the people of the target language as well as the culture of the people of the learners; and

- iv. Group work techniques and the use of multi-media which involves laboratory work, cassettes, wall-charts, transparencies, flash cards, overhead projectors, television programmes, etc. should be employed as much as the needs of the students' demand.

A view of language as communication has had a profound influence on the direction of ESP over the last few years. Both the language to be taught and the purpose of teaching it has, as it were, come into focus much more closely as a consequence of the notion (Mackay and Mountford, 1978:19).

2.5.2 Classroom Organisation in the EST Communicative Course

The language teaching process is continually involved in techniques and activities in order to adapt them to serve particular language teaching purposes. Presumably, the new task of group work and group-orientated communicative materials in the EFL classroom has stimulated among teachers, educational personnel and students themselves a re-evaluation of existing philosophies of the teaching/learning process.

The group-centred activities and individualisation techniques attempt to gear the teaching/learning process to be based on students' co-operation and responsibility, which would lead to building up the student's self-esteem in his learning rather than being totally dependent on the teacher's knowledge and

initiation. Hence, most of the classroom interaction would be dependent on peer-centred and learner-centred activities. However, in group work activities, the teacher would still have the responsibility of directing activities, of speaking whenever he feels it is necessary to intervene and interrupting groups to comment on the relevance of their contribution to the topic they are discussing, and so on.

Group work would also give students the opportunity to get the pleasure and satisfaction of feeling that they can teach and support one another through group interaction and peer teaching (Salimbene, 1981:90), whereas the teacher's role will be a mixture of guiding and monitoring the groups as well as being a contributor of appropriate knowledge and abilities (Breen and Candlin, 1980:99). However, it seems it would be useful to introduce group work for short periods of class time at the beginning, then a gradual increase would lead both students and teachers to get used to this organisation of the classroom and understand each other's role in this activity.

It is to be noted that group work techniques and communication games would also pose some problems in the TEFL situation, particularly in developing countries, where the average class would range between 40 and 45 students. Probably more time and training would be required until both teachers and students, particularly teachers who are in service at present, understand the role of each other in the non-frontal language teaching/learning process.

2.5.3 Communication Games

Communication games are designed in effect to promote the communicative use of the foreign language in the classroom. These games are, in essence, originally designed for use with adult students learning a foreign language in a community which speaks that language, as in the case of Iraqi EST students learning engineering in Britain. But they can easily be adapted for use with students in the EFL situation, provided that they have already grasped the basic structural elements of the target language, i.e. when the complete beginner stage is over.

It is to be noted that emphasis in the communication games is, in effect, placed on co-operation rather than competition. The teacher's main responsibility in these games is to see that the games are being done well and students of each group are engaged in some activity; thus his role will be more consultative than directive and/or authoritative. The following are some of the communication games which would be of use for EST students.

2.5.3.1 Simulation or Role-play

A simulation game is a game of pretence whereby students would be enabled to practise language use with guidance from materials and the help of the teacher. In these games students would take different roles, for example, doctors, patients, engineers, workmen, and so on (Turnbull, 1981:380).

Actually, simulation exercises attempt to elicit interactions which are crucial for EST students. These exercises would be directed to help students reproduce real communicative situations which are relevant to their needs and expectations. It is to be pointed out that, although students are free to select the content and the form of their communicative functions, they are, in essence, guided by specific instructions and notes they are often given prior to the demonstration of the simulation exercise. The teacher can help by preparing the class for the simulation activity by presenting the register of the target language which is required for that specified kind of activity. The follow-up work, which would lead to a refined performance, is supervised by the teacher after taking some notes, unobtrusively, while the simulation exercise is taking place.

Simulation would be of use in developing reading skills whereby different exercises can be designed and practised by the learner in classroom situations. Simulation can be employed to do a note-making exercise or a skim-reading exercise, etc. Thus simulation can give EST students the opportunity of simulating in the classroom the type of language and language skills he will use in his study (Sturtridge, et al, 1977:33)

Presumably, one reason why simulation or role-play activities would be most suitable for EST students is that participants would be offered considerable choice as to what to say and how to

speak, as long as they abide by general given specifications. Choice is, in effect, an essential part of communication. Presumably, if students are free to select courses of action from a number of possible alternatives, they would be able to reproduce conditions under which communication would be carried out appropriately. Therefore practice in, for example, doctor-patient interaction, doctor-nurse interaction or doctor-doctor interaction would be of paramount significance for medical students.

Therefore, simulation is not only an activity whereby students can have fun, but it is also a vehicle in which integration of listening, reading, writing and oral skills would be achieved.

2.5.3.2 Reading Pictures

Questions in English are a source of difficulty for most foreign learners. Pictures can be used as authentic texts from which students derive questions. Although pictures are cheap and easy to handle, they do sometimes present some difficulties, particularly in large classes. Slides, with the help of overhead projectors, can provide large pictures which all the class can see (Fitzgerald, 1980:281).

In an identity game exercise, students are given different kinds of pictures and divided into pairs. Then, each one is required to guess the identity of the picture which is in the

possession of his peer through asking questions. It is to be noted that students should have a sufficient knowledge of the target language in order to participate effectively in such authentic production of language. The teacher can help by giving certain key words and phrases.

2.5.3.3 The Debate

The debate is a useful activity to get students engaged in spontaneous but controlled language production. It is, in effect, an interesting and exciting activity for the TEFL classroom, particularly with advanced students such as EST students.

In a debate students are required to prepare an argument for or against a certain topic, such as "The best way to increase production in tomato crops in a cold season", for students of Botanical Science, or "How to cure a person who suffers from asthmatic attacks" for students of medicine (cf. Leong, 1980:287). After preparing their arguments, students are grouped into two main teams to work out their argument as a group within, say, ten minutes or so and be ready for setting up the classroom debate. Students are instructed to defend their position as spontaneously and strongly as they can. All the members of the team should try to participate. The teacher functions as a moderator giving help where necessary.

It is worth pointing out that students would produce effective debates if these debate-type exercises were preceded by a discussion

on the philosophy underlying controlled debates and some insights into topics germane to these debates (Edwards, 1981:388). Therefore, the teacher should not hesitate to discuss any topic he feels would help reproduction of a debate exercise by his students before the commencement of the debate. For example, to deal with a debate related to, say, "Plaque and gum disease", for students of dentistry, it is crucial that talk about bacteria that live and breed in the mouth, the acids which might come up from the stomach due to diverse causes, the hygienic way of brushing the teeth, etc. should precede the debate. Actually, the debate would be a good exercise for developing a "seminar delivery skill" in students.

2.5.3.4 The Information Gap Activities

The information gap activities are based on the notion of doubt which would lead to genuine interaction (Johnson, 1982:150). Most of these activities, which operate mainly by withholding information from students while providing them with certain clues, would take the form of incomplete tables and diagrams which students have to complete by asking for the missing information (Morrow, 1981: 62).

The information gap activities would permit genuine information flow in the classroom, particularly when used in group work techniques. Peers would ask each other about the information which they really did not know. They would also

assess the validity of the information they possess against others'.

Finally, communicative activities would help students from the outset towards understanding the target language as actually spoken and written as communication by native speakers.

The use of other media of communication inside the classroom such as video tapes would not only mirror the variety of actual modes of communication, it would also help develop students' interpretative and expressive abilities which EFL students would be very much in need of developing.

Notes Related to Chapter Two

1. The term 'restricted code' has another, more general meaning in Bernstein's work (see, for example, Bernstein, 1971). Bernstein assigns a more positive role to the social factor in language acquisition. From researches he conducted on schoolchildren and women of different classes in Britain, he found out that the individual internalises the social structure of his class. However, the term 'restricted code' I am using here has no bearing on Bernstein's meaning of the term.
2. Report of the Commonwealth Conference on the Teaching of English as a Second Language held at Makerere College, Uganda from 1st to 13th January, 1961. Printed on behalf of the Commonwealth Education Liaison Committee by the Government printing press, Uganda.
3. This classification is based on Dewey Decimal Classification (Dewey, Melvil (1979) Dewey Decimal Classification and Relative Index. Edition 19, Volume 2 Schedules.
4. By "systems" Harré (see Jones, 1974 :1) means an extended object (an atom, a cell, the universe, man, a region, etc.).
5. However, this is the standard view of the passive construction. Contrary to Chomsky (1965) there are some linguists who do not view the passive construction as generated from the active construction (see, for example, Wasow, 1977, Nixon, 1974).

6. The dummy element " Δ " triggers the passive transformation whereby the 'deep subject' shifts to replace the dummy element in the "Manner Adverbial", and the 'deep object' shifts to replace the 'deep subject' (Chomsky, 1965).

CHAPTER THREE

Developing Communicative Reading Skills for Students of Science and Technology

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Developing Communicative Reading Skills for Students of Science and Technology

3.1 Preliminaries

Undoubtedly, developing reading skills for educational and developmental purposes is crucial in all types of societies in our present world. Presumably, reading comprehension in science and technology would help science students and science specialists make the most of the great amount of up-to-date technical and scientific knowledge which would be paramount in nation building, and in enhancing science and technology in the respective country.

Even in this audio-visual age the printed word remains the pre-eminent source of information because of the sheer volume of books and periodicals produced and the availability of the accumulated writings of past generations (Hill, 1981:270).

Recently, there has been much discussion about the process of reading: its nature, and skills required for effective reading to be achieved. It has been recently accepted (see, for example, Mountford, 1975; Goodman, 1976; Strevens, 1977; Widdowson, 1978; Mackay and Mountford, 1978; Robinson, 1980; Carrol, 1980; Johnson and Morrow, 1981; Nuttal, 1982;

Williams, 1983 and Xiaoju, 1984) that reading is not a passive process ⁽¹⁾ of absorbing the message encoded in the written mode, but actually, it is an active process of communication whereby the reader approaches the text for specific causes and with diverse assumptions in mind. The information he finds in the text and his perception of the world seemingly influence his understanding of the text and his expectations about the way the circumstances and the reasons for which the text is written. Hitherto, the reader's involvement in the text is not static but dynamic. This involvement is, in essence, of crucial significance to our analysis of the reading process, as the reader would not accept passively what is written, but he would develop, modify and even reject all or some of the ideas displayed in the text and set up new ones which he assumes to be beneficial and/or more systematic.

This implies that the writer and the reader would reflect each other's aim, i.e. the writer gives explanation and the reader tries to recover it (Nyyssönen, 1976:191). However, it seems that the main difference between the writer's procedure in approaching a text and the reader's procedure in doing the same activity is that the former proceeds in terms of a plan whereas the latter proceeds in terms of a 'hypothesis' (Ibid: 196).

Presumably, the ability to read would radically affect the intellectual and social development of the individual as it involves the ability to glean information, understand and employ other people's thoughts and experiences (cf. Pumfrey, 1977a:210). Indeed, modern technical innovations have made the development of reading skills as an indispensable activity for the individual and society career, as learning to read would enhance the ability of the reading skills for the purpose of gaining access to the required knowledge. Failure to train students to be competent readers, particularly in science and technology areas, would lead our society to be seriously and progressively hampered.

Given that the reading process is a developmental activity which grows and develops as the student matures and, probably, requires more developed reading abilities so as to cope with his various demands in life, progress in reading skills will be affected by one or all of the following parameters: "physical health, mental health, sight and hearing, intelligence, background experience, knowledge of language, desire to read, purpose for reading, interest in reading and reading skills" (Balogun, 1977:342). Therefore a keen teacher would bear in mind these factors and be on the alert to cater for the individual needs of his students.

It is worth noting that one of the serious problems in education, particularly at advanced levels, is that of reading with adequate communication of the various discourse materials, specifically that relative to scientific discourse. One reason behind that inadequacy, as Van Dijk (1981:13) put it, would be germane to traditional research in reading skills which has focused on the processes of word identification and sentential semantics, paying very little attention to discourse comprehension. Another reason behind that inadequacy would be pertinent to the assumption that foreign EST students would have to face the hurdle of science materials in the foreign language in addition to mastering the variety of reading techniques embodied in the reading process (Groebel, 1981:282).

Presumably, developing L2 reading skills and those of L1 should not always be viewed from the same angle and that reading instruction in L2 must reflect this difference. Actually, the reading processes in L1 and L2 would have overlapping boundaries, yet the natural difference in life and knowledge of the world, previous experience in reading and speaking skills in the target language, difference in the systems of the target language and the vernacular would have a great impact on the development of reading skills for a certain group of students. In essence, previous

experience and training have their crucial impact on interpretation of the world of which the interpretation and evaluation of the information in reading a text is one part. No doubt, the knowledge of the world which people possess is of crucial significance in their attempts to make sense of their experience. For example, a student has to use existing knowledge in order to give meaning to topics about a 'meter reading', or 'killing a cancer cell' or describing the 'gradual landing of a spaceship' on the surface of the moon.

Hence, a reading-skills course would take into consideration the development and assessment of the learning process of reading comprehension in the native language, but should be on the alert to pinpoint a special route to be pursued by the L2 learners in dealing with the reading process in the target language: a route which would meet foreign students' requirements and expectations.

It is simply to recognise that without techniques which are both pedagogically sound and clearly related to our aims and principles the materials we produce can have no hope of success (Johnson and Morrow, 1977:63).

Recently, awareness of the problem involved in reading skills has led language teachers and educational personnel to gear research not only to ways whereby teachers would overcome usual difficulties

encountered in reading, but also to improve the reading techniques which deal with efficient reading comprehension as well as other strategies germane to the development of study skills related to reading skills such as note-making, essay-writing, etc.

Presumably, a foreign language course for advanced students aiming at developing reading skills would not deal with only the mechanical skills of reading, but it should deal with developing the mental abilities involved in the reading process. Leading students to achieve mental constructions in reading would be developed by providing exercises which would help direct "the learner to what goes on in his mind...." (Widdowson, 1978:98), so that he would establish a mental scanning in language performance.

In fact, reading comprehension which is considered one of the "survival skills" relevant to life experience should be allotted heavy emphasis in our educational curriculum as specialisation without an adequate base in academic "survival skills" is likely to hamper the process of life-long learning (Za'rour, 1981:378). Thus, developing reading skills does not only develop students' understanding of English science texts, but it would also lead to adapting to change across different subjects in all walks of life, particularly those pertinent to academic purposes and professional purposes.

3.2 Defining Reading

According to Gray (Gray, 1937:25), teaching reading skills and the development of reading skills courses depend basically upon a clear understanding of the nature of reading and the fundamental processes involved.

I must point out, however, that there is not universal agreement on the nature of reading because of the intricate processes involved in it (Otto, 1970:224).

Traditionally, conceptions of reading were, in effect, confined to the decoding of the printed symbols by turning the print word into sound in order to get at the meaning (see, for example, McCracken and Walcutt, 1963:iv). This implies that mastery of reading skills was thought of as involving only the mastery of the mechanics of reading which could be easily learnable (McBride, 1975:82).

To the psycholinguist reading is not a mere visual process as pre-psycholinguistic studies imply: it involves a guessing activity whereby two types of information are involved: "visual information, coming from the printed page, and non-visual information, coming from the brain" (Smith, 1973:6).

It (reading) is a mental process in the sense that it is of the mind, that it is cognitive (Stauffer, 1975:6).

Sociolinguists view reading as an interactive activity whereby the reader responds meaningfully to a text by making use of his concepts,

knowledge and experiences and thus one's feelings and ideas extend, personalise and influence textual comprehension (Lapp, et al, 1982:773). Therefore reading is viewed by the sociolinguist as an active process, not a passive one.

Recently, research (see Chabot, et al - 1984:148) has shown that reading involves several interrelated subprocesses in which reading comprehension involves word recognition processes as well as semantic and syntactic information related to discourse component comprehension. Carnine et al (1984:188) have found out that "students were better able to determine the meaning of unfamiliar words when contextual clues were provided". This implies that reading is a complex activity covering " a combination of perceptual, linguistic and cognitive abilities" (Brumfit,1980:3). It is a constructive thinking process which "involves application, analysis, evaluation and imagination" (Pumfrey, 1977:2). Actually, it is difficult to separate between reading and analysing what one reads as "they occur at virtually the same time Reading probably is not possible without analysing" (Taylor, 1984:391).

Presumably, conceptualising the reading process in this way makes paramount the cognitive and communicative aspects of both reading itself and reading instruction. Reading pedagogy which is implied by such a conceptualisation would include helping students to establish purposes for reading, facilitating reasoning, promoting analysis, evaluation and

encouraging students to reflect upon and refine the ideas they have encountered in the text.

Presumably, in order to develop reading skills and reading strategies, reading research would be directed towards the mental processes embodied in the intricate workings of the human mind when the various types of reading skills are in process, as there would lie the key whereby so many locked doors leading to the mental process carried out in reading comprehension would be opened, but we should approach that with scepticism and a critical attitude as "the insights that have been achieved into behaviour and mental function are limited" (Chomsky, 1970:3).

However, Brumfit (Brumfit, 1980:4) views reading as consisting of three broad processes as shown in diagram 21 on page 133.

It seems it would be difficult to separate mechanical processes from intellectual ones as Brumfit (Ibid) did in diagram 21 below. I believe that even in those seemingly most mechanical skills as in the case of reading aloud, there are certain intellectual processes, otherwise the reader would mix up what he reads. It would be unfair to assume that there are no skills in the reader's response to studies of a literary nature such as responses to style, irony, humour and the writer's philosophy as Brumfit claims in his taxonomy below. In effect, the language of literature has its own special set of rules and contingencies and language devices which require certain skills of the reader to be approached as a literary piece of language.

Reading processes

The mechanical skills

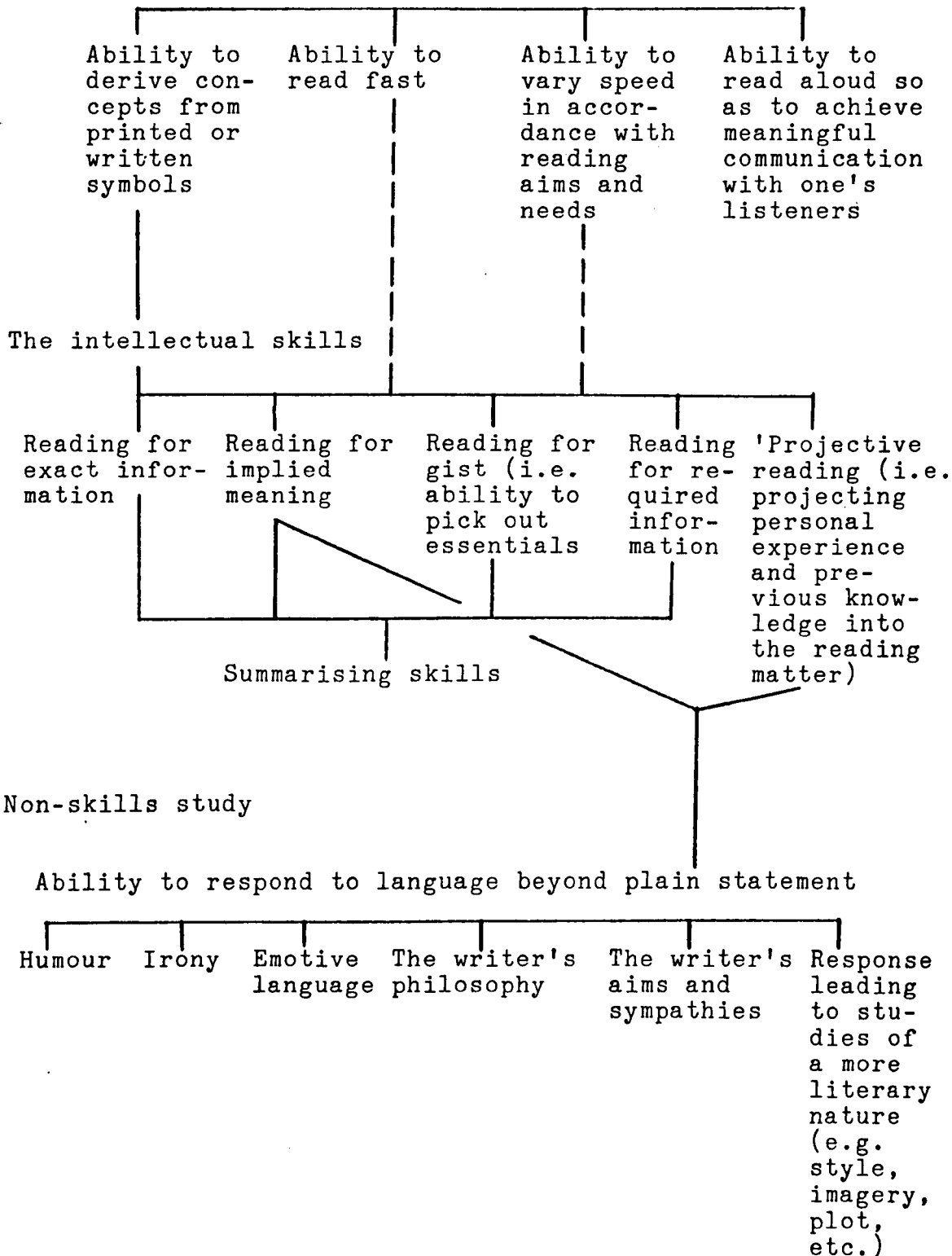


Diagram 21

Therefore I assume that reading processes would be looked upon as intermingled skills whose boundaries are overlapped as shown in something like diagram 22 below:

Creative Reading

Receptive Reading

Skimming and Scanning

Varying Reading Speeds

Reading aloud

Silent Reading

Intellectual

Emotional

mainly for
study purposes

mainly for
pleasure

Intellectual
skills

Mechanical
skills

Diagram 22

Reading Processes

Basically, the reading skills involve a variety of sub-skills which require diagnosis and appropriate treatment if efficient reading comprehension is to be achieved. Consider the following reading sub-skills which are cited by Munby (Munby, 1978:179-184):

- i. recognising the script of a language.
- ii. deducing the meaning and use of unfamiliar lexical items,
- iii. understanding explicitly stated information,
- iv. understanding information when not explicitly stated,
- v. understanding conceptual meaning,
- vi. understanding communicative value (function) of sentences and utterances,
- vii. understanding relations within the sentence,
- viii. understanding relations between the parts of a text through lexical cohesion devices,
- ix. understanding cohesion between parts of a text through grammatical cohesion devices,
- x. interpreting a text by going outside it,
- xi. recognising indicators in discourse,
- xii. identifying the main point or important information in a piece of discourse,
- xiii. distinguishing the main idea from supporting details,
- xiv. extracting salient points to summarise (the text, an idea, etc.),

- xv. selective extraction of relevant points from a text,
- xvi. basic reference skills,
- xvii. skimming to obtain a general impression of the text,
- xviii. scanning to locate specifically required information, and
- xix. transcoding information to diagrammatic display.

It is to be noted that reading involves a constant activity of theorising about the text. Therefore a major consequence of the reading activity is what the reader brings to the text as the meaning of a text is not totally inherent in it. Each reader would question what he reads, and would bring some of his own meaning and contribution to the text, basing his interpretation of what he reads on his previous knowledge of the materials and knowledge of the world as well as what he expects from the writer of the text to convey to him.

The afore-mentioned view of reading in which the reader would be looked upon as having an active role could be illustrated in something like diagram 23 below.

Broadly speaking, efficient reading and developing reading strategies demand on the part of the reader to perceive and interpret lexical meaning, grammatical and rhetorical structures at the textual level. Therefore the interpretation process involves the simultaneous perception and absorption of not only

word meanings, but also relationships between lexis and logico-grammatical structures with and between sentences, paragraphs and text organisations (Mackay and Mountford, 1978b:135).

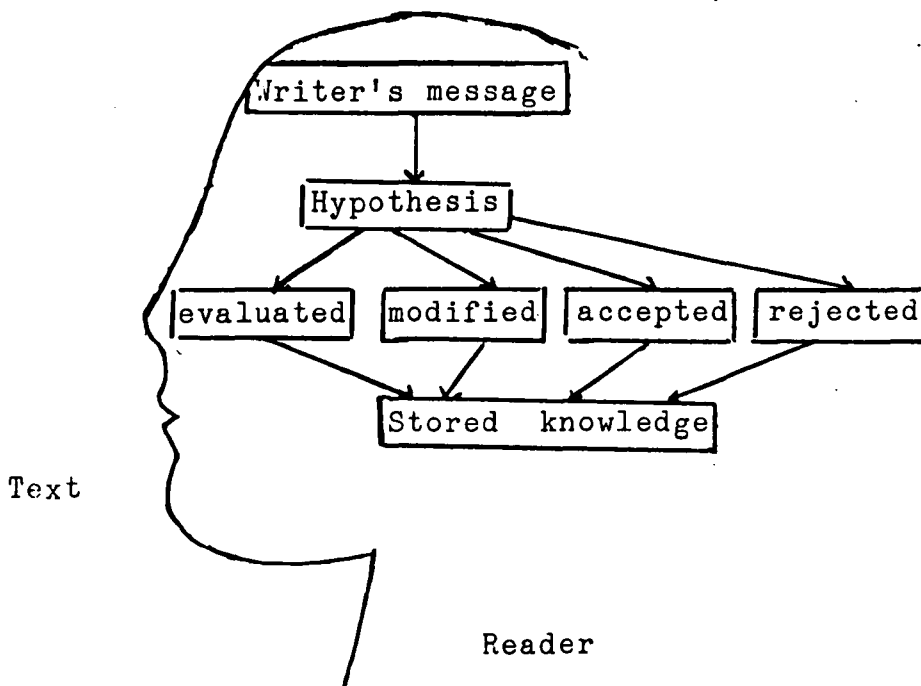


Diagram 23

Given that organising materials, while reading, on a mental scheme for rearranging items of information by identifying the main points and grouping the subsidiary ones together is crucial in text comprehension, students would be trained to organise the items of information they read and learn to benefit from contextual clues.

In fact, reading is central to the learning process, and skills with which every student should be fully conversant in the institutions of higher education. However, in order to close the gap between intention and achievement, there would be a strong case for the re-assessment of the role of reading, an examination and evaluation of methods for improving students' present experience and the introduction of a systematic programme designed for both to extend students' awareness of written materials pertinent to their fields of specialism and to improve their reading skills and reading strategies.

Presumably, the efficiency with which teachers and course organisers would develop reading skills in students is to a large extent dependent on students' general knowledge of life and their previous training and experience in the reading skills, the clarity and efficiency of the objectives of the reading course and their relevance to the students' needs and expectations, teaching techniques and the ability to interpret and apply the outcomes of various types of testing procedures whereby better reading skills would be promoted in the students.

Presumably, one way of developing reading skills is to capture reading and comprehension problems as early as possible. Developing reading comprehension during early years of school education is crucial for self-education and cognitive development on which

advanced education later on in life would be developed. Bloom (1976:66) purports that development of reading comprehension in students should be prerequisite as early as grade 3 during the primary cycle of education.

Traditionally, reading was employed to achieve mainly one goal, namely talking or writing about what one has read. However, current reading programmes would be summarised as paying a great deal of attention to the following activities via reading comprehension:

- i. to get at the main idea of a chunk of discourse,
- ii. to infer meaning and make elaborations or deductions,
- iii. to discuss relationships between different parts of the text,
- iv. to make use of contextual clues so as to discuss other topics relevant to the texts, and
- v. to apply different readings to the given text according to a certain purpose.

This implies that reading in most cases acts not as an end in itself but as a means towards an end whereby knowledge and pleasure are gained, and the learning process as a whole is developed.

Given that the concepts of science and scientific conventions would be transferred from one language to another (Mackay and Mountford, 1978a:13), and previous experience in reading skills would also be made use of in later stages of learning, developing more

complex reading sub-skills, training at the primary and secondary levels in reorganising implicit information and extracting and reordering scientific information in L1 would help much in establishing in the non-native reader an attainment to deal with scientific discourse, as that would develop the reading strategies that the non-native learners use in dealing with scientific texts in a foreign language.

3.3 Integrating Reading into Other Language Skills

Presumably, language skills would influence one another's growth. Just as the refinement of interpretation contributes to the refinement of expression, the refinement of the reading skills would contribute to the development of the speaking process and vice versa (Breen and Candlin, 1980:95). In effect, language skills are so intermingled that it would be difficult to see in real life that they are not interdependent. Grellet (1981:8) points out below how other skills would be linked to reading:

- i. reading and writing, e.g. summarising, mentioning what you have read in a letter, note-making, etc.
- ii. reading and listening, e.g. comparing an article and a news-bulletin, using recorded information to solve a written problem, matching opinions and texts, etc. and
- iii. reading and speaking, .e.g. discussions, debates, appreciation, etc.

The relationship between skills and abilities and between manner, mode and medium constitute common problems in the teaching of both written and spoken language (Widdowson, 1978:77).

3.3.1 Relationships Between Reading and Writing

Producing creative written work such as writing academic essays or a paper for a scientific symposium would be one of the important goals in EST teaching. This activity, in effect, involves a wide range of language attainment. Undoubtedly, the content of what students write is greatly linked to the activity of reading comprehension which would also act as a storehouse of written information which could later on be used by the students when they write essays. Therefore EAP students should be trained to transfer the information gained from reading into writing, depending on the diverse reading-related skills such as note-making and transcoding. Probably, the process of creating a piece of written discourse is also dependent upon reconsidering what has already been written by reading it and then going ahead to formulate the next piece of discourse.

Improving reading flexibilities and attitudes would involve pronunciation practice and a study of the various derivations of the relative scientific items and the semantic relationship underlying them as such practice would familiarise students with scientific and technical terms of the text being studied (Higgins, 1977:44).

Since the communicative methodology is concerned with language function, it would lay much emphasis on productive writing exercises which are pertinent to the development of writing skills. These exercises would require students to transfer identified pieces of information from the written mode into other communicative modes (Johnson, 1981:33). The communicative methodology also stresses the trend towards integration of the four language skills, namely listening, speaking, reading and writing. Therefore the reading skills will be employed to serve other language skills inter alia, by gleaning required information to act as a feedback for oral and written expressions. Hitherto, the communicative approach to teaching reading skills, particularly in EFL classroom situations, would be geared to develop strategies and exercises whereby students are given opportunities to use the language rather than merely to learn it.

3.3.2 Relationships Between Reading and Listening

No doubt, the ability to understand what others are saying is essential to all communicative interaction. Given that listening comprehension indicates that the listener undergoes a process of taking in the oral message being conveyed by the speaker, this mental process would imply that listening comprehension is "an active process of constructing a message from a stream of sound with what one knows of the phonological, semantic, and syntactic potentialities of the language" (Rivers and Temperley, 1978:63).

Actually, listening comprehension is a total process, dependent upon other sub-skills, namely sound and intonation discrimination, interpretation of message, auditory memory, and the ability to understand connected speech (see Chastain, 1979:82). This implies that in the process of listening comprehension, listeners would hold "segments already identified in their immediate memory readjusting their interpretation of earlier segments in accordance with the final message as they understand it" (Op.cit.).

Given that listening comprehension skills would be of crucial significance in developing reading sub-skills such as seminar strategies, group work discussions and note-making activities, I am going to shed some light on this activity, particularly on the parts relative to reading skills.

Broadly speaking, in order to achieve efficient listening comprehension skills, students would be exposed to listening comprehension materials whereby normal extracts of everyday language use are to be employed. This procedure would enable students to transfer their awareness of a pedagogically controlled language discourse of taped language to other discourse types in real language situations.

It seems that teaching listening comprehension in the classroom would also have to cater for the lack of ethnographic cues, specifically paralinguistic ones, which interlocutors would make use of in real life

situations. Probably, looking at a moving picture, a photograph or a picture would familiarise students with the global context of the listening text and put them in the right frame of mind for more understanding of the text and inferring meaning from the connected sound (Howatt and Dakin, 1974:95). Paralinguistic cues are, in essence, crucial in understanding spontaneous speech, particularly when foreign learners are in mind.

Therefore visual materials are of much benefit in developing listening comprehension activities as they can provide a guide, motivation and background for more understanding and assessment of the text (Wright, 1981:117). Interpretation of those visual materials would help develop transcoding activities which would be considered as sub-strategies of reading comprehension and speaking skills. Thus integrating skills would lead to more understanding of spoken and written discourses.

However, listening comprehension skills for EST students would be developed by training them to listen to plenty of dialogues and conventions taken from real life science situations. For example, in the case of medical students, doctor-patient recorded interviews such as those done by Candlin and his colleagues at the University of Lancaster (see Candlin, et al,1974), would be of much use in making students aware of the types of speech acts taking place in those situations.

Of course, such awareness would lead to a greater understanding of oral medical discourses and to the development of listening comprehension skills in the students.

An integration of listening and reading would also be achieved through adapting what Porter and Roberts (1981:47) called "listening and reading exercise" which would be of much use to EST students. In this exercise, students are asked to listen, then simultaneously listen and read, then listen again" (Ibid). This exercise would help students' listening and reading comprehension by making students aware of features of reduction in language form and their association with the stream of sound of the target language.

Given that the lack of listening comprehension of spontaneous speech by the foreign learners would arise from "meeting familiar vocabulary and structures presented as unfamiliar sound systems" (Stanley,1978: 286), students would be presented with types of discorsal language as it is used by native speakers using normal everyday conversational language.

It is worth pointing out that Porter and Roberts (Op.cit.:37) claim that foreign learners of English would face difficulty in listening comprehension in Britain because they are trained to listen to British ELT tapes and cassettes which have RP accent, whereas

what they will normally hear in Britain is diverse dialects of English where RP is the accent of a tiny minority ⁽²⁾ of British speakers. This would imply that English courses for foreign students who intend to further their studies in Britain might have to lay more emphasis upon listening comprehension activities pertinent to other English dialects rather than to RP accents according to Porter and Roberts.

It is true that the English people speak with different accents, but it is also worth stating that foreign students would mainly come to Britain for study purposes, and eventually they go back to work in their own countries. Therefore, their needs and aspirations would be quite different from those of students who intend to stay, live and work in Britain. Since those students' lectures are mainly conducted in RP or a very close approximation to it, I see no plausible reason that foreign students, particularly those who are non-specialists in English language, should be trained to grasp all English accents or some of them instead of being trained to listen and comprehend RP accent. But this assumption should not rule out the possibility of providing students with opportunities to be aware of such accents in the English language.

As far as note-making skills relative to listening comprehension are concerned, students would be given information and advice on these skills. Such information would include a list of common abbreviations

and symbols (see p.334), which would help students write the minimum to give sufficient meaning by concentrating on the main ideas of the lecture, seminar or group work discussions. This assumption would affect positively students' note-making strategies germane to their reading skills.

Actually, note-making would be an important activity in developing both listening comprehension and the skill of writing. It is in fact an effective training, particularly at the beginning of an EST course, to help students get the gist of a lecture in their own field of specialisation by writing down the main ideas presented in the lecture. The procedure is to play the lecture to the students, and they are required to take notes while listening. Then the lecture is played once again to the students so that they are able to fill in their notes where they are incomplete. This activity would also lead to fixing of scientific vocabulary in the students' minds.

Therefore students would be trained to be able to listen to full-length lectures, select salient points and note them down in a clear and meaningful way so that they can retrieve them when they want to do so. Presumably, listening to recorded live and authentic lectures on the students' specialised subjects and doing some exercises on them would provide the EST student with invaluable practice in listening and note-making activities.

3.4 Reading Strategies

Presumably, in the teaching of EST to university students it would be insufficient to develop EST reading materials whose aim is to develop in the students the language skills without taking into account the strategies required by the student which, in the first place, lead to the study of those skills. Therefore, the EST course would cater for the functional aspect of the special repertoire of the students which would be paramount in helping EST students to deal with authentic materials pertinent to their specialisation.

3.4.1 Reading for Intellectual and Affective Information

There is consensus that there should be some reason why people read, and that they switch styles according to their reasons for reading. Broadly speaking, people read in order to obtain information which is reflected in written form. Categorically, this information would be either intellectual, whereby people would develop their intellectual skills so that they would, say, manipulate ideas effectively; or it would be affective information whereby spiritual enlightenment for pleasure or self-improvement is hoped to be achieved (White, 1981:87). Therefore, reading would be done for carrying out a certain purpose.

Though reading and the application of the fruits of reading are separable, it must always be remembered that reading is never pursued for its own sake, even in literature. If the reader finds no "payoff", he will not continue to read (Goodman, 1976:484).

Given that EST students would mainly require reading strategies germane to gaining intellectual information, the EST course would focus on developing such reading strategies and reading sub-skills germane to them.

However, reading would be basically categorised into two strategies: 'receptive reading' and 'creative reading' (see, for example, Ferguson, 1973:30; Pugh, 1975:112; 1978:53; Morrow, 1980:10; Grellet, 1981:4). Actually, those reading styles have, in practice, overlapping boundaries, but they are here categorised, theoretically, for study purposes.

3.4.2 Receptive or Interpretative Reading

In this process, the reader would be limited by the information embodied in the text. His activity would be gleaning or gaining information from the text rather than adding something new to it. He would go further to reason ideas, anticipate endings, make comparisons, discover relationships and transcode information, but with no overt evaluation process

carried out. The sub-skills he would employ in this process would be as follows (Nuttal, 1982:34):

- i. skimming: a process whereby the reader aims to gain an overall idea of the text by quickly going through the text to get at the gist of it or its general impression. Hence, through skimming the reader would become familiar with the text, establish certain expectancies about it, and form a cognitive organisational structure of the text before the linear reading activity commences. Skimming, if done correctly, would help students form an outline of the content in their mind. This outline would guide them during intensive reading activity; and
- ii. scanning: a process whereby the reader runs his eyes over a text very quickly to locate specific or relevant pieces of information. In this activity the reader would not attempt to read whole sentences or paragraphs, but his eyes pass quickly over the page in search of clues which would be later on read thoroughly.

3.4.3 Reflective or Creative Reading

In this process, reflection to and evaluation of the writer's ideas embodied in the text would be achieved by the reader. He may evaluate the effect the writer aims at from writing his text. He would judge the quality, value, accuracy and truthfulness

of information (Ibid: 10). He would spell out new ideas not embodied in the text and from which the text would benefit a lot. He would even reject or modify information found in the text.

3.5 Intensive Reading

Efficient reading involves adapting the reading technique and speed to their purpose behind the reading skills. Intensive reading is more an accuracy activity which involves reading in detail texts which are mainly written for study purposes. Probably, the information students get in reading would be applied in some further needs which can be learned and practised (White, 1981:87).

In intensive reading activity, text assessment and evaluation is of crucial significance as it would lead to effective understanding of the text which in turn would lead to building of efficient reading strategies. The attitude of the writer and writer's intention would be dealt with, assessed and evaluated. In dealing with scientific materials, however, the reader should be able to discriminate facts from opinions. In that respect, the language used by the writer and the way he arranges his text would, of course, contribute to conveying his meaning. Therefore, in this type of reading, the writer's ideas expressed in the text and those which would be implied should be discussed and evaluated. In essence, reacting to

the writer's ideas is a necessary component of any intensive reading comprehension skill.

It is interesting to note that one of the intensive reading sub-skills is scanning or search-reading whereby extraction of the main ideas in a certain passage or text is carried out. This sub-skill would considerably facilitate reading comprehension, and could be developed by practising reading as many texts as possible which are relative to the student's field of specialisation.

No doubt, one advantage of the reader-writer relationship over speaker-listener relationship is that in the former it is the speaker who mainly controls the activity, particularly in a lecture situation, whereas in the latter the initiative remains with the reader (Hill, 1981:271). The reader can slow down or speed up the communicative process according to his level of comprehension. Therefore, we notice in intensive reading that the reader has a certain aim in mind when he comes to read a certain text. He will look for particular information to be comprehended, made use of and be retained for the sake of retrieving. Therefore, he checks now and then when he reads that he has interpreted enough of the reading material that would satisfy his purpose.

It must suffice to remark here that traditional experimental reading research concentrated on the improvement of mechanical speed reading rather than

on intensive reading. Thus, a good reader was described as tending "to have a wide eye-span, to spend less time per fixation and to make fewer obvious lip movements" (Pugh, 1975:114). However, it seems that mastering speed reading would come at a hyper level of the reading process where competence in both language and subject matter would be at its highest level, specifically in the case of a native speaker specialist or a foreign subject matter specialist who has a native-like competence in the target language.

Actually, I am dubious of any teaching model that would attempt to capture speed reading activity in a foreign language teaching setting before firmly establishing a process whereby intensive reading would be achieved with efficient understanding, particularly in an EST course where efficient reading would be prerequisite for subject matter absorption. Thus speed in reading the value of which to most readers is, however, still questionable (Pugh, 1978: 49), should not be developed at the expense of efficient comprehension, particularly with students studying science in a foreign language.

It is worth pointing out that in EST reading it is important to learn how to approach a new text. This activity would be paramount in putting oneself on the right path of effective reading skill strategies. The following steps are helpful in approaching a new scientific text (Grellet, 1981:10):

- i. Consider the text as a whole, its title, accompanying picture(s) or diagram(s), the paragraphs, the typeface used, and make guesses about what the text is about, who wrote it, who it is for, where it appeared, etc.
- ii. Skim through the text a first time to see if your hypotheses were right. Then ask yourself a number of questions about the content of the text.
- iii. Read the text again, more slowly and carefully this time, trying to understand as much as you can and trying to answer the questions you asked yourself.

Presumably, developing silent reading skill would be of significance in improving both intensive and extensive reading activities. Unlike reading aloud, which would distract the reader's attention, particularly in a classroom situation, silent reading would help students concentrate on the content rather than on the way they spell out the words. Silent reading would best be followed by group work discussions as students would probably give several interpretations of a text. Each group of students could also be given a different text to work on, and then asked to talk or write about what they have read. Of course, this procedure would help stimulate drawback students to participate. Groups may exchange partners so as to compare results before the whole class is involved in

a general discussion. This procedure would help integrate the other language skills with reading, particularly if students were then asked to summarise the text in the light of the discussion carried out in class.

3.6 Extensive Reading

Extensive reading is a fluency activity mainly involving global understanding for extensive materials. In most cases, this reading activity is carried out for spiritual enlightenment. It would also be of much value in developing reading skills for intellectual information.

One of the styles which is crucial in extensive reading is developing flexibility in global reading skills. Flexibility in reading would be developed through developing skimming and scanning strategies of the student, though this activity would also be hampered by the difficulty of the discourse and the level of the reading competence of the student (Ferguson, 1973:31). Indeed people differ in their reading competence for various reasons, including problems of unfamiliar vocabulary, ignorance of facts or intellectual limitations. Therefore some readers may find no difficulty in interpreting a text, while others may find the same text very difficult.

Basically, flexibility in reading depends upon three factors: the fixation time, the number of

fixations per line, and the frequency of regressions. Fixation pauses refer to the periods of clear vision whereby perception takes place. Regressions refer to the movements of the eyes backwards towards the beginning of the line to re-read materials in order to get a clearer view about it before advancing to new information. Thus, this activity involves organising and retrieving the essence of what is read (Pugh, 1978: 55). Apparently, regressions occur when the reader finds a link between what he is reading and a previous piece of information or when he feels that some previous material needs more concentration and requires to be read again (Op.cit.). Regressions are, in effect, due to imperfect comprehension. Therefore, the fewer regressions, the more flexible is the reading process. In fact, EST learners would improve their reading flexibility by improving their general grasp of English and their knowledge of their field of specialisation in English.

Given that the reader of science and technology would be concerned with gaining the message rather than with the language itself (cf. White, 1981:88), reading with understanding and flexibility extracting the required information from the science text as efficiently as possible would be the target of the EST student so that he would be able to diagnose the relevant information which he needs when he deals with his science materials (cf. Grellet, 1981:4).

Practically speaking, in order to develop extensive reading activity, students would be encouraged to progress beyond word-by-word reading, and their aim would be to get at the global meaning of the text. In order to achieve that goal, the teacher would try to help his students by (Selinger, 1972:52):

- i. avoiding making reading laborious to his students by presenting them with materials that would match their reading abilities; too-difficult materials would hamper students, preventing them from focusing on the communicative content of the message; and
- ii. discouraging students' dependence on the dictionary and encouraging them to guess the meaning of the difficult words through the context; understanding particular words in a text is not really vital for global understanding of that text.

Experiments in reading which were carried out on foreign students have shown that flexibility in reading and developing reading ability with comprehension have the following advantages for the foreign language learner (Ferguson, 1973:34):

- i. Comprehension is higher;
- ii. the main idea can be isolated;
- iii. the student is not held up by unknown vocabulary and can be trained to read unsimplified texts from the start;

- iv. the fact of being able to read a 'live' text is a very great motivator;
- v. confidence is built up; and
- vi. the text can subsequently be studied, completely or in part, in order to examine new words and expressions.

It is worth mentioning that foreign readers would also face difficulties relative to problems of vocabulary and discourse as well as difficulties relative to their inexperience of fluent reading in the target language. But by being aware of their limitations, they would know how to improve their reading skills. Making progress would also depend upon the advice and training they receive in that respect.

However, it is still difficult to evaluate accurately the reading rate of foreign students in the target language. As in most cases foreign students are evaluated on norms of reading rates for native speaker learners⁽³⁾. On the other hand, those reading rates would mention only the reading speeds and the comprehension level of the testee with no mention of how difficult the written discourse was (Kelly, 1981: 176). Therefore, it would be plausible to think of establishing a procedure whereby speeds level of reading comprehension is to be evaluated on a scale which would take into consideration the diverse factors that would affect the non-native speakers' reading skills.

Undoubtedly, extensive reading in the target language, particularly the reading of current journals and articles, would bring some students into contact with up-to-date repertoires of science in that language. This in turn would eliminate students' mother-tongue interference and enrich their vocabulary and terminology in the target language. It would lead as well to mastery of the scientific discourse written in that language (cf. Sikiotis, 1981:300).

EST students would be helped to increase and check their flexibility in reading by recording their reading speed in a note-book and try to improve it each time they read a new text, provided that adequate comprehension of the text is achieved. This student-centred activity would give students the opportunity to evaluate their work and try gradually to improve their reading speed and build up self-confidence. A conversion table whereby the reading time, length of the text and complexity of material, is to be drawn up and taken into account in evaluating the student's flexibility in reading would be crucial.

Therefore, an effective reading skills course would have the following objectives for developing students' reading strategies (Nuttal, 1982:146):

- i. Use of skimming when appropriate to ensure that he (the student) reads only what is relevant, and to help subsequent comprehension;

- ii. Use of non-text information (especially diagrams, etc.) to supplement the text and increase understanding;
- iii. To read in different ways according to his purpose and the type of text;
- iv. Not to worry if he does not understand every word, except when complete accuracy is important;
- v. To recognise that a good writer chooses his words carefully and would have meant something different if he had chosen A rather than B;
- vi. To make use of the reference system, discourse markers, etc., to help himself to unravel the meaning of difficult passages;
- vii. To be aware that a sentence with the same signification may have a different value in different contexts, and be able to identify the value;
- viii. To be able to make use of the rhetorical organisation of the text to help him to interpret a complex message;
- ix. To be aware that a writer does not express everything he means, and to be able to make inferences as required;
- x. To be aware that his own expectations influence his interpretation and recognise those occasions when the writer's assumptions differ from his own;

- xi. To be aware, when necessary, that he has not understood the text, and to be able to locate the source of misunderstanding and tackle it; and
- xii. To respond fully to the text in whatever way is appropriate.

3.7 Study Skills Relative to Reading Comprehension

3.7.1 Introductory Note

In order to develop the global activity of reading skills, it is assumed that students would be trained to develop reading comprehension strategies whereby various reading sub-skills related to the student's reasons for reading are to be trained and developed.

Actually, interest in study skills dates back to the 1950s. The late 1950s witnessed some publications (see, for example, Morgan and Deese, 1957) which were aimed at training learners to be better students. The language teaching fraternity nowadays, however, tends to deal with short-term goals and more directly relevant skills to students' specialisations.

Given that the main objective of the teaching of reading is to bring about changes in the student's level of reading competence and attitudes towards the reading skills and techniques which are arranged in the reading programme of the students, the teacher in this respect would use methods of assessing reading attainments that would help him implement and assess

the outcomes of his reading programme. Thus the teacher would be concerned with the following related tasks in the teaching of reading (Pumfrey, 1977:6):

- i. the assessment of the student's current reading skills;
- ii. the specification of objectives;
- iii. the facilitation of the student's achievement of objectives;
- iv. the assessment of the development of the reading programme; and
- v. interpretation and evaluation of the results obtained, and development and repetition of the cycle.

As far as teaching EST reading skills is concerned, the teacher of EST would be mainly concerned with the methodology of teaching science and the process of transferring reading skills from the vernacular into the target language. In essence, the communicative methodology of science as a subject, and the application of analysis of scientific discourse and its application to the teaching of English to students of science and technology would be precisely the EST teacher's concern. This premise gears our attention to the notion that the reading sub-skills to be emphasised should be those which would help both students and teachers achieve that objective.

It is worth pointing out at this stage that the ESP teacher would have to pave his way in a solid stoneground. His professional life would not be easy unless his ESP teaching were responsive to his students' needs and expectations. In a learner-centred teaching/learning process, the more background and knowledge the teacher gets in his students' field of study and the study skills they require, the more confident he will be in handling his ESP work.

The whole ESP approach offers such prospects of real job satisfaction for the teachers, but only if they are prepared, for the sake of their students, to put considerable effort into exercising and developing their professional pedagogic skills (Allwright and Allwright, 1977:62).

Actually, it is not only the ESP teacher who is in need of salient training in teaching science materials, but it is also the curriculum writers in this area who are in need of adequate training in order to provide much clearer guidance in dealing with scientific materials and attitudes which would match the needs of the students (Schibeci, 1981:458), as confusion in science-related attitudes such as lack of coherence among the topics in the science curriculum would lead to the confusion of both teachers and students.

The afore-mentioned argument stresses the assumption that the major difference between ESP and general EFL courses is that the former has a specified task relevance, whilst the latter has no short-term objectives. Since mastering study skills comes under the umbrella of short-term aims of learner-centred courses, it is difficult to conceive of an EST course which does not put any emphasis on study skills in English. Actually, emphasis upon study skills emerged when language teaching was directed to cater for the needs of the learner and the functional aspect of language (Price, 1977:26).

Generally speaking, the communicative methodology acknowledges that helping students deal with the target language communicatively would be achieved by giving the students instructions and opportunities to use the target language productively (McGrath, 1979:35). This premise would be implemented by training students to develop the skills which their studies require so that they would get the most out of their course. Hence, EST students would be engaged in activities and sub-set of skills which would be appropriate to their needs and expectations. Such a tenet would have, in effect, a far-reaching implication for the structure of an appropriate EST course.

... a knowledge of study skills may
make for a more efficient student,
it will probably make for a more

motivated student and it will hopefully make for a student with greater communicative competence (Price, 1977:29).

Categorically speaking, in an EST course where the objective is to develop EST reading skills, the following study skills would receive paramount significance (see, for example, Jordan, 1977; Swales and Fanning, 1980; Kennedy and Hunston, 1982).

3.7.2 Note-Making

The note-making process pertinent to reading skills comprises some main sub-skills, namely the ability to select salient points of a reading text, reduce a discourse and parts of a discourse without loss of meaning, perceive basic relationships between different ideas in a text, and be able to read through the gleaned notes and produce a coherent text without losing the meaning of the original text, and put them to some use, namely for revision (Heaton, 1977:30).

In order to implement the afore-mentioned assumptions, the teaching of note-making should make students aware of how arguments are developed and help them understand how to separate essential and relevant information to note down from non-essential and irrelevant information in a text.

Since note-making involves omission and word compression, the EST teacher has to deal with grammatical properties which would help develop in the

student the ability to grasp the semantic and syntactic significance of functional and structural words in gleaning and retrieving information at the discursive and textual levels. Thus, a course on note-making would require the teaching and revision of pronominalisation, nominalisation, passivisation, relativisation, determiners and auxiliary verbs, as well as the teaching of connectives. Heaton (Ibid) cites the following examples for teaching the skill of word omission to EST students:

i. (It was possible to take some films of the lunar surface)

Possible take films lunar surface

ii. (Acids are among the most dangerous of chemical substances)

Acids = v. dangerous chemical substances

iii. (Where a supersonic airliner is approaching its destination, it will reduce its speed while it is still above 45,000 feet)

Supersonic airliner approaching destination
speed 45,000 feet.

Actually, the word omission technique takes into consideration the following notions (Dudley-Evans, 1977:39):

i. the removal of redundant items such as articles, the verb 'to be', auxiliary verbs, and unnecessary repetitions. For reconstitution of notes, these items are put back in;

- ii. the reorganisation of information, e.g., using one word to represent a complete idea;
- iii. abbreviations; and
- iv. the representation in symbol form of the relationships in the text.

It seems, however, that Heaton's examples of word omission above would require advanced skills in the target language on the part of the learner as well as the need for a fairly good knowledge in the field of specialisation of the learner, so that students should be aware of what information should be deleted; and an adequate command of science discourse to retrieve the original meaning of the text. Therefore, the EST teacher should be careful when adopting word omission technique and watch out for his students' standard in the target language and their knowledge in the subject matter of their study.

The use of abbreviations, signs and mathematical conventions to replace content words and logico-grammatical items would be of much help in a note-making activity in an EST course. The following signs and symbols cited by Heaton (1977:31) would be of much use for EST students who are already familiar with mathematical signs and conventions.

= is, equals, is the same as, is like, is equivalent to, is synonymous with, may be regarded as, consists of, is made up of, is called, represents, is on a par with, etc.

- leads to, causes, results in, becomes, moves towards, passes into, makes, is converted into, is formed into, etc.
- ← comes from, results from, develops from, is a result of, is caused by, is produced from, is made from, is based on, etc.
- ↗ grows, increases, becomes larger, rises, climbs, improves; more, greater, increasing, rising, growth, increase, improvement, etc.
- ↘ decreases, reduces, lessens, shrinks, becomes less/fewer, drops, falls, deteriorates, sinks, goes down, lowers; less, fewer, weaker, decreasing, reducing; decrease, reduction, decline, deterioration, depreciation, etc.
- . . . therefore, thus, so, then, consequently, with the result that, as a result, so that, etc.
- . . . because (of), as, since, for, as a result of, on account of, owing to, due to, now that, etc.

It is to be noted that foreign EST students would face writing difficulties in note-making as the mother tongue of the students, their educational background and, in essence, their level of competence in English would impinge on this skill (cf. Edge, 1983:93). Therefore, spelling difficulties using appropriate lexis and correct verb tense usage as well as making notes from a text would be serious difficulties for foreign EST students.

Presumably, note-making activity pertinent to listening comprehension skills would be a compound problem for EST foreign students who are furthering their studies in an English-speaking milieu, e.g. Britain, as the lecturer's style, speed, accent and the use of some colloquial expressions would cause those students added difficulty. Jordan et al (1978: 15) found out in their study that the problem of note-making for EST students from Arab-speaking countries was further compounded due to their need for operating at speed and in a different linear direction in the writing system.

The afore-mentioned argument implies that foreign EST students would require added note-making sub-skills and techniques which would match their needs, background, abilities and aspirations.

3.7.3 Academic Report Writing

One of the main aims of EFL programmes from developing proficiency in EST reading skills would be to train EST students to perform acts through contextualised guided writing activities designed to help them identify scientific rhetorical functions in the context of published scientific and technical materials including the extensive use of charts, tables and diagrams. Hitherto, the ability to write an acceptable scientific English in a laboratory report, short essay, clinical report, and, with more advanced students,

scientific paper for a symposium, etc., have become a major concern of students and teachers of science and technology.

Organising laboratory reports has become an important skill for undergraduates because, presumably, all EST students on the preliminary year would be required to do laboratory work and expected to present written reports and/or seminars of their work between now and then. Therefore it is necessary that EST students be given guidance as to how to organise such reports, and be aware of the scientific discourse used in that respect.

However, a full laboratory report would normally deal with the following information in its units (see Turabian, 1967; Parsons, 1973):

i. The Abstract

The abstract is a brief summary of contents of the report. It should contain the most important details and results arrived at in the report. Actually, the length of the abstract may be affected by the amount of the report and the results arrived at, however, it should, often, not exceed ten lines in length.

ii. Preliminaries

This section includes the theme and the purpose of the report with the review of literature on the subject.

iii. Experimental Section

The main body of the investigation in the report is pointed out in this section. Novel aspects of the apparatus and refinement or modification carried out should be clearly described. Graphs, diagrams and illustrations are of much help in making the experiment more vivid and easily interpreted.

iv. Conclusion and Suggestions

The general implication of the results of the research and its possible application to the fields are indicated in this unit. Problems should also be identified and tentative solutions would be suggested if possible.

v. References

This is also an important part of the report which students should be well-instructed to follow. Students should state: author's name, date of publication, title, publisher and place of publication. Volume numbers, journal numbers and pages should be identified in the case of journals.

Dudley-Evans (1977:40) purports that EST students at undergraduate level would be involved in laboratory experiments to establish the validity of existing science laws rather than with getting mainly at novel information. Therefore, what they require most of language discourse is that discourse which is

mainly relative to description, comment and contrast. Discourses, like the following which are cited by Dudley-Evans (Ibid) would be expected.

- i. 'Material x was found to have a relative density of ..., which is consistent with/significantly different from the accepted value as found in the standard reference book' (Comments).
- ii. 'This error may be due to incorrect calibration of the instruments' or 'The discrepancy may be the result of incorrect measurements' (Comments).
- iii. 'x has a considerable higher relative density than y' or 'The result for x is consistent with the accepted value (whereas) that for y is significantly different' (Comparisons).

In an essay-writing activity, the section dealing with developing the main body of the essay would be one of the main parts of essay-writing skills which foreign EST learners would find difficult to master, probably, due to their inadequacy in language use in the target language. Price (1977:28) suggests the following language items to be practised in order to develop students' ability in this respect.

i. Initial statements

In considering the first part } it {can} be {stated
dealing with } {may} {claimed
To return to the first point } {said
Firstly,

ii. Exemplifications

As an example of this, } { it has been {proved} that...
To illustrate this point } { shown }
For the purpose of } { there is proof to {show ...
illustrating this point } { support... }
research shows that

In support of } this { opinion { I can quote x
To support } { statement {
To back up } { view { x can be quoted

Furthermore }
In addition } it can be seen that ...
Moreover }

iii. Results

Thus } as a result of { this evidence } it can be seen
Hence } { these facts } that

What { results/emerges/follows } is that...
{ may result/emerge/follow }
{ seems to result/emerge/follow }

Resulting /emerging from these facts is the situation
where

It follows from this that

iv. Moving on to the next stage

On the other hand, there are other { points of view ...
{ aspects to the
{ problem

These are not the only factors to be considered,
however

Specifically speaking, medical students and students of pharmacology would be in need of acquiring the skills of clinical report writing. Presumably, EST teachers' task in that respect would be to provide their students with medical materials whereby the case histories of certain patients are presented and students are asked to discuss each case in group work activities after careful reading.

Clinical problem solving in simulation activities in the classroom or laboratory would be of crucial potentiality in developing clinical report writing skills and note-making activities. Providing problems drawn from authentic medical sources would provide students with both the medical information, diagnostic skills for practising clinical problems and also clinical writing skills which they would require in their current study and future profession (cf. Allwright and Allwright, 1977:60).

Given that developing clinical report writing would best be relative to the people of the respective country of the students, it seems to me that medical students would also be presented with medical problems (symptoms, details of history, clinical examinations of tests, details of tests, etc.) in their native language.

Presumably, transcripts of clinical problems which are fairly frequently printed in medical journals would also be of much use for selecting medical data for students of medicine and pharmacology

and could be a useful feedback for academic report writing.

3.7.4 Seminar Strategies

One of the EST students' requirements during their undergraduate study would be to deliver a seminar or tutorial on their research. In this activity, they will be called upon to explain analytically what they have done in that research and have to answer questions relative to their talk. Mastering seminar strategies would lead students to be aware of the functions of language used in this activity which in turn would lead them to gain more confidence in expressing themselves and dealing with purposive discussions.

In addition to the general skills in seminar strategies, EST students would require some sub-skills which students usually practise in research or report writing, such as giving an introduction, dealing with the main topic and summing up the main purpose of the seminar. However, there are some language functions used in seminars which would be of crucial significance to be mastered by EST students, particularly foreign students. These sub-skills are as follows (Price, 1977:28):

- i. interrupting
- ii. asking questions
- iii. expressing general comments
- iv. agreeing

- v. disagreeing
- vi. expressing criticism
- vii. expressing objections
- viii. expressing doubt
- ix. making suggestions.

It is to be noted that EST students should try to reduce repeating themselves to the minimum. Genuine answers on the other hand would reflect the student's command of the knowledge to be displayed in the seminar.

Finally, it would be of much use if seminars could be supervised and assessed by collaboration of the EST teacher and the teacher of the special subject.

3.7.5 Reference Skills

Developing reading skills in a foreign language requires that students would be well-equipped with all relative reading sub-skills of which using library references is crucial, particularly when the knowledge of life and language systems, specifically the alphabet, are dissimilar in the native language and the target language.

Developing reference skills means helping students to appropriate selection of books, journals, articles and texts in a library whose contents are pertinent to their needs; looking up references in an index entry or bibliography, and consulting a dictionary or encyclopaedia germane to his field of specialisation (Geddes, 1977:20). The correct use of card

catalogue, microfiche, audio-visual materials concerned with using the library's resources would be an experience which students would highly appreciate. Students should also be trained how to identify relevant information and quotations from references.

Presumably, the best way for developing reference skills is through practice. Students would first start practising exercises which cover the use of bibliographies, dictionaries, indexes, etc. under the supervision of the teacher. Then individual practice is important. Writing short essays to be assessed by the teacher will be a useful exercise for teaching the use of reference skills. Taking students to the library to practise reference activities would put them in the real picture of the activity. The teacher would seek the help of the library staff to aid in making the students familiar with the library contents and library activities such as looking up the library catalogue and finding the book on the shelf, as well as being aware of the library services such as borrowings, renewals, loans and reservations. Other facilities available in the library such as photocopying and binding should also be identified to the students.

University libraries would, in most cases, issue library guides, and the teacher can make use of information in those guides for the benefit of his students in making use of library facilities.

3.8 Issues in EST Reading Material Design

3.8.1 The Problem of Relevance

Presumably, the motivation variable plays a major role in EST learning/teaching situations. This would be facilitated by providing students with scientific materials which EST students find interesting and pertinent to their field of specialisation. Suitably graded materials would also aid in this respect in that students would not be daunted by complex science texts from the beginning of the EST course. In effect, often, complexity of structure and new complex vocabulary would hamper the process of reading comprehension which would in turn lead to a break in communication and diminishing of interest. Hitherto, in order to facilitate comprehension and making interest in the scientific materials, carefully graded transition from familiar to unfamiliar materials would be provided.

It is to be noted that traditional approaches to language teaching of scientific materials have greatly affected students' attitudes towards the target language as they have predisposed students of science and technology to look on scientific language as a content subject rather than as a means of communication. Such approaches might have deprived students of science and technology of having access to tremendous and valuable knowledge of scientific fields (Bates, 1978:80). Therefore, traditional EST courses

have been based on a structural syllabus the learning objectives of which are formal items whereby progression is decided mainly on formal criteria (Jones and Roe, 1976:19). Thus, traditional EST materials have been based on the course designer's predicated objectives rather than on the students' needs and expectations.

Equally significant to mention at this stage is the assumption that language teaching research based on communicative pedagogy perspectives has been directed towards learners' development in dealing with certain kinds of discourse rather than with their automatic reproduction of the sentence-level grammar of the target language. This implies that course designers, teachers and test constructors would also be concerned with discourse type activities and language teaching/learning techniques relative to the communicative language functions. But in order to design an effective EST syllabus "we need to know what communicative problems we are trying to solve before we design a syllabus, coursebooks, readers, or any particular learning resource or aid" (Ibid).

Presumably, scientific materials would sustain a high degree of response on the part of the learner if he feels that the materials would cater for his needs as a scientist on the one hand, and if the learner genuinely enjoys his English classes on the other.

In other words, the EST materials in order to be effective, must be relevant to the learners' long-term objectives and should have immediate appeal to facilitate the learning effort.

3.8.2 Scientific Terminology

Given that the communicative approach to language teaching has geared attention to the functional feature of the scientific language and put heavy emphasis on the textual facets of the scientific materials, the communicative acts, namely, describing, predicting, hypothesising, rejecting, concluding, etc. have become the prime concern of any communicative EST course as it is assumed that such features would be what students of science require out of learning the target language. Corollary to this, logico-grammatical elements, connectives, anaphora and cataphora which are pertinent to grammatical cohesion and language coherence (see Halliday and Hasan, 1976:206) would also be given adequate attention.

As far as reading science materials is concerned, the reading process would embody abilities of predicting, recalling, synthesising and critically assimilating information: a process which, in effect, demands on the part of the EST students the mastery of the global facets of the target language. Therefore, texts selected for developing reading skills should help build in the students longer streams of meaning whereby contextualisation would help develop the

attitude of intelligent guessing when dealing with the meaning of new vocabulary in the text.

Given that efficient reading comprehension of scientific texts would require perception of the basic skills of decoding, word-association, and word-analysis, one of the important objectives of the EST materials would be to make students aware of the scientific terminology germane to their field of study. Affixes of Greek and Latin origin used in the formation of most English scientific terminology would be of vital importance to foreign students of EST (see, for example, Appendix 2, which is cited by Strevens, 1980:133-5). Wilardjo (1976:141), however, purports that if EST students are helped to learn between ten and fifteen new words per teaching hour relative to their field of study, it would be an effective procedure towards increasing their EST vocabulary span.

However, it is true that students trained to guess the meaning of new lexical items from contextual clues in the text might become good readers, but it is also true that this contextual guessing would be hampered and comprehension would consequently be blocked if the percentage of unknown vocabulary begins to surpass the reader's comprehensible capacity, and thus makes the text incomprehensible (Swales, 1980: 122).

Contrary to Lee Kok (1976:7), who purports that ordinary content words, conjuncts and connectives would be the most difficult type of the lexicon of scientific writing, whereas lexis with Latin and Greek roots would be the easiest, I assume that the students of science would already be aware of most conjuncts and connectives from their pre-EST courses, therefore they would be easier to master, whereas lexis with Latin and Greek roots would still be unfamiliar to them; besides, their compound semantic components would constitute an extra load on them.

Actually, communicating lexically is one of the important activities of scientific fields. The communicative lexicons constitute one of the crucial characteristics of special purpose language acts. One would not master a specific scientific field solely through studying the language associated with it, but also by gleaning experience in the field itself, of which lexicons which are characteristic of that field constitute crucial elements in special experience accumulation (Anthony, 1976:93).

We should also bear in mind that merely dealing with the lexicons and grammatical elements of the target language at the sentence level in the hope that the L2 learner would apply them appropriately when he uses the target language would not suffice to achieve the required communicative reading attainment in the students, as word and sentence comprehension are in

turn dependent on knowledge and expectations about sentence relations and discourse structures (Van Dijk, 1981:13). This implies that in pedagogical treatment of EST reading materials grammatical elements and vocabulary, though important, would best be viewed within the domain of discursal and textual analysis.

3.8.3 Textual Analysis and Awareness of Rhetorics in EST Texts

A text would be defined as a semantic unit of language consisting of smaller units of discourses linked by textual and paragraphical devices which are either grammatical, semantic or logical (Dubin and Olshtain, 1980:355). Therefore, the material to be taught for foreign EST learners would be set in such a way as to reflect implicit information that the non-native reader needs to know in order to gain access to the total meaning of a scientific text.

Before the advent of the communicative era of language teaching, however, linguistic analyses have been restricted to the analysis of paradigmatic aspect of sentences rather than their syntagmatic aspect. In the 'Transformational Grammar' view of language, structural analysis of sentences and their transformational rules are viewed as the elements that represent "the basis for the actual use of language by the speaker-hearer" (Chomsky, 1965:9).

An important observation to make is that the structuralists assume that the list of lexical and

grammatical items constitute what the learner needs to know - a knowledge of the English system. In the functional syllabus, it is assumed that the list of functions is what the learner needs to learn - the appropriate use of language. Thus, the structural syllabus provides a certain form and the syllabus designer has to provide a contrived situation whereby the form could be realised in an appropriate situation, whereas the functional syllabus provides a given function and the teacher has to 'create' an appropriate situation to realise the function in use (Widdowson, 1979:249).

Therefore, communication would not be achieved by composing or understanding language below discourse level, but by using such elements to function as part of a discourse or text whereby diverse acts of a social nature would be achieved. Such acts would include: apologising, classifying, describing, hypothesising, repeating, so on and so forth (Widdowson, 1972:119). Garvey (1975:61) quoted in Coulthard (1977:169) stresses the significance of the ability to execute speech acts in the process of learning discourse production by stating:

... learning to produce discourse can be understood as learning to perform the component of speech acts, learning the relative order of these behaviours, and learning the appropriate distribution of roles which the alternating turns require.

Presumably, foreign learners would suffer from a compound difficulty of lack of knowledge of the structural and cohesive items as well as lack of awareness of rhetorical styles in the target language (Dubin and Olshtain, 1980:357). Therefore, in order to get at the global meaning of the EST discourse, the non-native reader of English would be trained to extract and reorder communicative information pertinent to definition, classification and other information relative to rhetorical functions (Selinker et al, 1976:55). Hitherto, EST students would be trained to be aware of cohesion in English, which would help develop the ability of relating ideas through agreement, addition, contrast, concession, etc., which are often employed by the writer to put the text together (Op.cit.:360).

Given that implicit meanings in sciences are more difficult to comprehend by non-native speakers than explicit meanings because of their assumed failure to grasp implicit rhetorical information displayed in the reading text (Flick and Anderson, 1980:350), science materials would concentrate, at the first stages of the EST course, on explicit rhetorical functions rather than on implicit ones until the gap narrows between the comprehension of implicit and explicit information as students gain more proficiency in their reading skills in the target language.

Interrelation between the various levels of EST rhetorical process which deals with the implicit and explicit information germane to scientific discourse on the paragraph level is shown in diagram 24 below and continued on page 187 which is formulated by Selinker et al (1976:56).

Diagram 24

Rhetorical Process Chart

English for Science and Technology (EST)

Level	Description of level
A	<p>The Objectives of the Total Discourse</p> <p>Examples:</p> <ol style="list-style-type: none">1. Detailing an Experiment2. Making a Recommendation3. Presenting New Hypotheses or Theories4. Presenting Other Types of EST Information
B	<p>The General Rhetorical Functions Employed to Develop the Objectives of Level A</p> <p>Examples:</p> <ol style="list-style-type: none">1. Stating Purpose2. Reporting Past Research3. Discussing Theory4. Stating the Problem5. Presenting Information on Apparatus: Description6. Presenting Information on Apparatus: Operation7. Presenting Information on Experimental Procedures8. Referencing an Illustration9. Relating an Illustration to the Discussion

C	<p>The Specific Rhetorical Functions Employed to Develop the General Functions of Level B</p> <p>Examples:</p> <ol style="list-style-type: none">1. Definition2. Classification3. Description: Physical and Function4. Description: Process								
D	<p>The Rhetorical Techniques that Provide Relationships Within and Between the Units of Level C</p> <p>Examples:</p> <table border="0"><tr><td>1. Time Order</td><td>5. Comparison</td></tr><tr><td>2. Space Order</td><td>6. Contrast</td></tr><tr><td>3. Causality</td><td>7. Analogy</td></tr><tr><td>4. Result</td><td>8. Exemplification</td></tr></table>	1. Time Order	5. Comparison	2. Space Order	6. Contrast	3. Causality	7. Analogy	4. Result	8. Exemplification
1. Time Order	5. Comparison								
2. Space Order	6. Contrast								
3. Causality	7. Analogy								
4. Result	8. Exemplification								

However, it seems to me that Selinker et al (Ibid) have stressed in their Chart above only the receptive language facets to be communicated between the writer of a scientific text and his reader, leaving creative attitudes which would be embodied in such texts untouched. Therefore, in order to shed some light on those attitudes which would constitute crucial parts of an authentic communicative text, I have modified their Chart as shown in diagram 25 below (on pages 188-189).

Diagram 25
Rhetorical Process Chart (EST)

Level	Description of Level
A	<p>The Objectives of the Total Discourse</p> <p>Examples:</p> <ol style="list-style-type: none">1. Prefacing a Report or Essay2. Reflecting and Commenting on Reviewed Literature3. Detailing an Experiment4. Presenting New Hypotheses or Theories5. Presenting Other Types of EST Information6. Persuasion7. Suggesting Further Research
B	<p>The General Rhetorical Functions Employed to Develop the Objectives</p> <p>Examples:</p> <ol style="list-style-type: none">1. Stating Objectives and Value of Study2. Making a Recommendation3. Reporting Past Research4. Discussing Theory5. Throwing Doubts on Other Ideas and Theories6. Stating the Problem7. Suggesting Tentative Solutions8. Describing Apparatus9. Describing and Organising Information on Experimental Procedures and Operations10. Relating an Illustration to the Discussion11. Transcoding

B	<p>(Continued)</p> <ol style="list-style-type: none">12. Challenging the Reader's Predicted Ideas and Reactions13. Checking, Criticising and Evaluating One's Own Information14. Minimising Weakness and/or Rectifying Mistakes15. Listening Results16. Pointing Out Problematic Areas17. Repeating and/or Recognising Information for Summarising Purposes														
C	<p>The Specific Rhetorical Functions Employed to Develop the General Functions of Level B</p> <p>Examples:</p> <table border="0"><tr><td>1. Definition</td><td>8. Arguing</td></tr><tr><td>2. Hypothesising</td><td>9. Criticism</td></tr><tr><td>3. Classification</td><td>10. Scanning</td></tr><tr><td>4. Description</td><td>11. Organisation</td></tr><tr><td>5. Listing</td><td>12. Evaluation and Assessment</td></tr><tr><td>6. Analysis</td><td>13. Summarising</td></tr><tr><td>7. Prediction</td><td>14. Suggestion</td></tr></table>	1. Definition	8. Arguing	2. Hypothesising	9. Criticism	3. Classification	10. Scanning	4. Description	11. Organisation	5. Listing	12. Evaluation and Assessment	6. Analysis	13. Summarising	7. Prediction	14. Suggestion
1. Definition	8. Arguing														
2. Hypothesising	9. Criticism														
3. Classification	10. Scanning														
4. Description	11. Organisation														
5. Listing	12. Evaluation and Assessment														
6. Analysis	13. Summarising														
7. Prediction	14. Suggestion														

Presumably, an effective EST material is that which would help students "be directed to look for the main idea in the text, to strive for global reading rather than word-by-word or even sentence-by-sentence reading" (Dubin and Olshtain, 1980:359). It would also motivate the students of science and technology

to simultaneously expand and reinforce their current knowledge in their field of specialisation (Fortune, 1979:45). Hitherto, emphasis on developing the abilities of language competence, reading skills and attitudes towards reading would be in the prime concern of a communicative EST reading skills course. In short, teaching efficient reading comprehension should emphasise both abilities: language competence and reading skills and styles.

In our handling of reading texts, we need to make a distinction between text-study as a means of developing language competence and the teaching of reading skills - a distinction that the traditional reading lesson has had some difficulty in making (Swales, 1980:123).

Given that understanding of science materials and study skills embodied in students' textbooks and other materials relative to their field of specialisation is a paramount objective of teaching EST, I assume that it would be a plausible idea if EST teachers select now and then materials to use in classroom discourses from the respective students' science textbooks or from scientific journals and texts directly relative to materials students are required to grasp as part of their curriculum syllabus rather than from materials dealing with general science topics which they would have already been acquainted with from

their pre-university education. Such a procedure would help provide teachers with science discourses directly germane to the students' needs and expectations, provide students with scientific knowledge directly relative to their field of specialisation and help them understand and perform in a better way study skills they are required to grasp.

In the communicative approach to reading, ... the student is first of all given a reason for reading. The most cogent reason for wanting to read anything is that the writer conveys - or is expected to convey - something which will be of use to the reader ('use' here being defined to include utilitarian as well as affective purposes (White, 1981:89)).

This implies that a good text is one which presents to the reader information which would challenge him to continue reading the text.

Additionally, dealing with topics selected from students' field of study would provide opportunities for both the EST teacher and subject teacher to discuss materials of a directly common interest. This would lead, in the long run, to forming a common ground which may help in assessing and developing EST programmes in non-native universities where joint efforts would be far better than unilateral ones.

It is worth mentioning, however, that the EST teacher should not try to take the place of the specialist, and he should always bear in mind that he is a language specialist and that his duty is to help his students to deal appropriately with science materials pertinent to their field of specialisation. Corollary to this assumption, the EST teacher should be more concerned with the language material of the text rather than with the subject matter when dealing with classroom discourse extracted from the students' textbooks, as his basic aim would not be teaching the subject matter of the text as such, but teaching that text as an example of scientific discourse whereby students would be trained to deal with similar discourses when they come to deal with science materials relative to their field of specialisation.

However, the afore-mentioned argument, albeit forms a guide, should not rule out the assumption that an effective EST material is one which is based on a true assessment and evaluation of the respective students' needs and expectations. Finally, it is consensus in ESP teaching that a good ESP course should be based on actually observed difficulties in the specific required skills of the students, not on preconceived ideas of what the students should know about the target language.

3.8.4 The Problem of Authenticity

Basically, the reading material presented for the development of reading skills would be written in a way which would help students read authentically. This material should gain the interest of the student and be appropriate to his linguistic level (Widdowson, 1978:91). The material should also attempt to facilitate the reading comprehension activity of the EST student and aid in transferring the skills he would have mastered in his vernacular to the requirements of English (Statman, 1981:232).

Actually, the objective of the EST course from dealing with a reading text is not exactly to understand a particular text, though that could be one aim of many, but to help students use a textual analysis of that material as a basis for attaining more abilities whereby reading and understanding texts of similar kinds would be easier and attainable.

Since the ultimate goal of the EST course is to help students deal adequately with genuine scientific materials and scientific journals written originally for native speakers of English, foreign EST students at university level would best be trained to deal with authentic texts as contrived texts would change the original message which the native speaker/writer attempts to convey to the listener/reader (Wood, 1982:134). Widdowson (1978:88) has also pointed out that simplification of an original scientific text would affect the sense to be conveyed via that text.

Presumably, simplified versions which are derived by lexical and syntactic substitution from genuine instances of discourse would deprive L2 learners of the opportunity to develop an interpreting strategy, as students would often discover values of various expressions in the process of interpreting a reading text. On the other hand, L2 learners might encounter difficulties in original texts because such texts would presuppose communicative competence which would depend on abilities relative to linguistic skills and a certain level of comprehension and comprehending processes which those learners might not possess. This would lead such learners to resort to a dictionary or certain glossaries which would direct students' attention to dealing with the text as a language learning exercise; a process which would reduce the possibility of establishing authentic response in L2 readers.

Widdowson (Ibid:89), however, has suggested a solution to this dilemma by presenting a third kind of text which he calls a 'simple account'. In such a text simplifying use rather than usage is the main objective of the process. Therefore, this 'simple account' represents a new text whereby recasting of knowledge derived from one source or another to be appropriate for a certain kind of reader would be achieved. Such a process would, in effect, involve reformulation of propositional and illocutionary development. In this context a 'simple account' would

not be an alternative textualisation of a given discourse, but a genuine instance of discourse designed to meet the needs of a certain kind of reader, whereby a certain communicative purpose would be attained.

It seems to me that a good example of Widdowson's 'simple account' above would be a text prepared by recasting of scientific information from original scientific materials into a simplified text of scientific materials, say a journal, which would be designed to meet in a balanced way the demands of both specialist and non-specialist native readers, and written with no teaching purpose in mind.

However, I assume that Widdowson's major problem in defining his 'simple account' above is his treatment of language as if language use and language usage were two separate entities which could be handled separately. It is axiomatic that use and usage in practical terms are inseparable entities, i.e. they constitute two sides of one paper, so to speak, - to tear one will definitely lead to affect the other. Therefore, recasting of information to produce a new discourse would involve both use and usage.

As far as authenticity is concerned, a 'simple account' in Widdowson's terms is an 'authentic text' and there is no doubt about it as far as I am concerned. But pedagogically speaking, an authentic text employed in the L2 teaching/learning process would have a pedagogical purpose. Therefore such a text should have a

certain linguistic and rhetorical level as well as educational appropriateness which would meet the demands of the classroom - students, teachers, curriculum, etc.

As far as simplified materials are concerned, it is to be noted that texts should not be too simplified so that students do not find them challenging, as such too-simple texts would be less productive with advanced students because it would lead to weakening of the interaction between the reader and the text as meaning should not be something ready-made to be delivered by the text as such. The advanced students should be left to look for a full meaning potential of the text without being encircled with the meaning imposed, by the simplifier (Bhatia, 1983:45).

Therefore, an authentic text used for teaching purposes would, in the first place, attempt to bridge the gap between students' current and target levels in both their knowledge in their special study and their performance in the target language. Such a text would have genuine information to disclose to the students as well as a certain rhetorical and linguistic difficulty which would act as a challenge to the EST students to continue reading the text. This would imply that a fourth kind of text would come into focus which I call "A Pedagogically Linked Authentic Text (henceforth, PLAT). In such a kind of text which should be prepared not for students with predicted needs and

difficulties in both knowledge of their field of specialisation and their predicted level of performance in the target language, but on practically assessed and evaluated needs and expectations of the foreign learners which are, in some way or another, linked to the demands of the curriculum and the requirements of the respective country.

In reading, we are beginning to see ESP material which consistently prescribes a purpose for the reader/student which is clearly distinct from the assumed purpose of the target reader, and thus leads to practice in reconciling the two readers (Sinclair, 1980:260).

Hitherto, PLAT would have similar properties reflected in Widdowson's 'simple account'. But it would serve a pedagogical purpose whereby certain glosses-vocabulary, logico-grammatical words, rhetorical expressions, reference to non-verbal modes, etc. which would be either above or below the lexical, linguistic and/or rhetorical difficulty of the corresponding items are to be interspersed throughout the text and between brackets directly after corresponding items. Such a text would avert distortion of message which a 'simplified version' might cause, as well as the difficulty of both subject matter and language material which an original text might have. It would also lead to unobtrusive learning pertinent to the students' special studies. Consider the pieces of discourse in (A) and their corresponding ones in (B) below which represent authentic discourses and tentative 'PLAT'

ones respectively. (Appropriate for students of dentistry. Extracted from Doctor's Answers, No. 30 Marshal Cavendish Ltd. London, 1981, pp. 811-12).

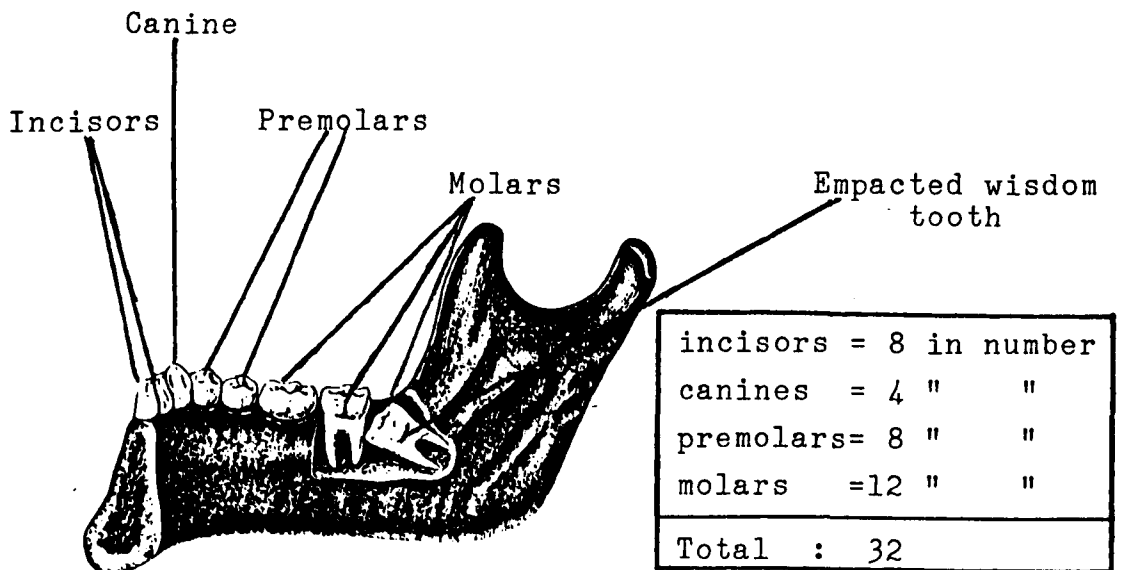
(A) Authentic Discourse

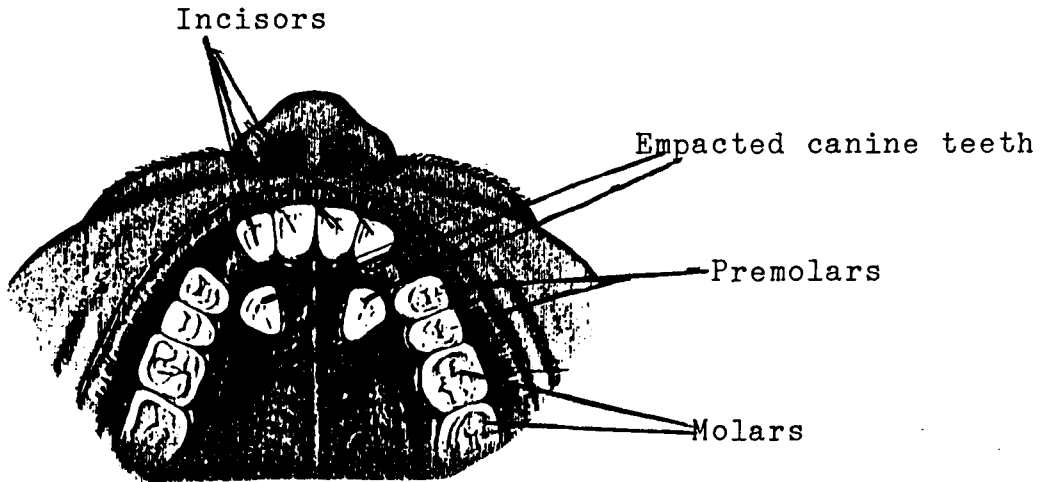
- i. The eruption of teeth into the mouth is not fully understood, but it is probably the result of rapid multiplication of the cells which form the tooth, the pressure of which thrusts the tooth through the overlying bone.
- ii. Impactions are comparatively uncommon in milk teeth because, as they are small, crowding is usually less.
- iii. It is possible for any permanent tooth to become impacted, but impaction due to overcrowding most often affects wisdom teeth, canines and premolars.
- iv. Impactions which are due to tooth development in incorrect positions affect upper canines more commonly than any other teeth, and the problem often runs in families, showing that it is inherited.

(B) Pedagogically Linked Authentic Discourse

- i. The eruption (emergence)⁽⁴⁾ of teeth into the mouth is not fully understood, but it is probably the result of rapid multiplication (proliferation)⁽⁵⁾ of the cells which form the tooth root, the pressure of which (whose pressure)⁽⁶⁾ thrusts the tooth through the overlying bone.

- ii. Impactions are comparatively uncommon in milk teeth (deciduous dentition)⁽⁷⁾ because, as they are small, crowding is usually less.
- iii. It is possible for any permanent tooth to become impacted, but impaction due to (caused by)⁽⁸⁾ overcrowding most often affects wisdom teeth (third molars)⁽⁹⁾, canines and premolars(situated in front of the molars)⁽¹⁰⁾ (see illustrations below)⁽¹¹⁾.
- iv. Impactions which are due to tooth development in incorrect positions affect upper canines more commonly than any other teeth, and the problem often runs in families, showing that it is inherited (that is, genetically caused)⁽¹²⁾





Illustrations Showing Impactions of Teeth

Given that science is being increasingly considered as a social activity which must be geared to serve human needs, our science materials would cover topics pertinent to development of the home environment and the community. Consequently, our authentic texts would be best selected from current scientific journals, so that information dealt with would be up-to-date. Such a procedure would help the EST teacher to be always in touch with the latest advances in science which would be of paramount significance for his classroom interaction.

Given that "total comprehension is an unrealistic initial objective" (Phillips and Shettlesworth, 1978: 26), authentic materials would remain capable of stimulating more realistic classroom discourse, albeit there is a possibility that the unrestricted nature of the linguistic content would lead to some difficulties in the classroom. However, there are several

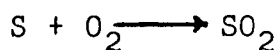
options which remain open to the teacher to capture this difficulty by presenting remedial work where necessary (Ibid:27).

It is worth mentioning at this stage that a good deal of scientific written discourse is reflected in paralinguistic conventions which include formulae, graphs, diagrams, maps, tables, charts and so on. Actually, the ability to read and interpret written discourse would require from the reader interpretation of such devices as well as embedded linguistic material, as both modes of communication would complement each other to form a coherent discourse (Widdowson, 1978:99). Therefore, a good EST text would attempt to train students to deal with both modes of communication. Thus students would make use of the homogenous facets of the scientific discourse whereby different modes of communication can be covered. This implies that scientific texts would lead students to focus on the process of textualisation of the text, i.e. to be aware how the discourse is functionally realised (Widdowson, 1979:57). For example, a text would train students to be aware that a scientific discourse would be realised verbally as in (a) below or by means of a symbolic system as in (b) or can be non-verbally represented as in (c) (Ibid:53-4).

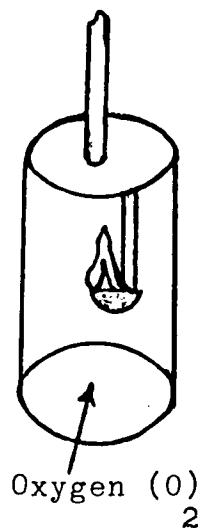
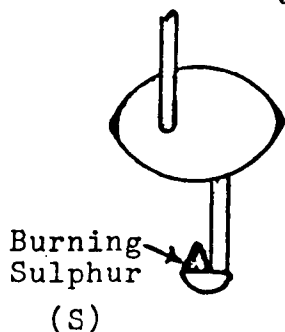
(a) Verbally

'Sulphur combines with oxygen to form sulphur dioxide'

(b) Symbolic System



(c) Non-verbal System



It is to be noted, finally, that overestimating aims could be counterproductive. This indicates that the course designer would be aware of the disparity which would arise between the pedagogical objectives behind designing and specialised EST course and the requirements of the subject matter which the nature of the specialised curriculum requires (Phillips and Shettlesworth, 1978:24). Hitherto, the course designer's job in this context would be to attempt to minimise that disparity, if there is any, in favour of students' needs and aspirations. Thus the language skills and study skills to be possessed by the students should determine what and how to teach in any EST course.

3.9 Application of EST Reading Skills

3.9.1 Encouraging Purposeful Reading

Given that there are different reading purposes and different reading skills would be involved in each purpose, the teaching of effective reading advocates development of reading skills whereby various styles of reading texts could be switched (White, 1981:88). Such reading styles or strategies would, in effect, be achieved through practice, as what the reader already knows is a crucial component for interpreting, evaluating and anticipating the text.

... reading is not simply a matter of correlating words as they occur in context with their dictionary signification but of creating value by the process of active interpreting (Widdowson, 1978:85).

Presumably, one of the effective ways for developing reading skills is when students are engaged in 'seeking information' exercises whereby students would be unaware that they are participating in a reading exercise (Shuman, 1982:728). This implies that a good EST exercise would help a student retain the overall message of the text within his mind rather than confining himself to a single low-gear, word-by-word reading strategy which would lead him to approach new texts with small chunks and within a limited decoding ability.

It is worth mentioning that the EST teacher would encourage students to read more books and journals relative to their field of specialisation at home, and practise study skills pertinent to reading comprehension such as note-making and essay-writing, as it is assumed that reading and practising at school would be "boring and often associated with fear and failure" (Ingham, 1982:54). Presumably, guiding EST students unobtrusively to come to terms with reading science books and journals with interest at home would be paramount in enhancing the reading skills of EST students in a non-English milieu.

Generally speaking, guiding students to be good readers would also be affected by the social life in a certain country. Hence, in order to attract students to reading activities in the Arab world, for example, the reading materials should be immediately and intrinsically attractive enough to make people in this society withdraw from other traditional and social activities which embody the Arab Society (Swales, 1980 :129).

Reading EST exercises would have to help students to be able to deal with textual analysis of materials relative to their field of specialisation, and understand the text as fully as possible. On the other hand, the teacher should be aware of his students' intellectual, cultural, syntactic and lexical competence so that he would be able to guide them towards

a full understanding of the texts by, for instance, supplying them with key words and expressions or questions he may ask in relation to the reading text. Those learning aids would pave the way for students to put themselves on the right route so as not to misunderstand the main point of the text.

Statman (1981:232) suggests a pedagogical technique called 'Semantic Memory' or 'Pre-text Activity' whereby students would be prepared to deal with the reading text through leading questions which precede the text. This technique is intended as a 'consciousness-raising' device whereby students would come to the text with a prior knowledge, and reading to them would be a kind of testing-out of prediction. The teacher should see, however, that the pre-text activity should not be so much emphasised that reading the text becomes secondary.

Given that the reading skill involves constantly varied purposes, therefore, questions to develop and assess the reading skill would also be varied according to the purpose in reading a certain text. By doing this, we would help students develop reading strategies adapted to the true purpose of their reading. Therefore, exercises of the following types would be developed (Grellet, 1981:5):

(A) To clarify the organisation of the passage

The questions can be about:

i. the function of the passage,

- ii. the general organisation (e.g. argumentative),
- iii. the rhetorical organisation (e.g. contrast, comparison)
- iv. the cohesive devices (e.g. link-words)
- v. the intrasentential relations (e.g. derivation, morphology, hoponymy).

(B) To clarify the contents of the passage

The questions can be about:

- i. plain fact (direct reference),
- ii. implied fact (inference)
- iii. deduced meaning (supposition)
- iv. evaluation.

Thus question-types which range from easily dealt with cloze-procedure exercises to exercises which require more creative responses through integration of diverse communicative language skills on the part of the learner would be crucial to developing efficient reading strategies.

3.9.2 EST Communicative Reading Exercises

The following are the most common communicative reading exercises which would be pertinent to the development of EST reading skills in non-native learners of scientific English (see Mountford, 1975; Maclean, 1975; Munby, 1978; Widdowson, 1978; Mackay et al, 1979; Morrow, 1980; Carroll, 1980; White, 1981; Grellet, 1981; Candlin, 1981; Nuttall, 1982; Adkins and McKean, 1983).

3.9.2.1 Sensitising or Inferring Meaning Exercise

Sensitising means getting the meaning of unknown elements by the help of other clues found in the text. These elements could be unknown words, language structures, logical and cultural elements reflected in the text. It is recommended that students should be encouraged to make a guess at the meaning of unknown words by the help of other language clues in the text without resorting to the dictionary (Grellet, 1981:14). Therefore, the skill of inference is of paramount significance to be developed in the foreign EST student at the university level; he would be discouraged at the early stages of the course when he finds himself stumble on every difficult word or phrase in a text. Thus emphasis in EST exercises would be placed upon practising inference through the context. Here are some exercises:

3.9.2.1.1 Guessing the meaning of words through contextual clues

Read the following text and point out the meaning of the word "thermal" by ticking (✓) the correct square below. (This exercise would be appropriate for students of Geology. The text is extracted from: Baven, Robert (1981) "Energy from the Earth: the Geothermal Option" in Science Progress, vol. 67, No. 265, Spring, 1981, pp.69-108 - p. 69).

Energy from the Earth: the Geothermal Option

The crust of the earth contains a vast, irregularly distributed quantity of heat energy generated mainly as a result of the decay of radioactive elements and causing temperatures to increase with depth so that there is a net flow towards the planetary surface at which heat dissipation takes place. This natural heat source constitutes geothermal energy and it is available concentrated in subterranean reservoirs normally as steam, hot water and/or hot rock. The earth's temperature exceeds 100°C at 10 km depth and sometimes exceeds 300°C at only half this depth, the thermal energy stored at the former depth probably amounting to around 3×10^{23} calories equivalent to 3.5×10^{20} kWh, i.e. the heat content of 4.5×10^{16} short tons of coal. Clearly, the total thermal energy so accumulated exceeds by orders of magnitude that available from all of the nuclear and fossil fuel resources of the planet, the only comparable alternative source being solar energy.

- "Thermal" means
- pertaining to electricity
 - pertaining to heat
 - pertaining to water
 - pertaining to oil (13)

3.9.2.1.2 Providing Missing Words in a Cloze

Exercise

In the following text, several words have been taken out. Read the text carefully and then try to

supply the missing words. (This exercise would be appropriate for students of Physics. Extracted from: Morrow, Keith (1980) Skills for Reading. With Extracts from New Scientist. O.U.P. Hong Kong. p.73).

The Birth of Stars

So far as we know, most of the matter in the is in the form of stars. The majority of stars, including ... sun, are clouds of gas which are maintained at a high by the energy liberated by thermonuclear reactions in their centres. of our knowledge of stars and how they evolve comes from ... study of the visible light they emit. The birth of stars,, cannot be followed by an optical telescope, since it takes place regions of space from which light cannot escape. To study process, therefore, astronomers have to make use of telescopes operating at otherThe recent technical developments in radio, millimetre-wave and infra-red have turned the study of star-formation into one of the exciting areas of astronomy.

The birth of a star is a, slow event; all but a very few of the stars visible the naked eye have existed longer than mankind. We must therefore consider the evidence that new stars are now being formed at

The energy which a normal, so-called 'main sequence' star radiates into space generated by the conversion of hydrogen to helium. If we compare

the of hydrogen 'fuel' in a main sequence star with the rate at energy is being emitted we can estimate its potential lifetime. is found that the main sequence lifetime of a star depends on its mass; low mass stars are small, cool and long-lived, high mass stars are large, hot and short-lived. Our sun is half-way through its total main sequence lifetime of 10^{10} years, but a with a mass thirty times greater than the Sun would live only a few million years. The fact that such bright stars are to exist now implies that star formation must have taken over the past few million years; since our Galaxy is ten thousand million years old, it is therefore reasonable to assume somewhere in the galaxy the same process is taking place now. Moreover, the fact that these hot bright stars are almost always in the vicinity of interstellar gas clouds leads us to conclude it is out of such clouds that new stars condense.

(Deletion ratio is nearly every 12th word of the text).

3.9.2.1.3 Word Inferring Exercise

The aim of this exercise is to help students to understand unfamiliar lexical items through understanding the function of affixation in words and the way words are formed and derived. Through the help of suffixes and prefixes as they are encountered in

various contexts, students would guess the meaning of a great number of unfamiliar words by the help of other contextual clues in the passage. Consider the following exercise:

Guess the meaning of each of the underlined suffixes and prefixes in the following text. (Appropriate for students of medicine. Extracted from Doctor's Answers No. 77, 1982, Marshall Cavendish Ltd. p.2127).

Allergic Rhinitis

Sneezing is also part of an abnormal reaction to an inhaled substance or allergen, so-called because it is allergy-producing. The commonest allergens are the grass and tree pollens which are responsible for hay fever, and the droppings of the house-dust mite, a normal inhabitant of most houses which may cause many allergic problems.

In a sensitive person antibodies are already attached to certain cells in the nasal mucosa called mast cells. When the allergen enters, the antibodies fuse with them and in so doing upset the structure of the mast cells. These then fall apart and release histamine - which is highly irritant and produces the inflammatory response.

Patients are overcome by bouts of violent sneezing, and have a profuse watery discharge and nasal obstruction. Treatment involves identification of the particular allergen so that it can be avoided or at least reduced as far as possible. This is done by skin testing.

Three types of drug are also in use which control the patient's nasal symptoms. Antihistamines act by blocking the effect of histamine on surrounding cells. Disodium cromoglycate, taken as a spray or in drops, prevents the release of histamine from the mast cells, but only if taken in advance of an attack. Topical steroids work by suppressing the inflammatory reaction triggered by histamine release. Their activity is confined solely to the nose and they are therefore totally safe. Where no medicine is at all effective, desensitising injections may be needed.

3.9.2.2 Contextual Reference Exercises

The aim of this exercise is to train students to participate in the reasoning process which is required in interpreting a text (Widdowson, 1978:107). A contextual reference exercise would deal with value of anaphoric/cataphoric elements or connectives or re-phrasing activities.

3.9.2.2.1 Anaphoric/Cataphoric Exercise

This exercise aims to help students to be aware of the relations between parts of a text through reference. Understanding anaphoric and cataphoric links such as: this, that, it, his, one, etc. and their reference in a text would be paramount for foreign EST learners, as much of the text comprehension depends on their understanding. Such expressions would require the reader to go back for information from previous parts in the text (Mountford, 1975:150). Consider the following exercise:

Point out what the underlined words refer to in the following text. (Appropriate for students of biology. After Grellet, 1981:46).

Evolution

The idea of evolution which is gradual change was not a new one. The Greeks had thought of it, so had Erasmus Darwin, the grandfather of Charles, and also the Frenchman, Lamarck. It is one thing to have an idea; we can all of us guess and sometimes make a lucky guess.

It is quite another thing to produce a proof of the correctness of that idea. Darwin thought he had that proof in his notebook. He saw that all animals had a struggle to survive. Those which were best at surviving their environment passed on the good qualities which had helped them to their descendants. This was called 'the survival of the fittest'. For example, in a cold climate, those who have the warmest fur will live. Darwin believed that this necessity for an animal to deal with its environment explained the immense variety of creatures.

3.9.2.2.2 Rephrasing Exercise

In this kind of exercise, students are required to practise the realisation of synonymous expressions in contexts. Consider the following exercise:

Rewrite the following text by replacing the underlined words with expressions which have the same contextual meaning. (Appropriate for students of

pharmacology and veterinary studies. Extracted from: Doctor's Answers, No. 77 Marshall Cavendish Ltd. 1982 p.2125).

Anti-snakebite serum

This development of anti-snakebite serum - anti-venom - which can be injected intravenously or intramuscularly has made treating snakebite much easier than it used to be - providing that the serum is administered in reasonable time. Serums are made by injecting animals with small amounts of venom until they build up antibodies to the poison. Thus the serum derived from their blood will contain these antibodies and can be used to combat the effects of the bite in human beings. However, since antivenoms are blood from a foreign species, they are likely to cause a reaction in the host and other drugs need to be given to cover the injection - adrenalin or steroids, for example. Because of this danger of reaction, doctors try to use serum with discretion.

Almost inevitably, however, there will be a time-gap between the snakebite and administering any necessary antivenom.

3.9.2.2.3 Connectives exercise

Connectives cover link-words such as: because, although, for instance, on the contrary, if, however, likewise, thus, in spite of, then, and, when, that, how, but, so, therefore, yet, actually, etc. Mastering the

use of such connectives would help students when dealing with essay-writing. Consider the following exercise.

Read the following text carefully and try to add link-words where necessary from the list below. Some of these link-words may be used more than once. (Appropriate for students of Chemistry. Extracted from: Otto, 1979:321).

Chemical Formulas and Equations

Today we're going to talk about chemical equation. We will look at chemical equations describe chemical reactions. Most reactions are complicated, a chemist will write them down in the form of an equation.

....., let's write the equation, $2\text{H}_2 + \text{O}_2 = 2\text{H}_2\text{O}$ a chemical equation is like a mathematical equation, both sides of the equation must balance. understand this better, we will look at another chemical equation sodium is dropped into water, it will react violently. The equation for this is the following: $\text{Na} + \text{H}_2\text{O} = \text{NaOH} + \text{H}_2$.

....., this equation does not balance,, the two sides are not equal balanced, the equation will be the following: $2\text{Na} + 2\text{H}_2\text{O} = 2\text{NaOH} + \text{H}_2$.

3.9.2.3 Truth Statement Exercises

In this kind of exercise the reader is presented with statements whose truth he is required to assess against the information he has derived from the text.

Thus the activity involved in such questions is a psychological one whereby the reader would measure the truth of given propositions against knowledge. Examples of truth assessment exercises are True/False or tick/cross (\checkmark / \times) exercises, and multiple choice exercises. A True/False exercise would be more appropriate for EST students if students are required to re-state the incorrect responses rather than to merely tick or cross the responses.

Presumably, multiple choice questions would be of crucial value if they were prepared in such a way as to emphasise the functional properties of language rather than the formal ones. Therefore, it would be more effective for students to be trained to answer multiple choice exercises from their memory after a careful reading of the text, i.e. students would be asked to put the text aside when they deal with the questions. Consider the following exercise:

Read the following text carefully, then try to choose the correct answer using your memory. Don't go back to the text once you start answering the questions, please. Circle the letter in front of your answer. (Appropriate for students of electronic engineering).
After Otto, 1979:326.

Forces

Today I think it would be good for us to talk about one aspect of particle dynamics which is very much at the centre of this subject. I would like to

talk about the different forces that exist in nature.

But before I go into these different forces, let me review the basic terms. First, I think that you know that dynamics is the science of motion, and more specifically, it's the science of why things move in certain ways. So particle dynamics talks about the causes of the motion of particles.

Now what are the different kinds of forces which can have an effect on particles? Well, there are four major categories of forces, and we'll talk about them in order, from the weakest to the strongest. Strangely enough, this is almost the opposite of the sequence of range or distance of effect. What this means is that the strongest force has the shortest range and the weakest force has the longest range. Very strange, isn't it? And no-one knows why.

The weakest force in the universe is - does anyone know? - gravity. Yes, gravity is very weak, but it has a very great range and acts on every kind of particle which has mass. In addition, it is the kind of force which is always attractive, which means that it always pulls things together and never pushes them apart from each other.

Well, what comes after gravity? The second weakest force in the universe is what is known as the "weak force". It is not as weak as gravity, but its range is extremely short. By short, I mean that it only has effect at distances smaller than the size of

an atom. And instead of affecting any kind of particle, like gravity does, the weak force affects only electrons and neutrons. Again, different from gravity, the weak force repels these particles; it never attracts or has any other than one of repulsion.

The third kind of force we're going to talk about today is familiar to all of you. It is electromagnetic force. This includes all kinds of electrical and magnetic forces which were shown, by Maxwell, to be the same kind of force. As you know, the range of electromagnetic forces is very long, though not as long as gravity. Unlike gravity and the weak force, however, they are fairly strong and they act on any electrically charged particles. Electromagnetic forces can either attract or repel. I should also add that they are sometimes seen as a form of matter known as photons.

Let us now turn to the fourth and strongest type of force, which physicists call the "strong force". Where does this occur? Well, you can only find the strong force in the centre of the atom, in the nucleus. And it only affects particles which are found in the nucleus. But this doesn't keep it from being the strongest in nature. If we compare it to the force of gravity, it is about 10^{39} times stronger! This number is 1 followed by 39 zeros, so you can see how much stronger the strong force is than gravity.

After looking at these four forces, you may ask yourself why there are so many different forces. For

now, no-one knows, but finding out about the relation between these forces is one of the biggest problems in modern physics.

Now, circle the correct answer.

1. Particle dynamics and the different forces are related
 - a. only in the laboratory
 - b. in all sciences
 - c. only in bodies like particles
 - d. very greatly in physics

2. The meaning of 'dynamics' is the following:
 - a. the science of the reasons for things moving
 - b. special forces of motion
 - c. the science of forces
 - d. the types of motion in particles

3. In the lecture, the forces are presented
 - a. in order of range of effect
 - b. in order of particles affected
 - c. in order of strength
 - d. in order of strangeness

4. The text states that the relation of range to force is strange because
 - a. they are so close to each other
 - b. they are almost opposite to each other
 - c. they never change
 - d. they are not understood

5. The properties of gravity are that
 - a. it attracts only and acts over a large range
 - b. it repels only and acts over great distances
 - c. it only attracts over short distances
 - d. it affects all particles only over large distances.

6. The range of the weak force is
 - a. the same as that of gravity
 - b. only inside the atom
 - c. limited by its forces
 - d. much greater than other forces

7. Electromagnetic forces are different from gravity because
 - a. they only repel and gravity attracts
 - b. they are stronger and have a larger range
 - c. they can affect any kind of particle
 - d. they have a shorter range and are stronger

8. The 'strong force' is
 - a. slightly stronger than gravity
 - b. a major force between stars
 - c. 10^{39} times more powerful than the "weak force"
 - d. the strongest and most limited force

9. The exact relation between these four forces is
 - a. not well understood
 - b. of little interest to particle dynamics
 - c. not useful to know
 - d. already well-known

10. A good title for this lecture would be the following:

- a. Strong and Weak Forces
- b. Ranges of Forces in Nature
- c. The Relation between Forces
- d. Four Forces in Particle Dynamics

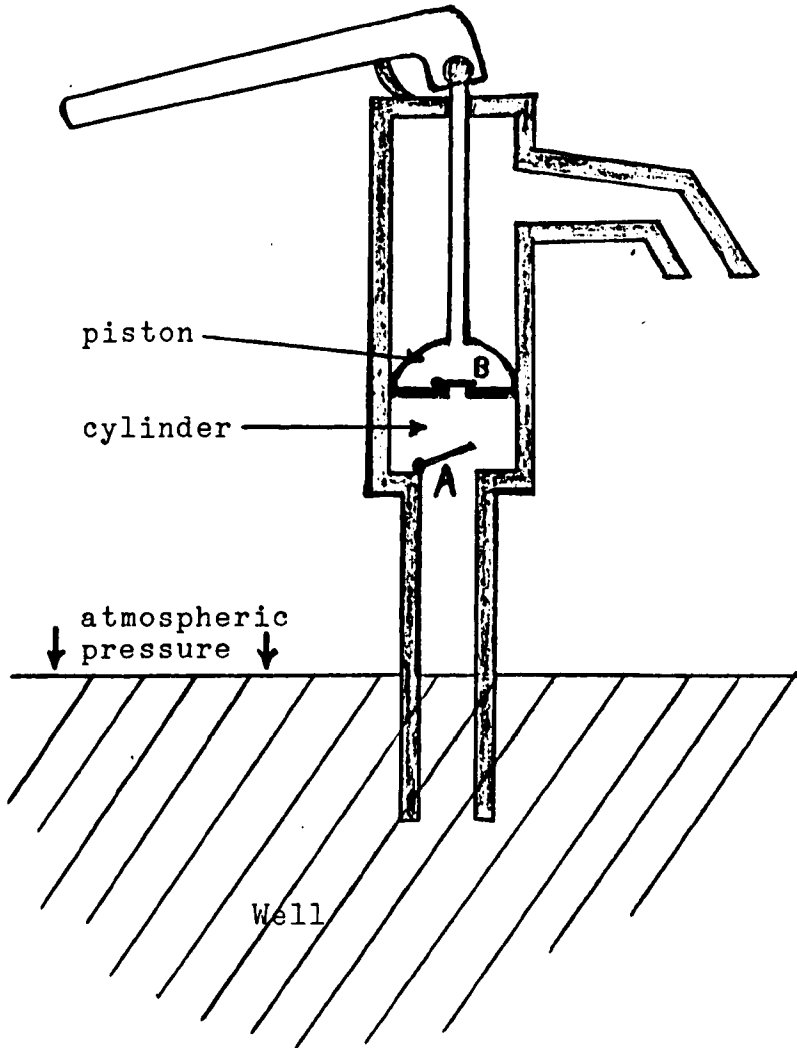
3.9.2.4 Transcoding Exercises

The purpose of this exercise is to train students to change a visual information into a verbal one or vice versa. Transcoding information into figures would also be included in such an exercise. Transcoding exercises would require students to complete a graph or a diagram or summarise verbal information in tables on the basis of their understanding of a certain discourse. Such exercises can involve quite short pieces of texts concerning estimates, calculations, diagnosis of diseases, advice on procedures, proposals for action, data classified and summaries made.

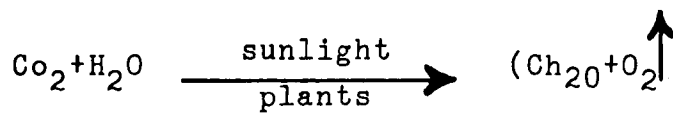
Through these exercises integrating speaking, listening skills and note-making could be achieved. These exercises, therefore, aim at eliciting natural responses whereby students would be helped to check their understanding against their ability to carry out instructions embodied in the exercise (Widdowson, 1978:99). Consider the following exercises:

(a) Look at the following diagram of a lift pump.

Try to describe the process of raising water from a well (Appropriate for students of mechanics. Extracted from Dudley-Evans, et al, 1976:194).



- (b) Express the following equations concerning the process of photosynthesis in words (Appropriate for students of Botany. After Mountford, 1975: 229).



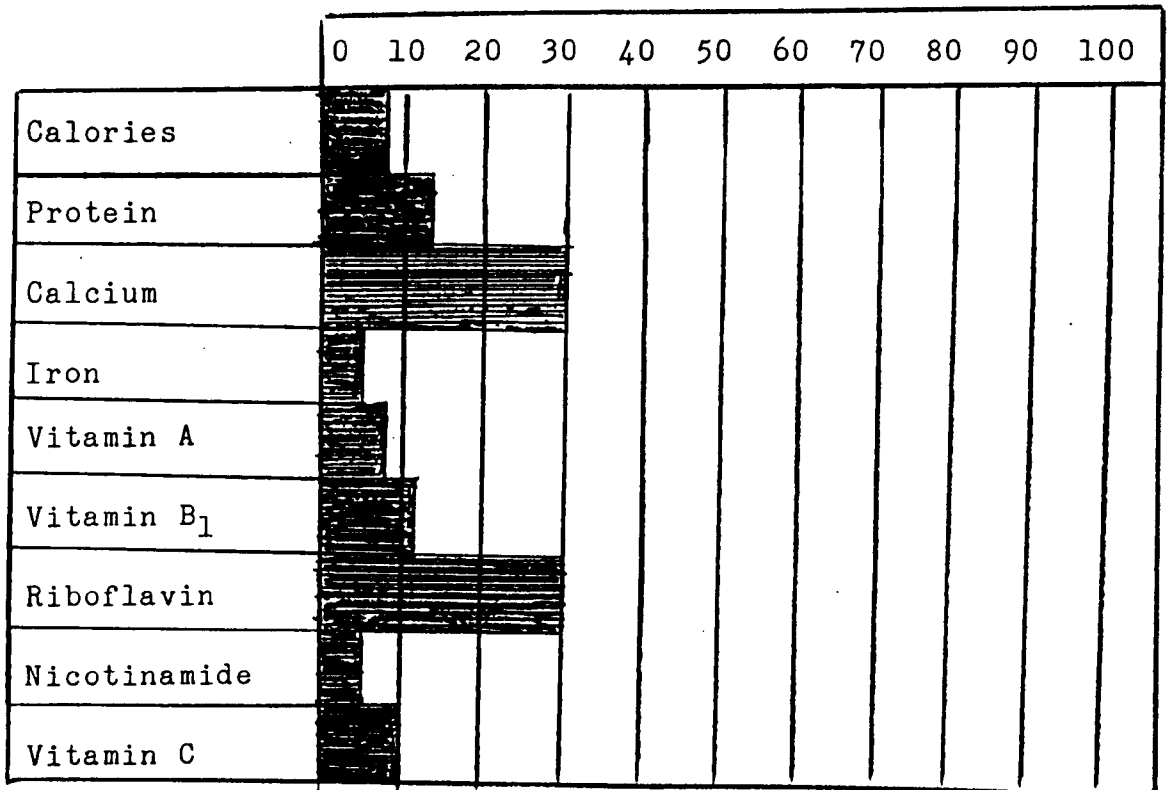
- (c) Read the following text and draw an appropriate graph which would convey the meaning in the text. (Appropriate for students of civil engineering. Extracted from Alexander, R. (1981) "Factors of Safety in the Structure of Animals" in Science Progress, Vol.67, No. 205, Spring, 1981 p.109).

Factor of Safety

'Factor of Safety' is a term used in engineering. The factor of safety of a structure or component is the ratio of the load which would cause it to fail, to the maximum load it is required to withstand. For instance, a component required to take a load of 10 kN may be made of a thickness calculated to break under a load of 20 kN, giving a factor of safety of 2. Minimum factors of safety for engineering structures are specified by codes of practice. Typical values are 1.7 - 2.05 for steel buildings and bridges, 6 for wooden structures and up to 11.25 for the wire ropes of passenger lifts.

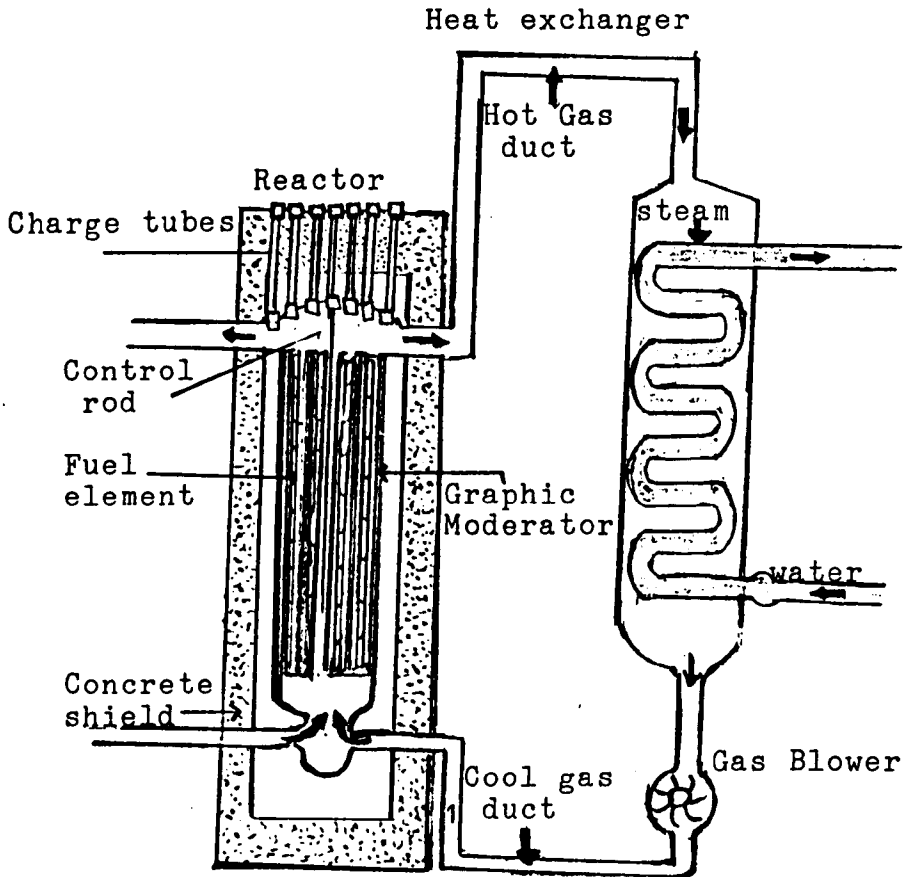
Factors of safety are often justified statistically. Consider a component which is required to support an expected maximum load \bar{L} and is designed to have strength \bar{S} , so that the factor of safety is \bar{S}/\bar{L} . There may be some uncertainty about the maximum load so that the actual maximum load L has a probability distribution of standard deviation of about the estimate \bar{L} . Similarly, there may be variations in the strengths of similar components, so that the actual strength S is distributed with standard deviation a_s about the calculated value \bar{S} . The designer's problem is to choose \bar{S} so that the probability that S is greater than L has some suitably high value. If a_s and a_L are known, the required factor of safety can be calculated. If they are not, rules of thumb based on experience must be used.

(d) Study the following graph to write a paragraph describing the percentage of daily requirements contained in a half pint of milk. (Appropriate for students of nursing profession. Extracted from Maclean, Joan (1975) English in Medical Science. English in Focus. O.U.P. London p.23).



(e) Assume that you are writing the methods and materials section for a researcher report. Your report is about an improved electric water heater which you have designed to conserve energy. Study the illustration below, then write the text for your report. (Appropriate for students of electrical engineering. Extracted from a booklet published by the British Nuclear Fuels Limited, Energy for the Atom, 1982.

A. Illustration



B. Information

Nuclear power is now part of our everyday lives. The enormous energy of the atom has been safely harnessed to make electricity by using the heat which arises in the core of a nuclear reactor. In the reactor uranium atoms fission to give off energy in the form of heat. This is transferred via a coolant from the reactor to water boilers where steam is raised to drive turbo-alternators which produce electricity.

At the heart of a nuclear reactor is the uranium fuel from which energy is released. Nuclear fuel can take various forms and may remain in a reactor core producing power for up to nine years. It is then re-processed to extract unused uranium and valuable by-product plutonium and to remove, for safe storage, the radioactive waste fission products which have arisen during the fuel's time in the reactor.

3.9.2.5 Transitional Exercises

Transitional exercises aim at preparing students for the transition from simple to more complex kinds of discourses. Therefore, depending on the experience they get from dealing with transitional exercises, students would deal more adequately with larger stretches of discourse. Consider the following exercises:

3.9.2.5.1 Expressing Equations.

- (a) Study the following equations and ways of expressing them in words:



When water combines with carbon dioxide they form carbonic acid.

or

Carbonic acid is a compound which consists of water and carbon dioxide.

- (b) Now express the following equation, whereby zinc sulphate is formed and hydrogen is given off.



3.9.2.6 Text Manipulative Exercises

These exercises aim at training students to deal with discourse at the paragraph and text levels. Such exercises would cover the following communicative functions.

3.9.2.6.1 Note-Making Exercise

The main aim of this exercise is to train students to identify the main ideas of the text and extract salient points to condense them later on to a coherent text. The best way to train students to make notes of a text would be to help them practise looking for the main ideas in the text and underline them. Then they would be asked to write them down as separate notes. Consider the following exercise.

Read the following text carefully and try to write down the main ideas presented in it. (Appropriate for students of the nursing profession. Adapted with modification from a booklet issued by the Department of Health and Social Security and the Welsh Office, England).

Vaccination of Infants

Vaccines are among the safest and most effective medicines. Every year they prevent countless serious illnesses and many deaths from diphtheria, tetanus, whooping cough, poliomyelitis and other infections.

The vaccines against diphtheria , tetanus (lock-jaw) and whooping cough are usually combined into one 'triple' vaccine which gives good protection against all these diseases.

Diphtheria is a very serious infection which affects the nose and throat. There are medicines helpful in treating this disease, but vaccination will prevent it.

Tetanus is usually the result of an infection of wounds which may appear to be trivial. The disease which follows is severe and often fatal. Its common name is lock-jaw because of the muscle spasms which usually occur. Vaccination prevents it.

Whooping cough is a long and distressing chest infection which often damages the lungs. People of any age can become ill, but infants are most likely to have it seriously, and for them it can be fatal. It is a highly infectious disease particularly within a family and vaccination can prevent it.

However, the 'triple' vaccine sometimes produces fever in infants. It can also cause soreness, redness and swelling at the site of the injection. These reactions are usually mild and last only a short time.

It is to be noted that the 'triple' vaccine should not be given to children who have had fits or in whom there is a family history of epilepsy or certain other conditions.

Finally, poliomyelitis (polio) often causes permanent paralysis. Polio-vaccine prevents developing paralysis. This vaccine seldom produces harmful effects.

The following notes of the above text would be made:

- i. Vaccines prevent illnesses,
- ii: 'Triple' vaccine gives protection against diphtheria, tetanus and whooping cough.
- iii. Diphtheria affects the nose and throat,
- iv. Tetanus is the result of infection of wounds. This disease is often fatal.
- v. Whooping cough could damage the lungs, particularly in infants.
- vi. Vaccines, however, can cause reactions - soreness, redness and swelling, but these reactions are usually mild.
- vii. 'Triple' vaccine should not be given to children who have had fits or in whom there is a family history of epilepsy.
- viii. Poliovaccine prevents developing paralysis.

3.9.2.6.2 Summarising or Re-organising Information
Exercise

The aim of this exercise is to grasp the overall organisation of the text and extract the main ideas from it. Students would then be asked to condense the gleaned information from the text to a certain number of words. Consider the following exercise.

Read the following text carefully and underline the important ideas in it. Then write them down so as to form a coherent summary of about 100 words. (Appropriate for students of Biology. Extracted from Wyllie, T. and Morehouse, L. (eds)(1978) Mycotoxic Fungi, Mycotoxins, Mycotoxicoses. An Encyclopaedic Handbook. Vol. 3, Marcel Dekker, Inc. New York and Basel p.52).

Biological Properties of Toxic Fusarium Fungi

The distribution of Fusarium fungi of the Sporotrichiella section is fairly wide-spread in plants, soils and other substrates.

The remnants of vegetative parts of cereals in the field, grains which fall down at harvesting, and cereals which have been moved and heaped in the field and then wet by the rains, or harvested late in autumn after the rains have already started, all constitute a good medium for the development of fungi.

Since toxin may already be found in vegetative parts in the autumn, the danger exists that the grains of cereals harvested in the spring will also be toxic.

The toxin is not equally distributed in the grain. In prosomillet grains more toxin was found in the glumes than in the grain itself. It was also observed that there are light and heavy grains. By separating them with 10 to 25% NaCl solution, it was found that the light grains which floated in the solution were toxic, whereas the heavy grains were not

toxic or were less toxic. This observation led to the assumption that toxin does not invade the grain from without, but is produced within the grain. If the light and toxic grains are pressed slightly, they turn into powder, in contrast to the heavy non-toxic grains which cannot be easily ground. The powder derived from the grains infected with fungi contains the highest concentration of toxin.

The toxic fungus is believed to develop in the embryo of the grain and later the mycelium spreads through the whole grain. This is why the percentage of germination of overwintered grains infected with toxic fungi is much less than that of normal grains.

Climatic and ecological conditions are very important to the development of the fungus. If the winter is mild and temperatures not too low, the development of the *Fusarium* fungi is possible. The condition of the soil also influences the development of the fungus: the thicker the layer of snow, the less frozen the soil and the better the fungi develop. When the layer of snow is thinner and the soil freezes, fungi will not develop and toxin will not be produced.

Therefore a 100-word summary of the above text would be something like the following:

Grains, cereals fall down at harvesting or heaped in the field and wet by the rain constitute a good medium for the development of fungi. It is feared that the grains of cereals harvested in the spring will be toxic.

Since it was found that the light grain was toxic whereas the heavy grains were not toxic, or were less toxic, it is assumed that toxin is produced within the grain itself. The toxic fungus is believed to develop in the embryo of the grain and later the mycelium spread through the whole grain.

Temperature which is not too low as in the case of thick layer of snow would help the development of the fungi. When the layer of snow is thinner and the soil freezes, fungi will not develop and toxin will not be produced.

3.9.2.7 Translation Exercise

This kind of exercise would be of much use for students of medical science. The process of translation would lead students to grasp the content of the text as well as fixing the terminology in the students' minds. It could also be used as an information transfer exercise whereby scientific information which students already possess in their native language would be transferred into the target language.

Translation aims at making the learner aware of the communicative value of the language he is learning by overt reference to the communicative functioning of his own language (Widdowson, 1978:160).

Consider the following exercise (Appropriate for students of dentistry. Extracted from Doctor's Answers, No. 30, Marshall Cavendish Ltd. 1981 p.810).

Impacted Teeth

The eruption of teeth into the mouth is not fully understood, but it is probably the result of rapid multiplication of the cells which form the tooth root, the pressure of which thrusts the tooth through the overlying bone.

In case of impaction, the problem is not usually one of failure within the developing tooth itself, but either of its position or of its relation to the other teeth nearby. Where there is crowding, that is, inadequate space in the mouth for all the teeth, the last teeth to erupt often have insufficient room, because the space available has all been taken by the teeth which have already emerged. Under these circumstances, the later erupting teeth may grow through, but out of line, or alternatively, they may be unable to emerge fully. When a tooth fails to erupt, either fully or partially, it is described as being impacted.

The cause of the crowding which leads to most impactions is not really understood, but it may arise as the result of the patient inheriting large teeth from one parent and small jaws from the other. It has also been suggested that there may be an evolutionary process in progress leading to a reduction in the size of the human jaw.

Sometimes, teeth are impacted as a result of their being formed in the wrong position. For example, upper canine teeth are sometimes too deeply placed, so that when they begin to erupt, they grow towards the roof of the mouth, instead of towards the alveolar bone (bordering the gums). It is not usually possible for them to erupt.

Impactions are comparatively uncommon in the milk teeth (called the deciduous dentition) because, as they are small, crowding is usually less.

It is possible for any permanent tooth to become impacted, but impaction due to overcrowding most often affects wisdom teeth (third molars), canines and premolars. Impactions which are due to tooth development in incorrect positions affect upper canines more commonly than any other teeth, and the problem often runs in families, showing that it is inherited (that is, genetically caused).

3.9.2.8 Text Evaluation Exercise

This exercise deals with comparing several texts in order to evaluate information. It would also deal with assessing the writer's intentions in writing a text. Such an exercise in my opinion would be more applicable to literary texts than to science texts.

However, training students to deal with text assessment and evaluation would lead to the development of effective reading skills.

In dealing with this kind of exercise students would discriminate between facts and opinions, the writer's implied ideas would also be discussed and reacting to those ideas would also be exercised.

Scientific texts dealing with tentative theories on evolution, the formation of the solar system, the formation of mineral oil, the causes of cancer cells, etc. would be good examples to deal with. Consider the following exercise.

Read the following three texts about cancer causes and formation and try to answer the questions that follow. (Appropriate for students of medicine. Extracted with modification from Doctor's Answers, No. 10 Marshall Cavendish Ltd. London, 1981.p.261).

Causes of Cancer

Text A. The chemical theory

The chemical theory relies on the knowledge that certain chemicals - tar, for example - will cause cancer when painted on the skin of laboratory animals. It purports that environmental factors, such as chemical pollution and exposure to radiation are thought to lead to cancer. These chemicals are irritants that may alter a cell's genetic structure and turn it into a cancer cell. Large numbers of experiments have identified chemicals that will cause cancer in animals; these are called carcinogens. A certain number have been identified, the best known being

tobacco smoke. However, despite research, it has not yet been possible to identify carcinogens responsible for many of the common cancers.

Text B. The Viral Theory

The viral theory states that a cancer cell is infected by a virus (a tiny germ), and that it is this that causes the cell to grow.

Text C. The Immunological Theory

The immunological theory considers that abnormal cells are constantly being produced by the body, but that these are destroyed by the body's defences. For some unknown reason, this defence system breaks down and an abnormal cell survives to form a cancer.

Now, questions such as the following would be asked.

- i. Which of the texts about the causes and formation of cancer do you support most? Why? Can you give other ideas to support the points presented in it?
- ii. Compare and contrast the good points in any two of the above texts.
- iii. Which of the three texts, do you think, has the weakest claims about the growth of a cancer cell? Can you list its weak ideas?

Broadly speaking, the communicative exercises aim, in effect, to encourage students to explore a wide range of options in expressing themselves. This would help them to be less reluctant to express themselves in the target language which would in turn build some degree of confidence in their performance (Kameen, 1978:400).

It is to be noted that a good way for practising reading exercises whereby integration of various language skills would be involved is through group work activities, whereby students would be required to argue the information they arrived at in their group activities as group work would encourage active participation by students. The teacher in this case would go round the groups promoting discussion and giving help where necessary to guide the discussion on the right lines, so that it would lead to understanding of the text (Brumfit, 1980:8). Group work discussion would not only lead to a better understanding of a text, but it would also give L2 students a great feeling of confidence and intellectual achievement.

3.10 Assessing Reading Performance

3.10.1 Introductory Note

The restricted aim of this section deals with the diverse types of communicative reading tests which are available, and of their possible uses and limitations to science students. Some concepts related to the effective use and administration of the reading tests will also be discussed. Therefore, the emphasis

throughout the section will be on practical considerations which are central if testing is to make an effective contribution to the teaching of reading skills.

In fact, in any teaching/learning programme it would be difficult to separate testing from teaching, as each one seems to be prerequisite to the other. As Pumfrey (1977:7) puts it "Teaching and testing are complementary functions in efficient education. They cannot be divorced." Actually, teaching and testing might appear to be different activities on the surface, but down underneath they may share sameness of purpose.

Additionally, testing is an effective motivation for students' progress and skill learning as it would provide them with continuous feedback about the stages of success of their attempts in learning the target language (Upshur, 1975:53).

3.10.2 Reading Tests: Their Potentialities and Limitations

Tests are means of obtaining assessment data which are virtually of great value to the language teacher and material organiser.

Recently, emphasis on communicative language teaching has shifted emphasis from discrete-point tests to global tests. Some Examination Boards, however, still use discrete-point tests at the sentence and intra-sentential levels assuming that those tests would be economical, easy to administer, objective

and reliable, particularly in testing reading skills (McGrath, 1979:38) and oral comprehension (Upshur, 1975:59).

In fact, discrete-point tests have been placing heavy emphasis on the formal properties of language, i.e. emphasising language usage and paying very little attention to language use. From the 'usage' point of view, on which such tests are based, "language is seen as a unified entity with fixed grammatical patterns and a core of commonly-used lexical items" (Carroll, 1980:8). Therefore such a theory purports that mastering such patterns of language would equip L2 learners with language skills that would help them cope with language situations they find themselves in.

Heaton (1975a:90) purports, however, (see also Oller, 1979:226 and Carroll, 1980:8) that discrete-point tests are ineffective for testing communicative competence, as they aim at testing bits of the language, particularly language usage.

Connected chunks of discourse are recommended for testing purposes because they display certain properties of normal constraints on language use that cannot be expressed in disconnected sentences (Oller, 1979:299).

Actually, the tendency towards devising tests for assessing communicative performance has resulted, in essence, from current ideas about the role of language

in communication, in particular, by the implications of ideas relative to ESP teaching and testing rationale which is based on assumptions that the target language would be taught and tested according to the specified language needs of the learners. Hence, language loses its appearance of unity and would be looked upon as consisting of several repertoires, each of which would have its own functional properties. Hitherto, the teaching/learning process and testing procedures would be designed to meet such specified needs of particular learners.

However, tests would be considered practical and effective in ESP communicative pedagogy as far as they approximate to the communicative needs of the learner and lead to the shortest route to achieve that goal.

Basically, a well-organised test would shed more light on the following parameters in test construction as shown in diagram 26, which is cited by Carroll (1980:13).

- | | |
|----------------------|--------------------------------------|
| Phase 1: Design | (1) description of participant(s); |
| | (2) analysis of communicative needs; |
| | (3) specification of test content. |
| Phase 2: Development | (4) realisation of tests; |
| | (5) trial application; |
| | (6) validation and test analysis. |
| Phase 3: Operation | (7) full-scale application; |
| | (8) operational use; |
| | (9) revision of test system. |

Diagram 26

Test Construction Phases

Thus, as far as the EST programme is concerned, tests should be relevant to the specified learners' needs and provide sufficient and reliable data for the making of decisions and for the improvement of the test system itself.

Teachers would also be in need of an adequate training in ESP test-construction as test results would reveal teachers' success in helping their students achieve the required objectives of the course, and would be a good feedback for the development of the course they teach in general. Presumably, it is only fair to test what students have had an opportunity to learn. However, a system of continuous assessment whereby the regular progress of the students is checked and evaluated would be one of the valuable phases of test construction.

However, the following characteristics of a good test as cited by McGrath (1979:37) would be of importance in test design:

- i. The test should test only what it is supposed to test. A test of reading should concentrate on reading skills and sub-skills.
- ii. The test should deal with what is worth testing (e.g. a test of communicative ability should test language items of normal communication, not exceptions, and the ability to use rather than to analyse the language.
- iii. The test should test only what has been taught.

- iv. The test should reflect the emphases (time spent) of the teaching (this can be expressed either in the number of items on a particular area or by weighting the marks proportionately).
- v. The test should begin with easy items to encourage the weaker students.
- vi. The test should contain only questions which are mutually independent (i.e. an incorrect answer to one should not prevent the student from getting another one right).
- vii. The test should not contain: (a) ambiguous or (b) misleading instructions and mistakes, and
- viii. the test should be simple to score, and as far as possible objective.

Conversely, the testing process may generate performance conditions that would be considered a distortion of normal language use because of the emotional tension which accompanies the elicitation of the testee's knowledge (Kelly, 1981:177). Tests would also have the following limitations (Pumfrey,1977:42):

- i. Students' scores would vary from day to day on the same test,
- ii. students' motivation and attitudes would affect the results of the test,
- iii. the environment in which the test is administered would affect the test's results, and

iv. no one type of test of reading would give a global estimate of students' reading attainment, therefore different tests should be devised in each case to be used for clearly stated purposes.

Undoubtedly, tests should go hand in hand with the objectives of the course whereby specified needs and expectations of the learner would be met, i.e. tests should serve the specified purpose of the learner. Carroll (1981:4) gives the following parameters which would be taken into consideration in preparing specific purpose tests:

- i. the range of levels of linguistic competence of the testee,
- ii. the nature of the personal interaction likely to be involved,
- iii. the nature and degree of the communicative needs to be experienced,
- iv. the content and focuses of the relevant job or discipline,
- v. the job skills to be required, in terms of listening, speaking, reading and writing (in collaboration one with the other) as well as the language micro-skills concerned,
- vi. the essential job functions, notions and concepts, and

vii. the language content in semantic and lexical terms.

It is noted here that in EST test development, collaboration between inter-disciplinary sub-groups which consist of EST teachers as well as subject specialist teachers is necessary.

3.10.3 Administrative Procedures in Testing

The administrative aspect of the testing activity is important because it would affect the results of the test. Therefore, the tester should try his best to help the subjects do justice to themselves by providing and checking equipment which is going to be needed in the test, and seeing that a suitable testing situation be arranged. Pumfrey (1977:87) purports that the tester should ensure that:

- i. all materials, including spare pencils, are available for all subjects,
- ii. the room in which the reading test is to be administered is not subject to intermittent and/or extraneous noise,
- iii. desks or tables are appropriately spaced in group testing,
- iv. he has motivated the students to do the test by explaining the reason and purposes of the test and its significance to them and to the development of their institution and their country,

- v. he has both completed and scored the test himself before administering it to the subjects. It would be more fruitful if a colleague checks the test for him,
- vi. he can clearly differentiate between his role as a tester and that as a teacher, and
- vii. he keeps strictly to the timing specified in the test manual.

It is to be noted that students should be instructed to read the entire text before attempting to answer the questions of the text. In order to ensure that students read the entire text before commencing their answers, and that students would not return to the text while answering, if that is sometimes required, the text of the test and the questions should be typed on different sheets.

3.10.4 Testing Reading Skills

If we consider the teaching of reading skills as a continuous series of experiments, then the testing of reading skills would be considered a crucial joint in the process of teaching reading. Since we believe that there is still no one ideal method of teaching reading which would cater for all the inadequacies in the reading skills, teachers would continue to be interested in new methods and materials of teaching and testing reading.

Because of the nature of reading tests and of reading abilities, a teacher can never know with complete certainty that one given method or approach is better than another. The teacher's acceptance of this uncertainty, the abandonment of a dogmatic assurance in her own approach to the teaching of reading, whatever it may be, is vital (Pumfrey, 1977:17).

It is consensus that tests of reading would enable both teacher and course-designer to maintain and improve standards of reading, measure students' reading performance as one component in the educational programme, evaluate the adopted approach to the teaching of reading and diagnose students' particular reading skill deficiencies.

Actually, diagnosis of reading difficulties would help educational personnel obtain a better understanding of the reading process and glean information that would be crucial in planning a reading programme for the students whereby the students' weak reading skills would be captured and improved.

It is worth mentioning that the testing of reading skills and sub-skills would be paramount in developing educational research as delving into the intricate nature of the reading process is crucial if we intend to get at salient results which would help students achieve literacy of a global sense.

As far as teachers of reading skills are concerned, they should be trained to possess a high degree of professional skill in reading tests. Manipulating useful instruments and materials which would help in diagnosing and detecting students' difficulties in learning to read should also be practised. (Bullock Report, 1975:251), as those means would arouse the interest of teachers in students' reading problems and development. They would also lead to dissemination of fresh insights to teachers in the area of developing reading skills. Presumably, the more professionally competent and skilled the teacher becomes, the more adequate materials and highly developed procedures, including statistical analysis so as to diagnose and minimise weaknesses in his students' reading performance, he will require.

In effect, the teacher's gleaned information and experience in testing his students' reading skills would eventually help him be acquainted with the cruciality of students' individual differences, the variability of human behaviour, and the weaknesses of subjective assessments (Pumfrey, 1977:17).

Although reading tests would not reflect a global evaluation of students' ability and attainment in reading skills due to the intricate complexity of the reading process itself which, presumably, would be a mental activity, they would help, in one way or another, teachers, syllabus designers and educational personnel to get at more adequate decisions which would be, in essence, drawn on the basis of test implications.

3.10.5 Communicative Tests Relative to EST Reading Skills

3.10.5.1 Dictation

Dictation is a test whereby most of the language aspects would be covered. It would test "auditory perception, auditory retention, memory for sound/spelling correspondence, familiarity with lexis and structure (spoken and written) and very possibly other aspects too" (McGrath, 1979:40).

In a dictation test students' short-term memory will be challenged as in dictation students would not only attempt to make the appropriate discrimination in speech sounds of what they hear, but they would also associate with these sounds the meaning of the discourse they listen to. Thus dictation is an active skill whereby integration of different language skills would be evaluated⁽¹⁴⁾. A dictation test can be standardised by being put on tape and reused when required.

In fact, there is a family of dictation procedures: standard dictation, dictation with added noise and dictation/composition or dicto-comp. The first requires the testee to write down heard materials as read by an examiner or played back from a recording. The second involves a written version of the test with deleted words to fill in as he listens to the recorder or the examiner reading the text. In the third type of dictation, the noise accompanies the testing process as if the testee were listening to spoken messages

under noisy conditions. The fourth and the most difficult requires the examinee to listen to the text for several times. Then he is asked to recall the items he listened to from his memory (Oller, 1979:264)(see also Davies, 1975:122).

Though the first type of dictation, namely standard dictation, would seem the most appropriate dictation test to be adopted with FL EST students for its easiness and economy, it would sound plausible to make use of all those members of the dictation family procedure if we are after authentic-like tests whereby the naturalness of language use would be taken into consideration.

A good dictation is one which teaches and tests at the same time. In the dictation the text to be written is read three times. Firstly, at normal conversational rate while the students just listen. Secondly, it is read with pauses and punctuation while the students write. And thirdly, it is read at normal speed while the students check what they have written and minimise their mistakes (Byrne, 1980:179).

It is to be noted that the examiner should give enough time for the examinee while pausing to check and correct his writing. Students should also be instructed how to punctuate their writing, and a communication test would take this into consideration when scoring the dictation tests.

Dictation would be scored by allowing one point for every word correctly written down in the test (Carroll, 1980:96). Correct words are to be counted and a score is made. If there are inserted words in the protocol, they should be counted as errors and subtracted from the total score (Oller, 1979:276). In a dictation test for EST students I assume that any deviation from the norm, whether it includes deletions, distortions of form, intrusions or spelling errors, should be counted.

3.10.5.2 Cloze Tests

Cloze procedure is a family of techniques whereby the learner's internalised language knowledge is tested and information relative to the reader's efficiency in handling the linguistic facets of the target language when restoring missing or mutilated portions of text would be elicited (Ibid:344). Actually, cloze procedure was originally introduced as a way of testing reading skills (Oller, 1975:33). However, it seems now cloze procedure has been adopted as a reliable indicator of overall language proficiency (Oller et al, 1972:14).

Basically, cloze procedure is based on the idea that the mind has the ability to close gaps or to piece together fragments into a pattern (McGrath, 1979:39).

However, the most commonly-used type of cloze test is that which is formed by deleting every nth word of a text (Davies, 1975:122) (see also Neville and Pugh, 1980:359). For example an every 5th word deletion

ratio in a text would show 1/5 of the words being deleted out. Therefore the subject's ability to fill in correctly the blanks in the text reflects the global index of the subject's efficiency in studying the text, as cloze procedure deals with the inter-related ideas of the text which would best be absorbed by mutual understanding between reader and writer over contextually interrelated series of discourses (Taylor, 1953:417).

When selecting materials for cloze tests, texts which provide a sufficient number of 50 blanks are to be preferred to shorter texts. The recommended way for the application of deletion technique is by leaving blanks in the entire text at approximately equal intervals. Thus, counting the number of words in the text and dividing by 50 will result in the desired deletion ratio (Oller, 1979:365). For instance, a text of roughly 500 words when divided by 50 will lead to a deletion ratio of every 10th word. For 350 words of a text on every 7th word deletion ratio will yield 50 blanks. Thus, in a 350-word text, a suitable deletion ratio is achieved by counting from a word near the beginning of the text and deletion is applied every 7th word until 50 blanks are obtained.

Bachman (1982:61) rightly purports that cloze test procedure would lead to inconsistent results if it were based on the principle of random deletion. He suggests that cloze deletion should be based on a

'rational deletion procedure' whereby selected deletions involving syntactic, coherent and cohesive items would be involved.

One of the problems involving cloze tests is how to score responses. Two cloze test scoring techniques seem to be available in the market - 'exact word technique' and 'contextual appropriateness scoring technique'. As far as the former is concerned, a word in a given blank is scored correct if the testee replaces the very word used by the writer, if not the word is scored incorrect, even if it was a better word in some cases. In the latter, a word in a given blank is scored correct if it is either the exact word used by the writer, or fits the immediately surrounding context or is consistent with previous and subsequent elements of the text (Op.cit.:367-9). Oller gives the following example in order to exemplify a scale of degrees of appropriateness with reference to a particular cloze item in a particular context (Ibid:361).

Joe is a freshman and he (1) is having all of the problems that most(2) freshmen have. As a matterof fact,his(3) problems started before he even left home. (4) He had to do a lot of (5) things that he didn't like to do (6) just because he was going to go (7) away.

Oller (Ibid:371) has selected item (3) from the text above: 'his started before he even left home', to demonstrate his scale of degrees of appropriateness as follows:

- i. The best response (perhaps is the very word used by the author of the text - namely, 'problems'.
- ii. The second best (or perhaps, an equally good) response is a close synonym for the deleted word - say, the word 'difficulties'.
- iii. Perhaps the next best response would be one that preserves the overall intent of the text, but does so with an incorrect form of the lexical item used - e.g. 'bewildering', instead of, for instance 'bewilderment'.
- iv. A response that is appropriate to the local constraint of the item , but which is not appropriate to the meaning of the text as a whole would probably be judged more severely (certainly, it would be more incorrect than type ii or iii), e.g. 'methods'.
- v. An even more severe error would be one that failed to fit either the local or the long-range constraints, e.g. 'before'.

Oller, then, suggests a scale for awarding different points for the examinee responses based on a differential order - a score of 4 would be awarded for the very word of the writer; 3 for a perfectly acceptable substitute; 2 for category iii, 1 for iv and 0 for v.

Presumably, it would be impractical to adopt Oller's awarding scale with foreign language learners, as its application to their performance would be very highly daunting to them. Moreover, in such a test we would not be after mastery of semantic links among the words to be supplied in a given blank, but after assessing the mastery of global comprehension of the text. The test would also be a hard task to score from a practical point of view, particularly if we take into consideration the fact that even advanced students in L2 settings would hardly discern the semantic differences among most semantically related words in the target language⁽¹⁵⁾. Therefore, I assume that the very word of the writer, as well as any one which is contextually appropriate should be scored correct, no matter what level they have on Oller's scale above.

Finally, a teaching unit of 50 minutes would be a suitable period of time for filling in the 50 blanks of a cloze test for foreign adult students (Ibid:377). Students should read the whole text carefully before attempting to fill in the spaces.

3.10.5.3 Essay Writing Test

Essay writing is an important skill in L2 students' evaluation, because it requires on the part of the testee an organisational ability whereby ideas would be expressed in the written mode.

Essay writing would be a useful test for EST students because it would assess students' ability to

demonstrate their mastery on their study skills, as well as their attainment in expressing themselves in the target language relative to their field of specialisation.

Though essay testing may require more work of the teacher and of the students than many other testing procedures, it is considered to be a profitable assessment technique (Oller, 1979:381).

As science students need to write laboratory reports on experiments in their field of specialisation, to test their performance in essay writing would seem a most relevant type of test to their study. Writing a laboratory essay or report would involve reading and interpreting scientific articles, dealing with organisation of ideas and results relevant to laboratory experiments, using references, etc. Essay-writing test activities would draw invaluable results from students' academic reports as such reports cover focuses on such scientific tasks.

But how would an essay-writing test be conducted? Students would be given sufficient time for preparing and writing the essay, approximately a month. Marks would be distributed among the various skills involved in writing an essay: organisation of the essay, use of references, mastery of self-expression, clarity of scientific ideas, evaluation of previous literature, and language appropriateness and grammatical accuracy.

Essay writing would not be an easy test to mark because of the diverse components to be encountered in testing it. However, as far as language appropriateness and grammatical accuracy of the essay are concerned, scoring involves restating grammatical errors, errors relative to failure to express the intended meaning, deletions of superfluous or extraneous items and insertion of obligatory information which the testee fails to include in his protocol. In this context, language errors would be of three types: items to be changed, items to be deleted and items to be included.

As far as short essays are concerned, probably literary-based ones, Oller (1979:387) purports that evaluation of an essay would be achieved through computing the result of scoring by counting the number of error-free words, subtracting from them the number of errors and dividing the result by the total number of words in a model written essay on the same topic and which is to be given to the student when his protocol is handed back⁽¹⁶⁾. Thus Oller's (Ibid) scoring method is read as follows:

$$\text{Essay score} = \left[\begin{array}{l} \text{the number of error-free words} \\ \text{in the student's protocol} \end{array} \right] \text{ minus} \\ \left(\begin{array}{l} \text{the number of errors in the stu-} \\ \text{dent's protocol} \end{array} \right) \text{ divided by (the} \\ \text{number of words in the rewritten} \\ \text{text)}.$$

It seems to me, however, that Oller's 'Essay Scoring' formula above would evaluate the linguistic and quantitative facets of the essay, but would miss the communicative effectiveness of it. Therefore, in order to evaluate the textual validity of a scientific essay our scoring method should involve, in addition to the assessment of study skills such as the adequate use of references, essay organisation, etc., organisational consistency, paragraphical, rhetorical, stylistic, clarity of expression, neatness, etc. In short, the global effectiveness of the essay as a piece of communication relative to a certain field of specialisation would be taken into consideration in our model of scoring. In the light of the aforementioned assumptions, I would assign 25% of the mark to the essay's communicative effectiveness, 25% to essay organisation and adequacy of the use of references (of course, these would be subjective rating) and, finally, 50% of the mark to language appropriateness and grammatical accuracy as shown by Oller's scoring procedure above.

In order to give more freedom for the scorer to devote some value for the communicative properties of the essay, I would like to modify Oller's procedure to be something like the following formula:

Scientific essay =

$$\frac{\text{Number of error-free words} - \text{number of errors}}{\text{Number of words in the model essay}} (50\% \text{ of mark}) +$$

Score

Communicative effectiveness (25% of mark) +

Adequate use of references (25% of the mark).

I assume that the above modified formula, though it would be considered semi-objective, so to speak, would capture other errors such as punctuation errors, spelling errors (particularly those which do not distort a word's morphology) and neatness of writing which are not counted in Oller's essay score method above (see also Ibid:390). Such mechanical features and many others relative to communicative effectiveness of the writer's message would be taken into consideration in the modified formula above.

3.10.5.4 Translation Test

Traditionally, as translation was carried out at the level of usage rather than use and at the time when translation was done word by word, it was rightly argued that translation would distract a learner's attention from the meaning conveyed by the target language. But within the view of communicative language teaching and testing whereby translation is considered a meaning bearing process at the level of language use (Widdowson, 1978:18), translation would prove to be a valuable teaching process as well as an effective indicator of students' global understanding of the message. Such a process would easily be accommodated within the discourse-to-discourse schemes, thus the learner would conceive of the L2 in the same way as he conceives of his vernacular, i.e. as a tool of communicative functions.

Therefore, translation would be considered as a reliable communicative test, as it would supply the examiner with valuable information about students' language proficiency in the target language if the test involves translation from the native language into the target language. It would also be a valid indicator of the testees' level of comprehension in the target language if the test involves translation from the target language into the vernacular.

Studies conducted by Swain et al (1974) have shown that translation technique would be an adequate procedure for checking students' L2 performance. A good example which shows how translation would indicate students' level of performance was shown in an experiment done by Oller, Bowen, Dien and Mason (see Oller, et al, 1972:13) in which it was shown that translating a text from one language into another would help the construction of cloze tests of equivalent difficulty in both languages whereby an approximate comparison between the performance of similar groups (for instance, the same grade in school) of native speakers of the language concerned is possible.

3.11 Conclusion

To summarise, the following assumptions would be borne in mind in developing reading skills of EST students:

- i. concentration on reading comprehension, exercises and assessment would take into consideration global understanding of the EST text. Hitherto,

reading skills would concentrate on the discourse and textual facets of the materials, rather than on sentential and intersentential levels;

- ii. the communicative facets of the reading skills would be developed by helping the learner to do or expect to do things with what he reads. Thus, reading should have a communicative function if it would act as a feedback for the student's process of communicative effectiveness in the target language. In this context, integration of language skills is of crucial significance. Therefore, listening to a recorded lecture by a native speaker relative to the written text, note-making and summarising what one reads, employing information gleaned from written texts or scientific journals in debates, seminars, simulation activities, etc. would be of crucial significance in developing EST students' reading competence; and
- iii. EST authentic texts would help EST students understand and eventually deal directly and appropriately with scientific materials germane to their field of specialisation. On the other hand, simplified and contrived materials would deprive EST students of being aware of the rhetorical organisation of authentic materials which they would require in dealing with scientific books and journals. Dealing with authentic texts which are within EST students' general reading competence would help them get the adequate procedure to approach new scientific materials, and be independent and well-competent readers of scientific and

technological materials germane to their field of specialisation.

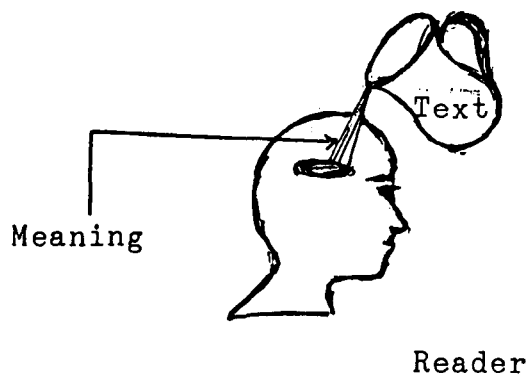
Finally, developing reading skills would be one of the crucial TEFL strategies which, if adequately dealt with, would help bridge the gap between the theory and practice of TEFL methodology, particularly EST teaching methodology in foreign language teaching/learning situations such as the one in Iraq.

Notes Related to Chapter Three

1. Traditionally, it was erroneously thought that receptive skills such as listening and reading were passive skills. This stemmed from a belief in traditional language teaching that learning took place only when overt production was carried out (Byrne, 1980:99).

Nuttall (1982:5) has illustrated the traditional view of reading as shown in the following figure:

Traditional view of reading. The text is full of meaning like a jug full of water, and it can be poured straight into the reader's mind which soaks it up like a sponge. The reader's role is a passive one.



2. Porter and Roberts (1981:37) have based their statement on estimates carried out by Hughes and Trudgill, (1979), who estimated that 3% of the population of Britain speak R.P.
3. Following are the categories for the scale of reading speeds which is widely employed in Leew's reading scale to evaluate the speeds of the general public in Britain reading comparable passages in their native language (see Hill, 1981:275).

Scale of speeds in words per minute

170-199	Very slow
200-229	Slow
230-249	Average
250-299	Above average
300-349	Medium fast
350-449	Fast
450-549	Very fast
550-650	Exceptionally fast

4. Simplification of scientific lexical items.
5. Increasing students' scientific terminology.

6. Simplification of rhetorical expressions.
7. Increasing students' scientific terminology.
8. Simplification of logico-grammatical items.
9. Increasing students' scientific terminology.
10. Simplification of scientific terminology.
11. Reinforcement of communication through non-verbal discourses.
12. Increasing students' scientific and rhetorical expressions.
13. Answers for the exercises in this section are shown in Appendix 3.
14. See ft.17, Chapter Four.
15. This should not be considered as an excuse for ignoring assessment of the problem of semantically linked language teaching problems. On the contrary, it would be a suggestion for devising an effective test for it, probably one which would take into consideration implications arrived at in current 'semantic fields' teaching practices (see, for example, Channel , 1981:117).
16. See Appendix 4.

CHAPTER FOUR

**Designing a Communicative EST Reading
Skills Course for Students of the
Faculty of Medicine in Iraq: A Case Study**

CHAPTER FOUR

Designing a Communicative EST Reading
Skills Course for Students of the
Faculty of Medicine in Iraq: a case study

4.1 Preliminary Note

In this study I am going to shed some light on some of the language needs of Iraqi undergraduate medical students doing their preliminary year in Kufa Faculty of Medicine at Al-Mustansiriya University in Iraq (henceforth, KFM), delineate a step-by-step procedure for designing an EST reading skills course for them, and show the way in which I applied the course in KFM, and then analysed and computed the results.

To begin with, the students are expected to have considerable language problems during their period of study in the faculty which covers six years, particularly in the first year, despite the fact that they have studied English for eight years at primary and secondary schools in Iraq before they are eligible to attend the University (see table 71, p. 401).

In order to improve the students' standard of English and help them cope with their studies in the faculty, the university has devised a one-year EST course whereby students attend two hours a week of English. The course is conducted by the Faculty of Arts and taught in KFM as part of the faculty syllabuses. The EST material in the faculty

comprises solely a textbook which contains twenty contrived extracts from various scientific topics, namely physics, biology, mathematics and chemistry.

However, it was clear from the study that the main needs of the students are to be able to read English medical materials extensively and effectively, to be able to follow lectures in English, to be able to write reports of the laboratory work they have done, to understand examination questions and write appropriate answers in English. They would also be required to discuss medical topics with their subject teachers in a classroom situation, and write scientific essays relative to their study of specialisation as they advance in their medical course in the faculty.

It seems to me that present ESP course design models, which could be viewed as something like diagram 27 below, would not account for the dynamic aspect of the course design process which should take into account the rapidly changing nature of the ESP courses, particularly those ESP courses which are to be conducted in the Arab world. To me foreign language teaching/learning process is a recycling but open⁽¹⁾ activity, once it stopped experimentation it would change into dogma. Therefore experimentation, feedback, revision and ongoing evaluation should constitute the main parameters of any healthy ESP course.

Needs analysis will almost certainly continue to be essential to ESP, but I feel that for practical reasons a severely modified form of needs analysis will have to be practised. Interesting though it may be to read about courses which have been planned and specified in minute detail (Robinson, 1983:166).

Given this point of view, I wish to outline a model for ESP course design which could be something like diagram 28 on page 267. I think this model, on which the hypothetical EST course in KFM is going to be based, would satisfy the demands of the present ESP courses since the ESP theory has not taken a final shape yet, and the ESP teaching/learning situation, particularly in the Arab world, require continuous evaluation, assessment and rectification.

Diagram 27

Static Course Design Procedure

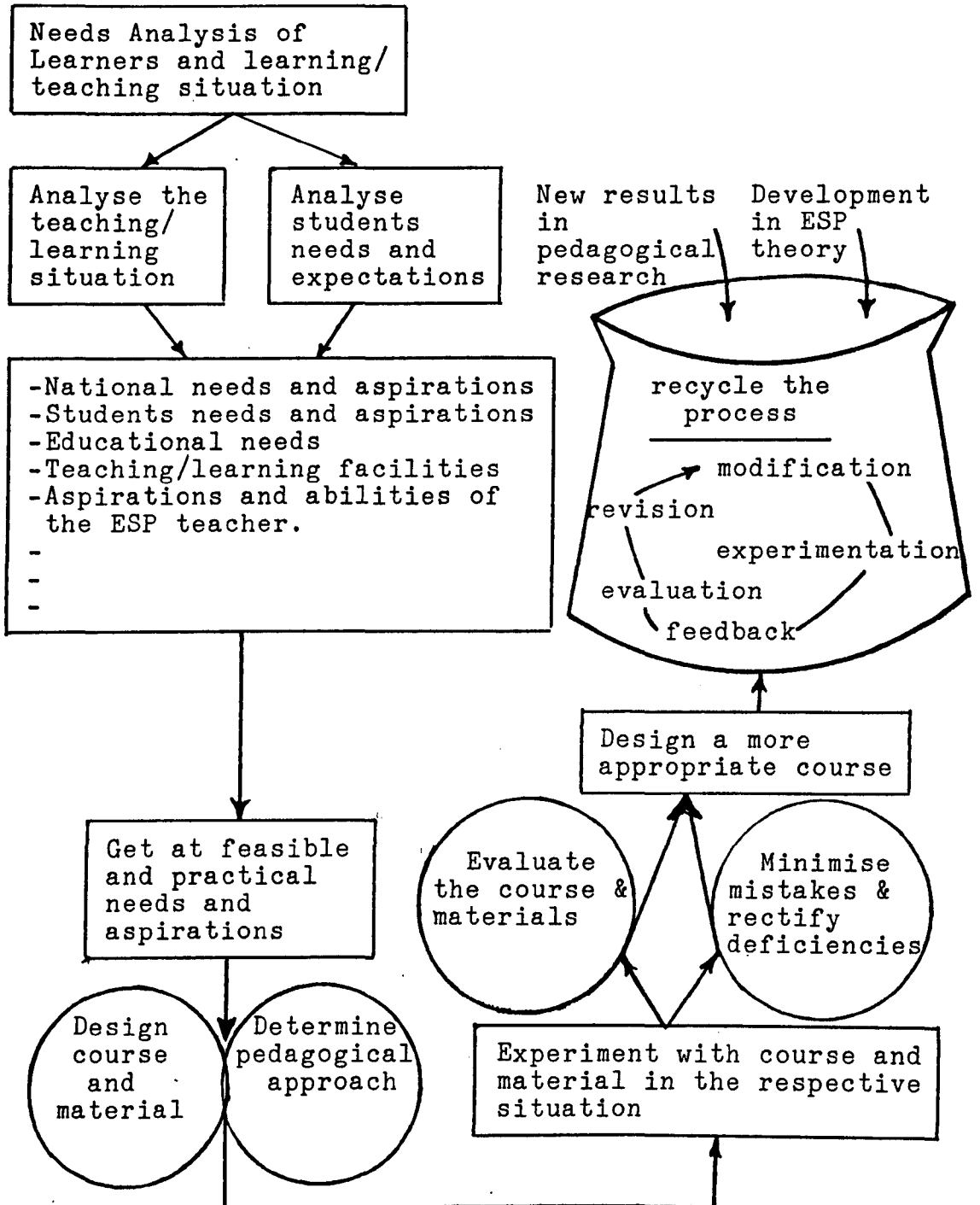
Needs Analysis . . . _____ Course Design

4.2 Steps in Planning the Course

In what follows, I am going to relate point by point how I planned and applied the EST course in KFM. I am going also to shed some light on the essential parameters which would be worth considering in designing EST courses at university level in Iraqi situations.

Diagram 28

Dynamic Needs Analysis Procedure



It is to be noted that I would run the course between October 1982 and January 1983, the students' sample would be divided into an experimental group and a control group and I would teach both groups, but for the control group I would use existing materials and techniques.

4.2.1 Making Use of Previous Experience

To begin with, in addition to the results I got in this study, several years' teaching of ESP in the Iraqi university resulted in my conviction that the ESP teaching in the Iraqi university should be modified if not completely altered. When I took over responsibility for teaching ESP in the Faculty of Physical Education in 1974-75 and Faculty of Fine Arts in 1975-76, Faculty of Education, Physics Department in 1976-77 at Baghdad University, Faculty of Jurisprudence in 1977-80 and Kufa Faculty of Medicine 1979-80 at Al Mustansiriya University, I was faced with various difficulties arising from different sources. Though closely interlinked in their effects the causes of the difficulties encountered could be classified in the following way: first and foremost, the students' aspirations and precise needs had never been analysed, secondly, the ESP pedagogy used was a mere adaptation of traditional secondary school methodology, and without any deep-rooted attempts to adapt it to the new context, and the teaching material would not

serve the needs of the students. The result was a lack of interest in the course from both the students and EST teachers, and the educational institution would consider the EST course a burden on the students' timetable. Therefore it was necessary to think of a way to effect radical changes in the teaching of EST in those universities. My discussion of the teaching situation of English with the administrators and the teaching staff in Kufa Faculty of Medicine in Iraq during my teaching experience in that faculty has in essence, pushed me further to look for new ways to attempt to improve the EST situation in that educational institution.

However, I have to concede that although I had six years experience in teaching ESP in Iraqi universities as I mentioned before, and was aware of most of the problems of teaching ESP there, I was not theoretically orientated enough in ESP to deal with those problems. This would confirm Widdowson's argument (Widdowson, 1983) that teachers would not be competent enough to deal with their teaching problems without being theoretically orientated to do so. This would imply that experience would confront the teacher with practical problems, but to adopt a theoretical orientation to the task would be something indispensable to the researcher teacher who is interested in developing the educational situation in his institution.

4.2.2 Evaluating the Learning/Teaching Situation in KFM⁽²⁾

4.2.2.1 The Educational Setting

..... I have come to believe ... that knowledge of how the educational environment in which the ESP programme is to operate really works is one of the course-designer's or project-manager's first priorities.

(Swales, 1980a:70).

KFM is one of two faculties of medicine at Al-Mustansiriya University, Baghdad, Iraq. It was founded in the academic year 1978/79. The first group of students are expected to graduate from this faculty at the end of the academic year 1983/84.

The academic year in the faculty runs over two 15-week semesters, the first from early October to the end of January. There is then, approximately, a two-week holiday. The second semester begins in the third week of January and ends at the end of May. Examinations take place in the last two weeks of each semester. In the year when the research was carried out, the duration of the semester was three months commencing from November 1st, and the studies continued till the end of January. The semester examination was

substituted for an average of monthly tests, quizzes and laboratory assessment. The first year programme of the faculty is shown in table 1 on page 276 which is the English translation of the Arabic version of the KFM programme shown in Appendix 5. A quick glance at the students' timetable of the curriculum would show that teaching contact hours were high and students had to work hard.

Finally, it seems that one of the advantages of designing an EST course in KFM is the oneness of the teaching/learning situation as the students and the educational situation constitute a homogenous group in terms of background, needs, interests, motivation and proficiency in the target language. A homogenous group would also save us the trouble of looking for more than one type of text which should be relevant to the specific areas of students' specialisation (Mackay and Mountford, 1979:121).

4.2.2.2 The Student

As far as the students' educational situation is concerned, one can discern the following points:

- i) the student intake is required to have passed the General Ministerial Examination for the Scientific Branch (the national secondary school leaving certificate examination/scientific section). (Central Admission Bureau, 1982).
- ii) faculty admission do not specify a minimum level in English (Ibid).

iii) although students' level of attainment in English in the General Ministerial Examination is very high (see 4.2.7.), their real level on average is not up to the required standards in English. This could probably be due to the measurement of the General Examination which is a paper and pencil and structurally orientated type of language evaluation, which would not mirror the examinees' global level in the target language.

Broadly speaking, the students, upon entering the faculty of medicine, are expected to face the following problems:

- i) the shift from literary based English materials and some very simple scientific topics in the Iraqi textbooks of English, to relying on authentic English textbooks and periodicals in basic medical science which would pose a threat to their knowledge of medical science and their competence in English, particularly at the discoursal and textual levels (see The New English Course for Iraq, Book 8, 1982, and The New English Course for Iraq, Literary Reader 3, 1982).
- ii) the shift from teacher-centred information to self-centred information: a situation which

demands of them to rely heavily on private skills, note-making and note-reconstruction at the discursal, paragraph and textual levels in which they are still beginners, and iii) the very restricted attention span of many students. This is due to various factors and would require students to be motivated by rapid changes of learning activities.

However, average students would be familiar with some aspects of greeting, reporting and explaining at the sentence level but with less confidence when they deal with connected discourse. Moreover, they would already have access to science techniques and methods such as conducting laboratory experiments, describing scientific processes, transcoding, etc. in their science studies in their L1, i.e. Arabic. Presumably, what would be completely outside the students' ability is to deal with authentic English texts, scientific or otherwise.

From my experience of teaching ESP in Iraqi universities, including KFM, I know that the students had, on university entry, the expected EFL level in a learning situation where the L1 is the language of instruction, before university entrance as, rightly, in my view, pointed out by Swales (Swales, 1978:43)-reasonable vocabulary (but not related to their field of specialisation), grammatical knowledge (with

inappropriate application), the basis of serviceable reading and writing skills (in simplified texts of literary English), serious interference problems in listening comprehension of normal English, and serious hindrance in oral self-expression in English.

My experience of the learning environment gave me a general view of what concerned students in KFM at the time. They were mainly concerned with reading and retrieving their lecture notes, listening to lectures in English, discussing relevant topics in classroom and writing laboratory reports on experiments they carried out in the laboratories. Therefore, my initial understanding of the students' needs in terms of the language skills in KFM could be ranked in decreasing order of importance as reading, listening, writing and speaking. I was also of an opinion that study skills such as note-making and note reconstruction should be paid adequate emphasis as developing them would lead to the improvement of students' required study skills in KFM.

4.2.2.3 The EST Material

In order to shed some light on the EST material in KFM, let's have a look at the contents of the course, which simply comprises a textbook, namely English studies series 3, Physics, Mathematics, Biology, Applied Science, edited by William F. Hawkins and Ronald Mackin (1966), and published by Oxford

University Press (Sixth Impression). The book contains twenty extracts written by different authors for various audiences. The extracts fall into five major groups and concentrate on the following topics (Hawkins and Mackin, 1966:viii).

1. The evolution of the solar system and two conflicting views on the origin of the universe.
2. Darwin's theory of evolution and natural selection; Mendel's theory of inheritance; and the probable effects of atomic radiations on the human race.
3. The value of mathematics as a scientific tool, with some ideas on probability.
4. The practical value of scientific ideas in making human life more comfortable, and in improving health and welfare.
5. Basic ideas on the atomic structure of matter; the relation between matter, mass and energy; and a few facts about the scientists who were responsible for the development of these ideas.

The method of teaching the reading texts would be discerned by studying the following quotations which I have extracted from the introduction in the textbook (see Ibid).

Al-Mustansiriya University

Table 1

Kufa Faculty of Medicine

Outline Timetable of Curriculum

Registration Office

First Year 1982/83

Morning					Afternoon			
	8 - 9	9 - 10	10 - 11	11 - 12	12 - 1	1 - 2	2 - 3	3 - 4
Saturday	Bio-chemistry lecture	Anatomy lecture	Physiology lecture	National Education (in Arabic) lecture		Histology(lab)GA*		
						English language GB		
						Biochemistry(lab)GC		
Sunday	Histology lecture	Bio-chemistry lecture	Physiology		Anatomy (lab) Gs. A, B & C	'Histology (lab) GB		
						English language GC		
Monday	Anatomy lecture	Bio-chemistry lecture	Histology lecture	National Education (in Arabic)	Physiology (lab) GA			
					Histology (lab) GC			
Tuesday	Physiology lecture	Histology lecture	Bio-chemistry lecture	Anatomy lecture	Anatomy (lab) Gs. A, B, & C			
Wednesday	Physiology lecture	Biochemistry (lab) GB			Biochemistry (lab) GA			
		English language GA						
		Physiology (lab) GC			Physiology (lab) GB			

* 'lab' is abbreviation of 'laboratory work' and 'G' is abbreviation of 'Group'

i) The aim of the book is to help students of science to understand 'scientific English' and to express themselves appropriately when dealing with scientific topics.

ii) Each extract is accompanied by copious notes, both on the subject-matter of the text and on important grammatical and vocabulary aspects of scientific English.

iii) Scientific language cannot be divorced from scientific ideas. The exposition of the ideas of science demands careful choice of words and careful use of sentences.

iv) The notes on the language of the text deal with vocabulary and grammar.

v) Although this book is not intended to deal primarily with the problem of spoken scientific English, a certain amount of information is given about the pronunciation of individual words.

Material analysis and objective analysis of the textbook used would give you the impression that the extracts and exercise materials contain outdated scientific knowledge. The textbook presents simplified and abridged texts which are difficult in content as well as in syntax and vocabulary as far as the Iraqi student on university-entry level is concerned. Besides the material involves a number of

particular structures and vocabulary items which are dull and rambling (see appendix 8). In studying these extracts, the EST students would face a problem of content as well as a problem of language structures and vocabulary which would not be directly relevant to their needs and interests.

We read what is relevant to our affairs or what appeals to our interests: and what is remote from our particular world we do not bother to read at all.

(Widdowson, 1978:80).

Hitherto it seems that one reason for the apparent lack of effectiveness of the textbook would be the problem of student motivation as the prescribed textbook would fall short of dealing with the students' most immediate needs, i.e. the language requirements of the subject they are taking at the university. Thus, the students would see the English course as irrelevant and an infringement on their valuable time.

Therefore I felt it was necessary that the EST course used in KFM would be reappraised on the basis of students' needs, motivation and current abilities.

4.2.3 Guaranteeing a Place For Conducting the Fieldwork

The educational setting is a very important parameter in any ESP work. Therefore, the problem of guaranteeing a place in which the fieldwork is to be conducted should be settled as early as possible otherwise the fieldwork researcher would have to

make radical modifications in his ESP materials and the theoretical approach he was going to adopt if everything did not go as well as it was planned. Thus settling the problem of the educational setting would place the research worker into the most appropriate perspective of the task he was going to engage in. Once the setting was settled the field work researcher would set to adjust himself theoretically and more precisely to the task.

4.2.4 Drawing Up a List of General Objectives

To begin with, it would sound reasonable at this stage to make an initial distinction between two types of ESP courses as far as dealing with the ESP course general objectives is concerned: an ESP course which the course designer has approached before, and another one which the course designer is approaching for the first time. Presumably, to plan the students' relevant general objectives would not be so difficult a task for the research worker who has already taught a course in the same educational setting (Frydenberg, 1982:158).

However, questionnaires and diagnostic tests are indispensable in designing a course as they would shed light on the students' strong and weak language and educational points as well as on other aspects which would modify or even change some of

the researcher's views of the educational situation and students' needs and requirements.

Given that a great deal of time would have to be spent by the students in KFM on reading textbooks, lecture notes and other notes, they would glean and reconstruct from reading reference books and periodicals and listening to lectures, it was the main purpose of this EST course to develop the students' performance in comprehending medical written English. Therefore I wanted to select and design exercise materials that would enable the students to interpret medical texts mainly at the discourse and textual level. It was felt that those texts to be relevant should be authentic, suitable in content and linguistic level to the students as well as interesting and of an informative nature. It was also decided that the course would also cover some study skills relative to reading comprehension, namely note-making and note reconstruction as well as reference using. Developing micro reading skills such as scanning, skimming and search reading were also thought to be a necessity.

The list of skills which were drawn for the course were as follows (see Price, 1977:26, Heaton, 1977:30, Dudley-Evans, 1977:38, and Nuttall, 1982:34):

A. Reading Skills

- i) skimming

- ii) scanning
 - iii) search reading
- B. Study Skills
- i) note-making and note-reconstruction
 - ii) reference and library using
- C. Integrated Skills
- i) classroom discussions via silent reading in group work activities.
 - ii) listening via reading aloud with explanation.

It is to be noted that the skills mentioned above were intended to be tentative until a full analysis of students' needs would be achieved. A tentative timetable for the distribution of course components and teaching hours is shown in table 2 below.

Table 2

A Tentative Timetable For The Distribution Of Course Components and Teaching Hours

Date ⁽³⁾	No. of Weeks	No. of teaching hours	Material and Activities to be covered
October 1982 5-13	2	-	Contact with staff. Professors questionnaire.
October 1982 16-30	2	4	Pre-course test. Topic 1. Students questionnaire.
November 1982 1-30	4	8	Topic 2 and 3.
December 1982 1-31	4	8	Topic 4. Tests.
January 1 - 15	2	4	Topic 5. Tests.

It was decided that five topics⁽⁴⁾ were to be covered during the course. Two teaching hours and sometimes three (depending on the length and difficulty of the topic) were decided to be devoted to each topic, including dealing with the relative exercises and group work techniques. The remaining teaching hours were left to cover tests, questionnaires, teaching note-making, laboratory report writing, essay writing, and reference and library using.

4.2.5 Selecting and Preparing Relevant Materials for the Course

In the ESP (English for Specific Purposes) context, subject-matter may be an important part of 'what is taught', or it may be simply the 'carrier' of all the language content (Allwright, 1981:8).

To start with, in selecting the texts, I had in mind the following criteria (cf. Moore, 1977:47):

- i) Is the text suitable for students' specialised study?
- ii) Is it interesting for students to learn and teachers to teach?
- iii) Is it at an appropriate level of conceptual difficulty for students and teacher?
- iv) Is it at an appropriate linguistic difficulty for students?
- v) Is it an authentic example of academic English?

- vi) Does it provide variety?
- vii) Does it involve appropriate reading tasks for students, the educational institution, the relevant country, and does not clash with the country's cultural and national interests?

When I started looking for texts I had in mind most of the information relating to the learners' general language attainments, their background at home: social and educational, their assumptions about university life, their professional and social aspirations and the national aspiration of their own country. Actually, the patterns of those factors in any given educational setting are likely to be unique even if in particular respects analogies can be drawn with ESP courses elsewhere. Therefore, one has to bear in mind in designing an ESP course in an Arab country that "the controlling factors in an Arabic speaking society are at any rate certain to differ substantially from those which govern EFL programmes devised for learners at Universities in America or Britain" (Chamberlain and Flanagan, 1978: 37). Factors such as consistent and strong interference of L1, learner standard both in the target language and the specialised subject of study, and notions related to teacher-students interaction would substantially impinge on the

teaching/learning situation (ibid).

In order to avoid selecting texts so advanced that students would be confounded by both the complexities of the language and the information displayed in the medical texts, I put emphasis, in my selection, on the following principles which are cited by Mackay and Mountford (1979:122).

- i) materials should be selected from the specific area of the field upon which the students are engaged and that would provide them with motivation which is an important parameter in the EFL situation, and
- ii) the materials should be no more advanced than students knowledge of the area.

Given that the main aim of the course is to develop reading skills, I decided that an assumed way of achieving that aim is to use authentic medical texts which would be suitable to the students level in both general and medical English. The material used in the study is as follows:

First: the material of the experimental group.

A. Reading texts chosen from medical journals⁽⁵⁾ with relative exercises I constructed for homework activities (see appendix 6). The five topics are the following:

- i) Skin and Skin Diseases
- ii) Bones

- iii) Chest (Thorax)
- iv) Nose
- v) Nervous System

B. Reading texts chosen from the journal mentioned in ft. 5 above, to be used for group work activities. The five topics which were selected are as follows (see appendix 7):

- i) Allergies
- ii) Bronchitis
- iii) Impacted teeth
- iv) Pain killers
- v) Cold sores

Second: the material of the control groups.

A. Reading texts with exercises from the students' present EST textbook. The five selected topics are the following (see appendix 8):

- i) The origin of the Sun and Planets
- ii) Evolution and Natural Selection
- iii) Atomic Radiation and Life
- iv) Banting and the Discovery of Insulin
- v) Metallurgy: Making Alloys

Third: common topics taught for both experimental and control groups:

- i) Note-making and note-reconstruction (see 4.2.11.2.1).
- ii) Writing laboratory reports (see 4.2.11.2.2).

- iii) Reference using (see 4.2.11.2.3).
- iv) Short essay writing (see 4.2.11.2.4).

It is to be noted that while the aim of the selected and varied topics in KFM-EST textbook is to simplify materials so as to bring it close to the students' predicted level of linguistic and content competence and thus claiming to help their intake, the authentic medical texts used in the experimental group aim at helping the students with their intake not by directly making comprehension within their reach but by guiding them to interact with the text and thus build reading strategies which would help them cope with their specialised texts (cf. Bhatia, 1983:46).

All topics selected for the experimental group are authentic medical texts with up-to-date information. The texts seem to be designed to be accessible to the non-specialist as well as to the specialist . They seem to also provide a vehicle of general interest for the practising of reading skills as well as for gaining medical information which the students would require in their first year of their studies in the Iraqi faculty of medicine.

However, in preparing teaching/learning materials, the course designer would go through three phases, namely "things to decide, actions to

be taken on the basis of those decisions, and a process of review to feed into future decision-making" (Allwright, 1981:5). It seems to me that these stages put by Allwright are crucial for devising and modifying the material to serve the aims of the experimental course in KFM i.e. answer the needs and aspirations of the students at any stage of the course. Therefore, those decisions, I believe, would be tentative until they prove to be practical when applied in the relative situation.

4.2.6 Orientating the EST Teacher to the Students' Specialised Materials

While I was examining medical texts to be used in the EST course, I found it necessary to examine carefully the broader body of the students' specialised materials taught simultaneously with the EST course as well as other materials used in the students' medical educational ladder. First I started examining the table of contents of the basic textbooks and reference books which were to be used by the students in KFM (see appendix 9). (cf. Mackay et al 1979:79). I also went through some topics which I found of interest to me and relevant to the students' textbooks. This procedure, in effect, provided me with a fairly clear idea of the scope of principal branches contained within students' field of study, helped me get a manageable picture of the ramification of the students' specialised subjects, made

me acquire some essential basic vocabulary for the field of study of the students concerned and it helped me select medical reading tests for the experimental group which would be closely related to the students' specialised topics. Indeed my keeping abreast with up-to-date medical journals, booklets and posters issued by the National Health Service in the United Kingdom, watching medically related programmes shown on the British television, and my frequent discussions with colleagues who are studying medically related studies at Sheffield University helped me get a certain amount of confidence in dealing with medical topics. This confidence I found later on of a great help in the classroom when I applied the EST course in KFM.

4.2.7 The Sample

The sample comprised 114 students: 86 boys (75.44%) and 28 girls (24.56%). All students were secondary school leavers of the scientific section. Their average score in English in the ministerial examination (Iraqi Secondary School Leaving Examination) was 83.40⁽⁶⁾.

The faculty has divided the students randomly in alphabetical order into three classes: A, B and C. The division was pre-arranged and was not in my control. As far as the EST course is concerned, they were named as 'Experimental Group', 'Control Group 1' and 'Control Group 2'. The 'Experimental Group' contained 39 subjects : 25 boys

and 14 girls; the 'Control Group 1' contained 34 subjects: 30 boys and 4 girls; and 'Control Group 2' contained 41 subjects: 31 boys and 10 girls. The students' motivation towards their medical studies and English language seemed to be strong as 97.42% of the subjects (see table 16, p. 304) showed their willingness to further their studies in medically related subjects in English after getting the MBChB degree.

In fact the preEST test I conducted at the beginning of the course, my own classroom observation of students and personal contact with them seemed to give me evidence that the new intake of students was of a higher standard in both academic and English language than the previous intake of students I taught in the academic year 1979/80. This might be one of the reasons behind students' motivation towards the EST course which I felt was stronger than that of the groups I taught in 1979/80.

4.2.8 Evaluation and Needs Analysis Procedures

To specify the needs and aspirations of the students which would be catered for by the course in KFM, five main procedures were used. First I made use of my previous experience in teaching an EST course in the same educational institution. Secondly, I examined the students' medical textbooks and discussed students' needs with three colleagues who used to be instructors in the faculty of medicine at three different universities in Iraq. (7)

Thirdly, I subjected the students to a pre-test which helped me gauge students' linguistic and medical conceptual attainments. Fourthly I conducted three questionnaires: one for the subject teachers to inquire of them what they believed the students' requirements were, and two other questionnaires for the students: the first attempted to identify students' needs from their own point of view, and the second inquired from the students to give an evaluation of the course. Fifthly, I made use of my own observation of classroom interaction, direct contact with the students and teaching staff, continuous tests and quizzes, and analysis of students' recorded oral classroom interaction.

4.2.8.1 Professors' Questionnaire

No doubt administration of questionnaires and/or structured interviews for staff and students in order to find out students' needs and evaluate language-course components produce results which would help design relevant ESP courses and may lead to changes in most of the initial planning of the course (Mackay, 1978:21). Indeed, questionnaires and direct contact findings would be of much use in gathering information and decision-making even after the end of the course to be used for an overall evaluation and development of the ESP course.

As questionnaires would reveal the present learning situation of the students and the ideal situation in part as well, they would enable the course designer to prepare syllabuses which would help in bridging the gap existing between the two situations: the present and the ideal (Rocca and Pusey, 1977:87). One, however, should not over-estimate the results of the questionnaire as sometimes the gleaned information might be dubious due to many uncontrolled factors (Allison, 1981:378-9). Nevertheless, other results got at throughout the course would lead to make a good match with the results of the questionnaire, and the course designer has to look for all the results before a final decision of the course design is to be made.

In order to elicit more information about students' needs a questionnaire was administered to the sixteen subject teachers in KFM.⁽⁸⁾ (See appendix 10). The first version of the questionnaire was discussed with an Iraqi instructor who graduated from and taught in the faculty of medicine in Iraq. He was an instructor in KFM before commencing his MSc studies in the U.K. (see ft. 7). Consequently, some questions which were opaquely phrased were rectified and some other irrelevant information was deleted.

However, as far as the results of the "Professors' Questionnaire" is concerned, all subject teachers

who answered the questionnaire have indicated that English is necessary for graduating as a well-qualified professional in medicine in the faculty. The results of the questionnaire have also shown that the development of reading skills comes at the lead of other English language skills which students in KFM would need in order to cope with their studies in the faculty as shown in table 3 below. It would, however, be interesting to note that while the Iraqi subject teachers have given more prominence in their response to reading skills, the foreign subject teachers have given more prominence to speaking skills as shown in tables 4 and 5 respectively.

Table 3

The English language skills which the students in KFM would need to develop from the subject teachers' point of view⁽⁹⁾

Language skills ranked in order of importance		% (10) N = 16
Reading	1	82.81
Listening	2	78.12
Speaking	2	78.12
Writing	3	76.56

Table 4

The English language skills which the students in KFM would need to develop from the Iraqi subject teachers' point of view

Language skills ranked in order of importance		% N = 9
Reading	1	91.66
Listening	2	80.55
Writing	2	80.55
Speaking	3	75

Table 5

The English language skills which students in KFM would need to develop from their foreign subject teachers' point of view

Language skills ranked in order of importance		% N = 7
Speaking	1	82.14
Listening	2	75
Reading	3	71.42
Writing	3	71.42

It is to be noted here that the blending of the views of both the Iraqi subject teachers and the foreign subject teachers as shown in table 3 above reflects the approximate needs of the students in KFM from the point of view of the teaching staff in the faculty at present. This assumption would imply

that though reading skills come at the lead, the other language skills should also be taken care of if the students are wanted to perform very well in their studies in the faculty as the differences among rank orders of importance would not be considered so significant.

The questionnaire has also shown that the study skills shown in table 6 would be the ones which the students in KFM would deal with during their studies in the faculty from their subject teachers point of view. Tables 7 and 8, however, show the same study skills displayed in table 6, ranked in dissimilar orders of importance as viewed by the Iraqi subject teachers and the foreign subject teachers respectively.

Table 6

The study skills which students in KFM would deal with during their study from their subject teachers point of view. (11)

Study skills ranked in order of importance		% N = 16
Laboratory report writing	1	93.75
Seminars	2	75
Note-making	3	68.75
Using library references	3	68.75
Writing medical essays	3	68.75
Writing clinical reports	4	43.75

Table 7

The study skills which students in KFM would deal with during their study from their Iraqi subject teachers point of view

Study skills ranked in order of importance		% N = 9
Laboratory report writing	1	88.88
Note-making	1	88.88
Using library references	2	77.77
Writing medical essays	3	66.66
Seminars	4	55.55
Writing clinical reports	5	44.44

Table 8

The study skills which students in KFM would deal with during their study from the foreign subject teachers point of view

Study skills ranked in order of importance		% N = 9
Laboratory report writing	1	100
Seminars	1	100
Writing medical essays	2	71.42
Using library references	3	57.14
Note-making	4	42.85
Writing clinical reports	4	42.85

As far as the difficulties the students would face in dealing with their medical materials, the questionnaire has shown that " understanding spoken English" would be the most difficult, whereas the area of medical terminology would be the least

difficult among the identified medical materials in the questionnaire as shown in table 9 below. However, "writing medical essays" was considered the most difficult from the point of view of the Iraqi subject teachers whereas "understanding spoken English" remained the most difficult from the point of view of the foreign subject teachers' point of view as shown in tables 10 and 11 respectively.

Table 9

Areas of difficulty which students in KFM would face in dealing with their medical materials from the subject teachers point of view. (12)

Areas of medical materials ranked in order of difficulty		% N = 16
Understanding spoken English	1	73.75
Answering written examinations	2	68.75
Writing essays	3	65
Understanding reading texts	4	61.25
Medical terminology	5	53.75

Table 10

Areas of difficulty which students in KFM would face in dealing with their medical materials from the Iraqi subject teachers point of view

Areas of medical materials ranked in order of difficulty		% N = 9
Writing essays	1	71.11
Understanding spoken English	2	68.88
Understanding reading texts	3	66.66
Answering written examinations	4	64.44
Medical terminology	5	57.77

Table 11

Areas of difficulty which students in KFM would face in dealing with their medical materials from the foreign subject teachers point of view

Areas of medical materials ranked in order of difficulty		% N = 7
Understanding spoken English	1	80
Answering written examinations	2	77.14
Understanding reading texts	3	60
Medical terminology	4	48.57
Writing essays	5	42.85

The results have also shown as seen in table 12 below that nine out of sixteen (%56.25) of the subject teachers were ready to co-operate with the EST teacher in order to design suitable EST courses; a result which I believe would imply a positive sign for the possibility of forming a joint committee of the specialists and ESP teachers in Iraq for developing and/or preparing effective EST courses in Iraqi science faculties. The results would also imply that team teaching⁽¹³⁾ would be feasible in the Iraqi EST situation.

Table 12

A table shows number of subject teachers in KFM who like to co-operate with the EST teacher and the kind of co-operation which could be involved

No.	Subject Teachers	Yes	No	No Comment	Kind of co-operation
1	Iraqi		x		
2	"		x		
3	"		x		
4	"	x			Irrelevant answer
5	"	x			Preparing EST programmes.
6	"	x			Studying and assessing essays.
7	"		x		
8	"	x			Irrelevant answer
9	"	x			Exchanging ideas
10	Foreign	x			Discussing students' difficulties.
11	"	x			Discussing teaching requirements.
12	"	x			No comment
13	"			x	
14	"			x	
15	"		x		
16	"	x			
Total	16	9	5	2	
%		56.25	31.25	12.5	

Presumably dissimilarities in views between Iraqi subject teachers and foreign subject teachers towards students needs and aspirations would imply that for the foreseeable future, as all subject

teachers are most likely to be Iraqis in science faculties including the faculty of medicine, emphasis would be placed on responses reflected by Iraqi subject teachers.

Indeed I tend to conceive that students' needs as reflected by the Iraqi subject teachers would more likely match the actual needs of the students in KFM from the subject teachers point of view for the following reasons:

- i) the Iraqi subject teachers would be more acquainted with the students academic and language problems than the foreign subject teachers would, as the latter work in the University according to limited contracts, probably two years or so, and thus their experience in the Iraqi students' problems would not be compared to that of the Iraqi subject teachers who have probably been teaching in the University for no less than five years, and some have been teaching for twenty years or so. Besides, most of the Iraqi subject teachers have got their first university degrees from Iraqi universities and might have undergone a similar learning situation to that of the respective students, and
- ii) Iraqi subject teachers would be acquainted with more problems faced by the students

through channels other than the classroom as the students would talk with the Iraqi subject teachers more freely and clearly about their problems through the use of the vernacular, but they may find it difficult to communicate the same problems in English to the foreign subject teachers.

4.2.8.2 Students' Questionnaire

In order to elicit information about students needs from their own point of view a questionnaire (see appendix 11) was submitted to the students two weeks after they began their medical studies so that they could be able to base their responses on experience rather than prediction. The participants were 112 in number; and they represent all the groups in the sample.

A pilot run with the first version of the questionnaire was done on two second year students in the faculty of medicine in Iraq. One of them was a student in KFM. This initial administration of the questionnaire and my discussion of the contents of the questionnaire with those students helped me to rearrange the contents of the questionnaire, clarify some ambiguously phrased questions and showed me the strong and weak points of the questionnaire. Actually the initial administration of the questionnaire helped me a great deal when I administered it later on to the relative subjects.

To start with, the questionnaire has shown that all students have stated that it was necessary for them to know English well in order to graduate in the faculty.

As far as reading skills are concerned it was clear from the results that the students did not consider themselves active readers. For example, each respondent was asked to select a response to characterise himself in regard to his reading activity as shown in table 13 below. Of the 112 students a total of 79 (70.53%) have stated that they have been facing real life difficulty in reading English (62 subjects (55.35%) selected the reply "I read with some difficulty" and 17 subjects (15.17) selected the reply "I read with great difficulty"). Only 4 (3.57%) of the 112 students claimed to read with "little difficulty". These results are especially significant in that the respondent bias is assumed to be in the direction of overstatement. Actual reading level may have been less; real conception of self as reader may have been lower as I found out later on from the results of the pre-test and when I discussed the students' language problems with the students themselves and with their subject teachers.

Table 13

Evaluation of Students' Reading Ability
from students point of view

Students' Reading Ability	N = 112 %
Fluently	3.57
Little difficulty	25.89
Some difficulty	55.35
Great difficulty	15.17

It seems, from studying table 14, that the students, when reading English related to their field of specialisation, would face nearly equal difficulties in understanding medical terminology, getting the meaning at the sentence level and grasping English at the paragraph and textual levels.

Areas of text	N = 112 %
Medical terminology	40.17
The sentence level	45.53
The paragraph and textual level	43.75

Table 14

Areas in which students in KFM face difficulty
when they read medical texts.

As shown in table 15 below, listening is seen to be the most needed skill by the students in KFM in coping with their studies in the faculty. This

result could be related to the difficulty faced by the students in coping with the new flow of medical vocabulary which students normally face when they commence a specialised course.⁽¹⁴⁾ In fact the results of this questionnaire made me put more emphasis in the course on increasing students' medical vocabulary. I also allotted more time to oral reading and explanation as well as to preview activities⁽¹⁵⁾ which I thought would help develop the students' listening skills.

Table 15

The language skills students need in coping with their studies in the faculty from their own point of view⁽¹⁶⁾

Language skills needed ranked in order of importance		% N = 112
Listening	1	74.10
Reading	2	66.07
Writing	3	56.25
Speaking	4	49.10

Finally, of the 108 students who stated in the questionnaire that they were willing to further their studies in medical related subjects after getting their first university degree, only three subjects (2 boys and a girl) claimed that they were unwilling to study in an English speaking country as shown in

table 16 below. This implies that the students were motivated to further their studies in English and this in turn would imply that they would be committed to raise their standard in English in order to cope with their assumed study abroad.

Table 16

Students who are willing to further their studies in English

%	%
willing N = 108	unwilling N = 108
97.22	2.78

4.2.8.3 Pre-EST Course Test

Before special-purpose courses are decided upon, a realistic assessment of the average of achievement in English must first be made (Stevens, 1973:230).

Presumably assessing the language ability of learners would involve taking account of what those learners need to do with the language. Therefore the repertoire most needed of the language should also be put into consideration. It seems, however, that science students would be well assessed via 'measuring tests' which are context-bound and thus would help assess the students' language repertoire relative to their field of specialisation. Those types of test

would give us an indication of how well a certain science student would go on in his/her science studies, and what particular problems in language use he/she would need to tackle (Yule, 1980:60).

Accordingly, the decision was to construct a test which would test students' ability to function in the kind of English the students would meet in their programme of study in the faculty. Since the students' respective study was based on medical texts, I decided to build the pre-EST course test around medical texts which I hoped would help me gauge just how much of medical English was already known by the students, how good their level was in English language and where their problems in English lay. Hence some texts from medical journals which deal with up-to-date and real life information were selected. Presumably those texts would help measure more communicative aspects of language use (Cummins and Swain, 1983:38).

The population in this test consisted of 93 subjects. (Those were present on the day of the test). The purpose of the test was explained to the students: to gauge their level in English relative to medical material. They were also told that the result of the test would not be taken down against them in any form, but only to help in designing a better training in English for them which would help them cope with their studies effectively,

and eventually would help them get high scores in their field of specialisation. They appeared to be very co-operative and interested in participating.

4.2.8.3.1 Test Components

The pre-EST course test consisted of four sub-tests: a listening comprehension test, a reading comprehension test, a summarising test (re-organising test), and a transcoding test (see appendix 12). The tests are briefly described below:

- i) a listening comprehension test:⁽¹⁷⁾ a text of about 100 words was read aloud to the students. It was read twice and students were required to answer a multiple-choice section of 5 items with a value of 2 marks each.
- ii) a reading comprehension test: a text of about 350 words was selected and students were directed to read more freely and carefully in search of meaning. Reading comprehension was tested by 5 multiple-choice questions to be answered with a value of 2 marks each.
- iii) a summarising test: this test was based on a reading text of about 350 words. Students were required to read the text carefully and write a 50-word summary of it, using their own words as far as possible. Marks for this test were distributed according to four items, namely clarity of thought, grammatical mastery, self-dependence, and conciseness, with a value

of 5 marks each.

- iv) a transcoding test: a text of about 50 words was devised to be read carefully and students were required to supply the deleted words of an illustration; interpretation of which depends on understanding the reading text. Ten marks were allocated to this test.

The test was to be timed; the time noted and then converted into test speed expressed in marks per minute, but students were not informed in this test about the timing of the test.

The test was then marked,⁽¹⁸⁾ the scores were collected and then computed according to SPSS programmes⁽¹⁹⁾ (see appendix 13). The performance of the experimental group and the control groups were compared. In the first sub-test, i.e. listening comprehension,⁽²⁰⁾ a comparison of the mean scores of the experimental group (henceforth, Exp. G) and each of the control groups (henceforth, Con. G.1 and Con. G.2) showed no significant difference⁽²¹⁾ as shown in tables 17 and 18. There was also no significant difference between the control groups as shown in table 19.

Table 17

Performance on the Pre-test/listening
Comparison of the Exp. G and Con. G.1

Group	\bar{x} (22)	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=34)	3.70	2.15	0.36	-0.10	Not significant at the .05 level
Con.G.1(N=25)	3.76	1.85	0.37		

Table 18

Performance on the Pre-test/listening
Comparison of the Exp. G and Con. G.2

Group	\bar{x}	S.D.	S.E.	T. Value	Level of Significance
Exp.G.(N=34)	3.70	2.15	0.36	0.51	Not significant at the .05 level
Con.G.2(N=33)	3.45	1.88	0.32		

Table 19

Performance on the Pre-test/listening
Comparison of Con. G.1 and Con. G.2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=25)	3.76	1.85	0.37	0.61	Not significant at the .05 level
Con.G.2(N=33)	3.45	1.88	0.32		

Low mean scores in tables 17, 18 and 19 would imply that the students would find listening skills a difficult area to deal with during their study in

the faculty. The results virtually agree with the results of the subject teachers' questionnaire and the students' questionnaire (see tables 9 and 15).

As far as the reading skills test is concerned⁽²³⁾ the mean scores of the experimental group and the control groups showed no significant difference when they were compared as shown in tables 20 and 21. There was also no significant difference between the mean scores of the control groups as shown in table 22 below:

Table 20

Performance on the Pre-test/reading
Comparison of Exp. G and Con. G.1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=34)	5.44	2.59	0.44	0.35	Not significant at the .05 level
Con.G.1(N=25)	5.20	2.58	0.51		

Table 21

Performance on the Pre-test/reading
Comparison of Exp.G and Con. G.2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=34)	5.44	2.59	0.44	0.33	Not significant at the .05 level
Con.G.2(N=34)	5.23	2.55	0.43		

Table 22

Performance on the Pre-test/reading
Comparison of Con. G.1 and Con. G.2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=25)	5.20	2.58	0.51	0.05	Not significant at the .05 level
Con.G.2(N=34)	5.23	2.55	0.43		

Low mean scores in tables 20, 21 and 22 would imply that the students would require their reading skills to be developed. The results seem to comply with the students needs as viewed by their subject teachers and by the students themselves in the questionnaires (see tables 3 and 13, pp.292 and 302 respectively).

As far as the third sub-test, i.e. summarising, is concerned, a comparison of students mean scores showed no significant difference between the experimental group and control groups as shown in tables 23 and 24. There was also no significant difference between the control groups as shown in table 25.

Table 23

Performance on the Pre-test/summarising
Comparison of Exp. G and Con. G.1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=33)	9.27	3.85	0.67	0.55	Not significant at the .01 level
Con.G.1(N=24)	8.70	3.74	0.76		

Table 24

Performance on the Pre-test/summarising
Comparison of Exp. G. and Con. G.2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=33)	9.27	3.85	0.67	-1.41	Not significant at the .01 level
Con.G.1(N=24)	11.15	6.55	1.15		

Table 25

Performance on the Pre-test/summarising
Comparison of Con. G. 1 and Con. G. 2

Group	\bar{x}	S.D	S.E.	T. Value	Level of Significance
Con.G.1(N=24)	8.70	3.74	0.76	-1.76	Not significant at the .01 level
Con.G.2(N=23)	11.15	6.55	1.15		

The low mean scores of the students in text summarising and my text analysis of students written discourse (see appendix 14), have given me indications that the students' communicative and linguistic performance in written medical English were very low. The mistakes I detected in scoring their summarised versions were concentrated around grammatical mistakes in using the right tense of the verb, misuse of English passivization, particularly deletion of the auxiliary verb, and the use of deviant grammatical structures which were based mainly on Arabic language structures. Most of them would have found it very difficult to give a concise summary of what they understood of the text as required in the test.

With regard to the fourth sub-test,⁽²⁴⁾ the mean scores of the experimental and control groups were compared and found not to be significantly different as shown in tables 26 and 27. It was also found that there was no significant difference between the means of the control groups either as shown in table 28.

Table 26

Performance on the Pre-test/transcoding
Comparison of Exp. G. and Con. G. 1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=34)	8.97	2.32	0.39	1.00	Not significant at the .01 level
Con.G.1(N=25)	8.28	2.95	0.59		

Table 27

Performance on the Pre-test/transcoding
Comparison of Exp. G. and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=34)	8.97	2.95	0.59	-1.04	Not significant at the .01 level
Con.G.2(N=34)	9.47	1.56	0.26		

Table 28

Performance on the Pre-test/transcoding
Comparison of Con. G. 1 and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=25)	8.28	2.95	0.59	-1.84	Not significant at the .01 level
Con.G.2(N=34)	9.47	1.56	0.26		

The high mean scores in tables 26, 27 and 28 would imply that transcoding would not be a problematic area of learning for the students in KFM. Indeed the students told me that charts, scientific conventions and drawings were not difficult areas to deal with but were of a good help for them in understanding texts and inferring meanings of considerable vocabulary. Therefore, the EST course in KFM would not emphasise the teaching of charts and diagrams via texts, but the opposite activity would be likely.

Finally, in comparing students' global performance on the 'Pre-EST Course Test' I have found that there was no significant difference between the experimental group and each of the control groups, and there was no significant difference between the control groups themselves either, as shown in tables 29, 30 and 31 respectively. I have also found that there was no significant difference in the students' speeds⁽²⁵⁾ in finishing the test among the same groups mentioned above as shown in tables 32, 33 and 34. Actually, the results shown in tables 32, 33 and 34 comply with the students' performance in English on the "Iraqi Secondary School Ministerial Examination" which shows that there was no significant difference among the three groups as shown in tables 35, 36 and 37.

Table 29

Pre-Test/Total Mean Scores

Comparison of Exp. G. and Con. G. 1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=33)	27.21	7.83	1.36	0.75	Not significant at the .01 level
Con.G.1(N=24)	25.83	5.23	1.06		

Table 30

Pre-Test/Total Mean Scores

Comparison of Exp. G. and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=33)	27.21	7.83	1.36	-0.64	Not significant at the .01 level
Con.G.2(N=32)	28.28	5.31	0.94		

Table 31

Pre-Test/Total Mean Scores

Comparison of Con. G. 1 and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=24)	25.83	5.23	1.06	-1.72	Not significant at the .01 level
Con.G.2(N=32)	28.28	5.31	0.94		

Table 32

Pre-Test/Speeds

Comparison of Exp. G. and Con. G. 1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=34)	0.89	0.12	0.02	-0.53	Not significant at the .05 level
Con.G.1(N=25)	0.91	0.13	0.02		

Table 33

Pre-Test/Speeds

Comparison of Exp. G. and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=34)	0.89	0.12	0.02	-0.39	Not significant at the .05 level
Con.G.1(N=34)	0.90	0.13	0.02		

Table 34

Pre-Test/Speeds

Comparison of Con. G. 1 and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=25)	0.91	0.13	0.02	0.18	Not significant at the .05 level
Con.G.2(N=34)	0.90	0.13	0.02		

Table 35

Students Performance in English in the

Iraqi Secondary School Ministerial Examination

Comparison of Exp. G. and Con. G. 1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=37)	82.43	9.15	1.50	-0.29	Not significant at the .05 level
Con.G.1(N=33)	83.03	7.93	1.38		

Table 36

Students Performance in English in the
Iraqi Secondary School Ministerial Examination
Comparison of Exp. G. and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=37)	82.43	9.15	1.50	-1.21	Not significant at the .05 level
Con.G.1(N=39)	84.74	7.35	1.17		

Table 37

Students Performance in English on the Iraqi
Secondary School Ministerial Examination
Comparison of Con. G. 1 and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=33)	83.03	7.93	1.38	-0.95	Not significant at the .05 level
Con.G.2(N=39)	84.74	7.35	1.17		

In order to see whether there was any correlation between the students' scores and the time they spent in finishing the 'Pre-EST Course Test' a correlation coefficient⁽²⁶⁾ (henceforth, r) between students' scores and the time each one spent in finishing the test was computed.

From the values of r in table 38 below it could be concluded that there was a weak but positive linearity between students' marks and the time they spent in finishing the test. A positive correlation,

if it was significant, would imply, however, that students who got high marks would be predicted to spend more time in finishing the test (cf.ft.26).

One theory behind the results in this correlation might be related to the assumption that the students answered the tests at their ease because they were not told that time was counted on them. But how much genuine value this claim had on the students' speeds in finishing the test would, however, be difficult to gauge. (But see table 45, p.354 where students were already told that time was counted on them).

Table 38

Correlation coefficient between students' marks and time spent in pre-test

Group	r	r^2 (27)	Relationship
Exp.G.(N=33)	0.21	0.04	Weak
Con.G.1(N=24)	0.15	0.02	Weak
Con.G.2(N=32)	0.06	0.00	Weak

4.2.9 Matching Objectives to Needs Analysis

After synthesising the results of the pre-EST course test, views of subject teachers' and students' and my own experience of the learning situation, I would be able to conclude that the specific needs of the students in KFM would be summed up as follows:

- i) reading lecture notes, textbooks, journals and other references in the students' own field efficiently and in a flexible way,
- ii) following lectures and discussions in English relative to their field of specialisation,
- iii) making notes and reconstructing them, summarising information, writing reports of the laboratory work they have done and preparing scientific essays,
- iv) understanding quizzes and examination questions and writing appropriate answers, and
- v) taking part in classroom interaction, group work discussions and tutorial classes.

I should mention here that a minimum of the vernacular might be used in all or some of the mentioned activities above, but this would be done by the subject teachers in a very restricted situation, probably in the first and second year of study in the faculty. This, actually, should not be taken as an excuse to eliminate the EST course in the faculty of medicine in Iraq, on the contrary, it would be a plausible indication that the EST course in this faculty should be properly rectified to help raise students' level in scientific English in order to cope with their studies in the faculty. Indeed needs analysis would not be pinned down by the present needs of the students, but it would take

into consideration aspirations of the educational fraternity for the development of the learning situation which should go in line with the political aspirations in the country concerned.

In matching objectives to students' needs it was decided that developing students' reading skills would be given the first priority. Actually, in terms of the language skills, the students' needs would be ranked in decreasing order of importance as reading, listening, writing and speaking in order to survive within the educational framework of the faculty. In practice, though the EST course was originally directed towards developing reading skills, reading skills would be integrated with other language skills via related classroom activities particularly through group work techniques. In effect, isolating reading skills from other language skills might cripple attempts at more global communication. Indeed "Communicative competence demands integration and combination of language skills" (Edelhoff, 1981:54).

As far as study skills are concerned it seems clear from the information gleaned about students' needs that the EST course would be concerned with the following study skills:

- i) training students in note-making and note-reconstruction.

- ii) training students in reference using, and
- iii) helping students to be acquainted with laboratory report writing.

With regard to developing students' linguistic performance, students' needs analysis has shown that students would be in need of increasing their medical vocabulary including medical terminology (see 4.2.11.3), drawing students' attention to logico-grammatical words, and training students to deal with English in the field of specialisation at the discoursal and textual levels (see 4.2.11.2). Certainly the results of the pre-EST course test, and questionnaire would be the basis on which EST exercise materials are to be prepared, but this assumption will be open to negotiation while the EST course is in application and experimentation (cf. Allwright and Allwright, 1977:59) as real classroom application would reveal so many hidden gaps which would require immediate and relevant treatments.

In terms of the aforementioned views, the communicative needs profile of the participants and the EFL situation would look something like the following information which is based on Munby's model (see Munby, 1978:52):

1. Participant
 - 1.1 Identity
 - 1.1.1 Age: minimum 17, maximum 22, mean 18
 - 1.1.2 Sex: male and female, considerable majority male.
 - 1.1.3 Nationality: Iraqi
 - 1.1.4 Place of residence: Kufa, Iraq
 - 1.2 Language
 - 1.2.1 Mother tongue: Arabic
 - 1.2.2 Target language: English
2. Data Collection
 - 2.1 Previous experience of the learning situation
 - 2.2 Study of the existing EST materials in the faculty.
 - 2.3 Study of the syllabuses of the students' specialised materials.
 - 2.4 Questionnaires ("professors' version" and "students' version").
 - 2.5 Pre-EST course test.
 - 2.6 Classroom observations
 - 2.7 Continuous tests and assessment
 - 2.8 Discussions with students, staff and administrators.
3. English language communication needs profile
 - 3.1 Present level: Iraqi preparatory school leavers/scientific section (see table 71 p. 401).

3.2 Educational purpose:

3.2.1 specific discipline: Medicine

3.2.1 level: undergraduate

3.2.2 degree: MBChB (Bachelor of
Medicine and Surgery)

3.2.2 central areas of study

3.2.2.1 Anatomy

3.2.2.2 Physiology

3.2.2.3 Histology

3.2.3 Other areas of study

3.2.3.1 Biochemistry

3.2.3.2 Physics

3.2.3.3 National Education (in
Arabic language)

4. Setting

4.1 Place of study: faculty of medicine

4.2 Study setting where English is required

4.2.1 classroom

4.2.2 laboratory

4.2.3 library

4.2.4 private study at home or university
flats.

5. Social Relationship

5.1 Student to teacher

5.2 Non-native to non-native

5.3 Adult to adult

5.4 Dialect: British English and American English with Arabic and Indian accents; mostly Arabic accent.

6. Communicative Events in English

6.1 Main event

6.1.1 reading skills

6.1.1.1 medical students reading intensively for all the information in the teachers' notes.

6.1.1.2 reading to find the main information in medical English textbooks, supplementary books and manuals.

6.1.1.3 reading current medical literature in own related field in English and Arabic in order to keep abreast with latest developments in the relevant field of study.

6.1.1.4 developing note-making strategies to reading skills.

6.1.2 listening

6.1.2.1 listening to lectures and results of laboratory experiments in English.

6.1.2.2 making notes relative to listening skills.

6.1.3 writing

6.1.3.1 developing note-reconstructing strategies.

6.1.3.2 answering written examinations in English.

6.1.3.3 writing laboratory reports

6.1.3.4 preparing seminars, essays and tutorials as they advance in their studies.

6.1.4 speaking

6.1.4.1 participating in classroom discussion.

6.1.4.2 talking about laboratory experiments.

6.1.4.3 dealing with seminars and tutorials as they advance in their studies.

Presumably the depth of competence in medical English increases as students progress through their specialised studies. The aim of the experimental EST course in KFM is to help students develop reading skills which would help them develop conceptual abilities to cope with their field of specialisation effectively. Study skills relative to reading skills are integrated with reading skills as well.

4.2.10 Preparing Tentative Practice Exercises for the Experimental Group

Given the limited language experience in both linguistic structures and medical knowledge the students have had, the approach adopted in exercise construction for the experimental group was mainly concerned with helping students to reinforce and expand their present knowledge of their chosen subject as that type of material would "motivate the students to the greatest extent" (Fortune, 1979: 45). The approach also aimed at developing students' conceptual and psychological abilities by putting students in situations whereby they would practise solving new language and content problems. The practising materials also aimed in part at closing the gap between the students' English and that required for the reading of medicine. Therefore emphasis in those exercises was placed on the cohesive aspects of continuous discourse (see appendix 6).

It would seem to be sensible to design language teaching courses with reference to use. This does not mean that exercises in particular aspects of usage cannot be introduced where necessary; but these would be auxiliary to the communicative purposes of the course as a whole and not introduced as an end in themselves (Widdowson, 1978:19-20).

Presumably, reading skills would be developed in the context of a variety of types of reading, reading exercises and reading assessment. Students would also use various strategies and skills when reading (Morrow, 1980:2). Therefore students would best be trained to deal with different types of exercises as variation of approach would help to cater for students' individual requirements.

The language of the exercises is presented in a way whereby medical information would be recycled and reinforced. From the very first exercise, the aim is to present medical materials at discorsal and textual levels in order to emphasise the assumption that language is actually used to express relationships between pieces of information at a more global sense. The idea of supporting information through the use of diagrams, drawings, etc. is also reflected in the practising materials. The practising material also involved translation exercises. There is consensus (see, for example, Titford, 1983:56) that the use of translation in communicative teaching has shown its usefulness with advanced students, particularly when the target language is taught in L1 situation. This would be related to the problem-solving nature of translation which would help students make an immediate productive use of what they have just learnt by

providing them with communication interactive exercises based on the translation text.

Practising materials also involved anaphoric and cataphoric references, as those items would be essential for the interpretation of a text since questions on anaphoric devices would refer the student back to the close scrutiny of the text (Halliday and Hasan, 1976:206).

Asking questions, which is part of the practising material, would be a good type of language exercise for extracting specific information from scientific texts. From a research done by Friederichs and Pierson (Friederichs and Pierson, 1981:410) it was found that question patterns beginning with "Discuss, Explain, List, Describe, Give reasons, Define, etc." are what students of science would actually need to do when they deal with the language of science in a target language.

To sum up, the exercises adopted were carried out through various types of questions intending to highlight the reading-text contents which would develop students' reading skills and reading competence and would help integrating reading skills with other language skills.

It is to be mentioned, however, that the practising materials were open to modification while the course was going on in order to design a more

appropriate course.

4.2.11 Presentation and the Teaching Method

In the teaching and learning and methodology of a foreign language, it is only activities within the syllabus and methodology that can be classed as communicative (Jeremy, 1982:165).

The teaching method adopted was one which recognises that learning a foreign language would involve an understanding of how students use their linguistic attainments within textual levels in order to communicate and make them aware of the way medical English is used in written communication and thus help them develop techniques of reading skills which would build in them an ability to integrate the four language skills. However, the teaching approach adopted involved the following tasks:

4.2.11.1 The Teaching of Reading Skills

Task 1: This was a gist-listening activity. It involved reading aloud with explanation by the teacher. The students had to listen carefully and understand what was being read aloud. Notes could also be made.

Task 2: This task involved oral discussion of retrieved information. Students were required to discuss previous reading materials in class, make comments and retrieve gleaned information.

Those exercises would help students gain self-confidence as they already knew what they were going to talk about.

Task 3: This task required note-making skills. Students had to deal with exercises which required them to write notes, make lists, translate paragraphs and fill in missing items about what they understood from reading certain sections in the text. The exercises involved activities which would require students to go back and read the text again in order to give accurate answers. In a following teaching unit this gleaned information would be used as a feedback for oral discussion.

Task 4: This task involved a problem solving activity in group-work techniques. Students were required to speed-read and search-read identified paragraphs of reading texts. The reading text was distributed among the groups of the class so that when discussed it would form one united topic. The members of each group had to read their specified paragraph, discuss it and exchange ideas with peers in a group-work activity. Students could ask the teacher for clarification and meaning of new words.

The students were also asked to deal with 'information gap' activities (see p.119 in this dissertation) in diagrams of organs of the human body with incomplete information, some diagrams to be completed. Other tasks required students to comment on the functions of some organs of the human body (see, appendix 16 which contains the exercises and appendix 16a which contains the answers to the exercises).

The size of each group was only six students. The groups were divided according to the order of the students in the class list. However, it was found that each group included students of mixed abilities where better students would help the weaker (Byrne, 1973:12). Thus no change was required to rearrange members of the groups. Groupwork, however, did not involve any rearrangement of furniture since classroom arrangement did not permit such a rearrangement, but students were arranged to cope with the activity with minimum fuss.

I have noticed that the students were active and experiencing a new aspect of pedagogy in group work activities. It seemed it would be the first time that students felt that emphasis was placed on them as performers and not as passive spectators. The process of learning would have looked meaningful and motivating as well as challenging as learners were

not given something ready-made to be consumed by them then and there; they were encouraged to work for it and find their way about on their own.

The students were made aware during those groupwork activities that there was no one interpretation for what they read but there were various possibilities of taking different routes in discussing the text in question. The students appeared very much interested in groupwork activities. I have noticed that a high level of self-confidence was developed in the students of the experimental group, and that would be clear from observing their classroom discourse which I have recorded at the end of the EST course (see appendix 21).

Task 5: This involved speed-reading, skimming and scanning for topic. Students were told how to read fast, skip difficulties, not to pay too much attention to unfamiliar vocabulary, try to get the meaning from the context without referring to the dictionary if they could possibly manage without it, but look up for information if they were really interested in familiarising themselves with it.

Actually all the students in both the experimental group and control groups were encouraged to increase their reading speed of their medical subjects while maintaining their accuracy, but it was only the students in the experimental group

who were given practice in speed reading as follows:

- i) overhead projector was used to help students increase their reading speed. Samples at the discourse level were selected from the students' medical textbooks. Students were required to read and understand what was shown within a very short span of time. Then students were required to reflect ideas of what they have read or seen on the screen (see appendix 17 for samples of material used),
- ii) students were also told to keep a record of their reading speeds and monitor their own reading speed at home. Type of reading materials, name of the text, length of the text, and time spent were to be pointed out in the record, and
- iii) students were also timed when they were told to read texts for groupwork discussions.

It is to be mentioned that throughout the course, students were encouraged to deal with texts as integrated units. Emphasis was placed on individual or self-dependent reading. Indeed I found it useful for me and the students to discuss with them outside classroom hours what they have been able to understand and retrieve of their homework reading (see 4.2.12.3).

4.2.11.2 The Teaching of Study Skills

The teaching of study skills covered the following:

4.2.11.2.1 Note-making and Note-reconstruction



The teaching of note-making dealt with the following areas (Dudley-Evans, 1977:39):

- i) Elimination of grammatical materials which do not affect meaning such as articles, auxiliary verbs, etc.
e.g. The alimentary canal is the part of the body where food is digested. (in alimentary canal food digested).
- ii) Rephrasing and re-ordering information as in changing a complex ideas into a single lexical item.
e.g. The use of "Polio" for "Poliomyelitis" (the inflammation of the grey matter of the spinal cord).
- iii) Conventional abbreviations (including subject-specific abbreviations,
e.g. The use of "G.I.T." for "gastrointestinal tract".
- iv) Symbolic representation of logical relationship within text. Each relationship was presented in isolation, and then practised within sentence level in case of the control groups and discourse levels in case of the experimental group.

The students were also encouraged to make use of the following symbols in diagram 29 which is cited by Dudley-Evans (ibid):

Diagram 29

Symbolic representation of
logical relationship with text

Relationship	Symbol	Exponents
Cause and effect		'causes' 'results in' 'leads to' 'is caused by' 'results from' 'raises' 'causes' 'a rise in' 'lowers' 'causes a reduction in'
Consequence	\therefore	'therefore' 'thus' 'as a result'
Contrast	b	'but' 'however' 'on the other hand'
Equivalence	$=$ \neq \approx	'is the same as' 'equals' 'is not the same as' 'is approximately equal to'
Correlation		'correlates with' 'is proportional to' 'does not correlate with'
Class inclusion	\supset \in	'includes' 'is a member of'

The teaching of note-making also involved practice in making notes from the reading texts.

'Note reconstruction' concentrated on restoring deleted elements. Sometimes I found it necessary to teach relevant remedial grammatical materials, particularly those related to English sentence patterns, passive constructions and discourse connectors in order to ensure the students got things right. The teaching of note-reconstruction involved restoring notes already made at the sentence level and discourse level to full forms.

4.2.11.2.2 Laboratory Report Writing

The students had no experience in laboratory report writing in English. They, however, have experience in laboratory report writing in Arabic. Therefore emphasis was placed on training students how to produce reports of the experiments carried out in the laboratory by the science specialists, together with tabulation of results and observations. During the EST course students were given practice in report writing and model reports were discussed. Emphasis in model reports was placed on language of description and instruction. Therefore two areas were emphasised in the practice, namely 'aim' and 'procedure' as shown in the example below.

Examples of laboratory report⁽²⁸⁾

e.g. 1: Look for the following substances in saliva

i) chlorides

- a) Aim: The aim of this experiment is to look for chlorides in saliva.
- b) Procedure: Add 2 drops of saliva to a drop of concentrated Nitric Acid and 2 drops of Silver Nitrate solution. A white precipitate indicates the presence of chlorides in the saliva.

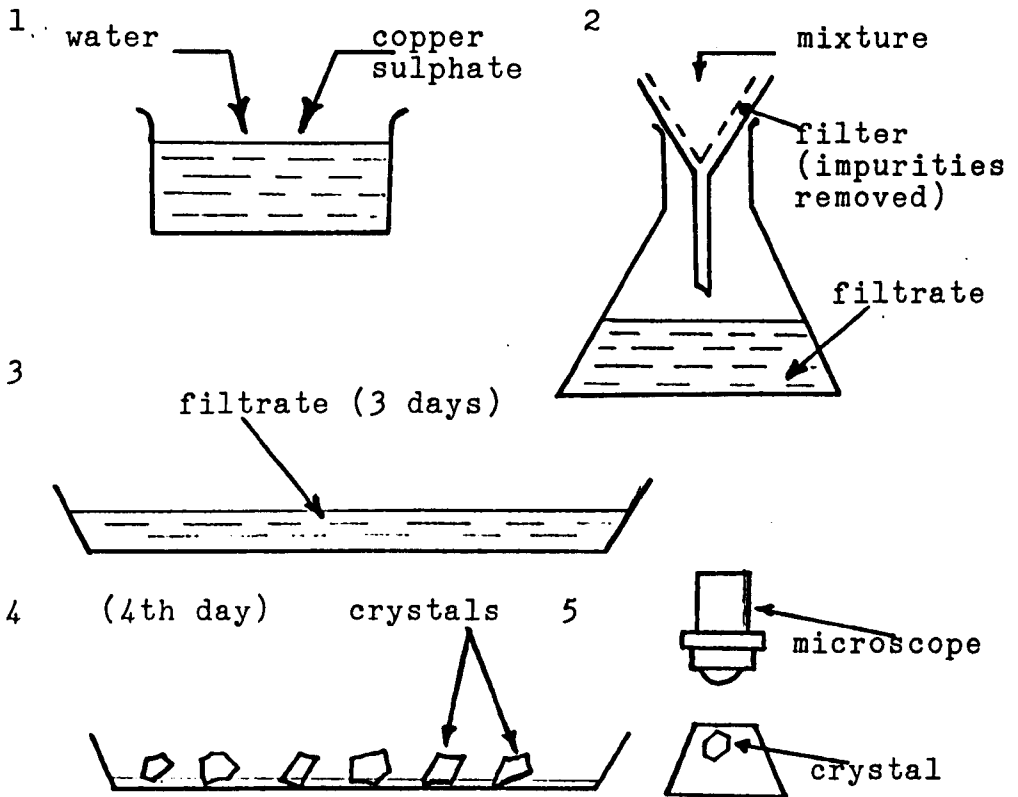
ii) sulphates

- a) Aim: The aim of this experiment is to look for sulphates in saliva.
- b) Procedure: Acidify 2 drops of saliva with a drop of concentrated HCl, a white precipitate indicates the presence of sulphates.

iii) phosphates

- a) Aim: The aim of this experiment is to look for phosphates in saliva.
- b) Procedure: To 5 drops of saliva add one drop of HNO_3 concentrated to 0.5 ml. of ammonium molybdate reagent and warm the mixture. A yellow precipitate indicates the presence of phosphates.

e.g. 2: Write a short paragraph describing how the following experiment (Copper Oxide) was carried out. (After Kennedy and Hunston, 1982:38).



4.2.11.2.3 Reference Using

Students were taught how to look for relevant references. They were trained how to state author's name, date of publication, title, publisher, editions, and place of publication. Volume numbers and pages should also be identified in case of journals.

Then I took the students to the library, and by the help of the librarian who talked about the facilities available in her library, I showed

them how to make use of the library facilities, use indexes, bibliographies and how to borrow references, medical dictionaries, journals, etc. I called upon some of them to practise before others how to look for certain medical information according to 'subject headings' as that seemed to me what they needed most during their studies and when they dealt with essays and seminars. They did well, however, and appeared quite interested in finding their own information without the help of the librarian.

4.2.11.2.4 Short Essay Writing

Students were trained to write scientific essays. Information related to how to arrange the sections of a scientific essay such as introduction, main body, conclusion, suggestions and use of references was thoroughly discussed with the students. Then the students were required to submit a one-thousand word essay which should deal with one of the following topics:

- i) digestion or gastrointestinal tract
- ii) breathing or respiratory system, and
- iii) bacteria or bacteriology.

Students were taught how to deal with relative data from medical books and journals in the library. The short essays they submitted after a month were mainly formed of collected materials. One aim behind writing those essays was to train students to "move from teacher-supplied data to student-collected data" (Hill, et al, 1982:333).

However, students submitted their essays which were well-organised and with extensive and relevant data, but with very little description and analysis on their part. This would imply that the students at that stage of their study would not be competent enough to deal with essay writing.

4.2.11.3 Increasing students' medical vocabulary

Presumably increasing students medical vocabulary, particularly those related to names of parts of the body, diseases and drugs, would help students a great deal in guessing the meaning of the context (cf. Clarke and Nation, 1980:212). Key words of each teaching unit were grouped and students were required to supply their meanings in the vernacular according to their occurrence in the context. Emphasis was also placed on pronunciation of those words. I also found it essential to teach students how to use a medical English-English dictionary, and how to look up words and check their pronunciation. Students, however, were already familiar with the symbols of the International Phonetic Alphabet from their secondary school studies (see Al-Hamash, 1978: 42), but they were not trained how to use English dictionaries for private study. I have found out that this learning activity has enlarged students' medical vocabulary span. The students told me that

the use of the English-English dictionary has helped them a great deal in their private study at home and has increased their knowledge of the medical concepts they dealt with in their textbooks.

4.2.11.4 The Teaching of Terminology

Although professors' and students' questionnaires (see tables 9 and 14, pp. 296 and 302 respectively) have shown that medical terminology was one of the language components which students in KFM would require, I thought I should not be very much concerned with teaching medical terminology as that would require teaching the meaning of lexical items which would require mastery of medical concepts which would most conveniently be the task of the subject teachers, since they use English as a language of instruction (Own, 1973:11). However, from discussing students language problems with the Dean of the faculty, and with the students themselves I was convinced that the EST course would better include the teaching of terminology. Therefore, I began to make use of the information presented in the reading texts to teach relative terminology as if they were part of the texts. Consider the following examples: (30)

- itis = inflammation

e.g. 'tonsillitis' means inflammation of the "tonsils".

'tracheitis' means infection of the tracheal membrane.

This section also covered the teaching of related English affixes of Latin and Greek origin (see Appendix 2).

To conclude, the design of the teaching approach adopted with the control groups covered the following items:

- i. reading aloud by the teacher with explanation.
Students listen.
- ii. reading aloud by students. The teacher corrects pronunciation and grammatical mistakes on the spot. Students repeat correct forms after the teachers.
- iii. silent reading by students.
- iv. asking students oral questions to gauge their comprehension of the text. Emphasis is placed on teacher-student interaction. Student-student interaction is not allowed.
- v. practising note-making and note-reconstruction techniques.
- vi. dealing with scientific terminology.
- vii. practising reference skills and short essay writing as the experimental group did.
- viii. training how to speed-read scientific texts. Students were told to keep a record of their reading speeds at home, but they did not practise speed-reading activities with the overhead projector as the experimental group did (see p. 332).
- ix. all teaching hours were 'frontal teaching' None were conducted in group work technique.

However, the design of the teaching approach adopted with the experimental group could be summed up as follows:

- i) offer reading comprehension practice via series of connected medical texts, particularly texts related to anatomy and medical physiology because those would be the most relevant topics to medical students in their preliminary year,
- ii) provide short and varied activities of reinforcement and problem-solving nature in order to provoke discussion and build self-confidence,
- iii) relate aural and visual comprehension practice through reading aloud with explanation as well as asking students to read aloud in class,
- iv) practise note-making and note-reconstruction techniques,
- v) practise laboratory report writing,
- vi) deal with medical terminology and scientific affixes,
- vii) practise the use of library references for the sake of developing organisational skills via short essay writing, and
- viii) practise speed reading activities.

4.2.12 Evaluation While the Course is in Application

Presumably an important consequence of teaching and supervising a course would be to gather information which would lead to the development of the materials and the teaching techniques. The teaching

activities and the course materials were under constant revision on the basis of students' feedback, including information obtained outside class hours as to what students felt to be their language problems while the course was going on. I have found that information related to the effectiveness of particular teaching techniques and information obtained from the subject teachers observing students in classroom interaction were also of vital importance for the development and rectification of the course while it was in application.

4.2.12.1 The Academic Atmosphere

I understood from the subject teachers that they were not satisfied with the students' academic level, particularly their level in English. On the other hand the students felt that most of the subject teachers spoke too fluently for them to follow. They also complained that they were being overloaded with too much materials to be grasped and prepared. Actually, this seemed to happen nearly at the beginning of every academic year. Presumably the gap between students' academic and English language levels in secondary schools and those required at the faculty of medicine in Iraq would be the cause.

Actually, though the students seemed to me better than their colleagues whom I taught in 1979-80 in standard and motivation, their level in

English was not up to the standard which would be required in the faculty of medicine. The subject teachers, however, expected their students to cope with the medical materials from the first weeks of the students' medical studies. Presumably their expectations are based on a false conception that the students being exposed to eight years of English courses at pre-university level (see 5.1.2.2.1) should be able to cope with the new situation in the faculty which is English medium. Actually there was not very much that could be done immediately to convince the lecturers that those students were thrown in a new educational world where they were simultaneously under the pressure of lack of adequate linguistic attainment in scientific English to cope directly with the new learning situation, and a need for adaptation to the mixed-sex educational situation⁽³¹⁾ and new accommodation. It might be the first time those students lived in a university boarding house - away from their parents - and one would imagine how much impact this factor would have on them, probably due to their social environment where child-parent relationship is emotionally strong and interdependent as the one in Iraq where Arabic and Islamic traditions still dominate the social scene.

As far as students' claim that they were taught by too fluent subject teachers, one can discern that

those teachers, being trained in English speaking countries, would be considered fluent in comparison to the students' secondary school teachers of English who have been trained only in EFL situation. However, when there was an Indian or a Pakistani subject teacher in mind, accent would presumably be added to the English learning load.

From what the subject teachers said I gathered that the students were mainly hindered by medical vocabulary in the first weeks of the course.

However, the learning load, of course, would be heavy in the faculty of medicine in comparison to the students' secondary-school learning load. But the subject teachers had a syllabus to complete within the academic year and this syllabus, as everyone teaching in the faculty of medicine would know, is linked hierarchically with other syllabuses in the medical educational ladder. Therefore, as it has been rightly argued by Brumfit (Brumfit, 1983), students should be committed to the learning task as their teachers do.

4.2.12.2 Classroom Observation

The teacher in the act of teaching has spent, perhaps, many hours noting the successes and failures of his students in their attempts to use English. These many hours would, in effect, provide

the basis for the teacher's ratings. A student can hardly be expected to show more about his abilities in an hour of formal testing (ibid). As Pumfrey (Pumfrey, 1977:44) suggests, classroom observation may lead to a better appraisal of learners' abilities than does a standardised test.

To begin with I have noticed that the students' standard in English was generally low. However, most of the students were eager to improve and apply what they knew. They responded readily to the language learning activities, namely note-making, report writing and group work techniques. Those activities, as students claimed, were novel to them. Relations between students and myself were generally good. I believe that this has contributed a great deal to students' motivation towards the EST course.

I have inferred from students' interaction that they had difficulty in separating what is essential from non-essential in a text. This probably would lead them in turn to face difficulty in deciding on relevant notes to pick up for future reference. I have also noticed that most of the students faced difficulties in the following:

- i) thinking out an argument using evidence
- ii) thinking and writing critically, and
- iii) participating in oral discussions or in answering oral questions, particularly when the answer requires more than one short sentence.

I have noticed that students of the experimental group were interested in the material. But most of the students of the control groups were interested only in the medically related topics of the textbook, namely "Atomic Radiation and Life" and "Banting and the Discovery of Insulin" (see p. 285). Some of the students of the experimental group began to use medical terms of Latin origin, particularly in the final EST term test. What attracted my attention is that those terms, namely 'osteocytes'- bone cells, 'axilla' - armpits, and 'compact tissues' - hard bone⁽³²⁾ were not part of the material I taught in the EST course. This would imply that students of the experimental group began to feel the relevance between the EST course and their field of specialisation.

4.2.12.3 Discussing Students' Problems Outside Class Hours

In order to gain more information about which aspects of the study caused most difficulty to students. I told them that I was ready to discuss their language problems outside English class hours. Many students of both the experimental group and control groups turned out for advice. I also discussed students' language problems with their subject teachers - the Iraqis and foreigners. I concluded, however, that the general feeling is that English is immediately important to the students to understand their field of specialisation. The general attitude to English as far as students are

students' interest in their chosen field of specialisation was genuine. However, via contacts with students and subject teachers outside class hours, I have come out with the feeling that students:

- i) were vocationally aware and committed to their perceived spectrum of studies,
- ii) have accepted the English-medium nature of their textbook and instructions,
- iii) appreciated the relevance of the EST course in their faculty programme but they were not satisfied with the timing and the length of the course (see also table 66 p.370).
- iv) had the feeling that speaking English among doctors in hospital is still considered prestigious.

On the other hand, students have told me that they were facing difficulties in the following areas:

- i) planning and organising time to meet work deadlines, and do the reading and work expected by their subject teachers,
- ii) extracting relevant information from reading their medical subjects and retrieving them later on in class,
- iii) following subject teachers in making notes in class,
- iv) writing up notes made in class, or notes made during practical and experimental sessions,

- v) writing essays and dealing with tutorials or seminars, and
- vi) organising their thoughts when they speak in class and finding the semantically exact words to express themselves.

4.2.12.4 Continuous Assessment

The assessment of students' performance during the course consisted of two reading comprehension tests, a term test and analysis of students' recorded spoken discourse.

The net number of subjects who participated in the tests were 39 in the experimental group, 34 in the first control group and 41 in the second control group, as from the experimental group two subjects were excluded: a girl transferred to another faculty and a boy who was absent from most of the English hours but attended only one test. Therefore the subjects who were under study in the experimental group were 39: 14 girls and 25 boys. From the first control group three subjects were excluded: a boy who transferred to another faculty, a second one left his study in the faculty, and a third one who was absent from most of the English hours, but attended only the pre-EST course test. Therefore the subjects who were under study in this group were 34 students only: 4 girls and 30 boys. From

the second control group two male students were excluded. The first was ill in hospital during the period of the course, and he did not attend any test. The second one was a student repeating the year. Therefore the subjects under study in this group were 41 students: 10 girls and 31 boys.

4.2.12.4.1 Reading Skills Tests

4.2.12.4.1.1 First Reading Skills Test

This test involved a text chosen from the students' medical textbook⁽³³⁾ (see appendix 18). The text contained factual and informative material dealing with the anatomy and physiology of the lungs. The reading comprehension questions used in the test intended to test whether the students can grasp suggested or implied meaning, evaluate form and detail, and make a prediction based on the content of the text. The test was conducted approximately at the end of the first half of the period of the EST course. The students were made aware that the time for this task was limited. Reading comprehension was tested by five multiple-choice questions to be answered with a value of two marks each.

The test was then marked, the scores were collected⁽³⁴⁾ and then computed. A comparison of the mean scores⁽³⁵⁾ of the experimental group and each

of the control groups in reading comprehension showed no significant difference as shown in tables 39 and 40. There was no significant difference between the control groups either as shown in table 41.

Table 39

First Reading Skills Test

Comparison of Exp. G. and Con. G. 1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=37)	8.97	1.38	0.22	1.09	Not significant at the .05 level
Con.G.1(N=29)	8.55	1.76	0.32		

Table 40

First Reading Skills Test

Comparison of Exp. G. and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=37)	8.97	1.38	0.22	0.70	Not significant at the .05 level
Con.G.2(N=39)	8.71	1.74	0.28		

Table 41

First Reading Skills Test

Comparison of Con. G. 1 and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=29)	8.55	1.76	0.32	-0.39	Not significant at the .05 level
Con.G.2(N=39)	8.71	1.74	0.28		

As seen in tables 42 and 43, a comparison of students' reading speeds showed that, although the mean of the experimental group was higher than that of each of the control groups, it was statistically insignificant. There was also no significant difference between the means of the control groups as shown in table 44.

As far as the correlation coefficient between the marks students' scored in the reading skills and the time they spent in finishing the test is concerned, it was found that it was weak and positive as shown in table 45. This would, imply, however, that there was some indication, though weak, that students who got high marks in the test would still tend to spend more time in finishing the test although they were aware that the time for this task was limited.

The aforementioned argument would imply that the students might have not been trained to sit for 'speed tests',⁽³⁶⁾ during their pre-university education. Indeed Iraqi school and General Ministerial Examinations at pre-university level would be categorised as 'power tests'.⁽³⁷⁾ From experience in teaching English in Iraqi secondary schools for ten years, I know that although most able students could finish within approximately one hour in the case of the General Ministerial Examinations, and 40 minutes in the case of

secondary school examinations, the examination time limit is three hours for the former and two hours for the latter.

Table 42

Reading speeds in the first reading skills test
Comparison of Exp. G. and Con. G. 1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=37)	0.99	0.36	0.05	2.03	Not significant at the .01 level
Con.G.1(N=29)	0.84	0.24	0.04		

Table 43

Reading speeds in the first reading skills test
Comparison of Exp. G. and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=37)	0.99	0.36	0.05	1.90	Not significant at the .01 level
Con.G.2(N=39)	0.86	0.20	0.03		

Table 44

Reading speeds in the first reading skills test
Comparison of Con. G. 1 and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=29)	0.84	0.24	0.04	-0.42	Not significant at the .01 level
Con.G.2(N=39)	0.86	0.20	0.03		

Table 45

Correlation coefficient between the students' marks and time spent in the first reading skills test

Group	r	r ²	Relationship
Exp.G.(N=37)	0.19	0.03	Weak
Con.G.1(N=29)	0.04	0.00	Weak
Con.G.2(N=39)	0.08	0.00	Weak

However, a comparison of students' mean scores in 'reading speed' and 'reading comprehension', which were measured for the same period of time after the commencement of the EST course, may imply that 'semi-mechanical skills', so to speak, such as reading speeds would be considerably quicker to train in the students than 'conceptual skills' such as 'reading comprehension'. This, however, would be related to the English language teaching approaches adopted in Iraq which might emphasise the mechanical elements of the learning process rather than conceptual ones.

4.2.12.4.1.2 Second Reading Skills Test

This test was administered at the end of the EST course. It involved a text of about 100 words dealing with details of a medical prescription for a quick relief of acid indigestion. (See appendix 19). Reading comprehension was tested

by four multiple-choice questions to be answered with a value of two and a half marks each. Students were made aware that the time for this task was limited.

The papers were then marked, and the scores⁽³⁸⁾ were computed. The results showed that the mean⁽³⁹⁾ of the experimental group was significantly higher than that of each of the control groups in reading comprehension as shown in tables 46 and 47. It was also found that there was no significant difference between the means of the control groups as shown in table 48.

Table 46

Second reading skills test

Comparison of Exp. G. and Con. G. 1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=38)	8.22	2.39	0.38	2.23	Significant at the .05 level
Con.G.1(N=32)	6.95	2.35	0.41		

Table 47

Second reading skills test

Comparison of Exp. G. and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=38)	8.22	2.39	0.38	2.25	Significant at the .05 level
Con.G.2(N=37)	6.89	2.72	0.44		

Table 48

Second reading skills test

Comparison of Con. G. 1 and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=32)	6.95	2.35	0.41	0.10	Not significant at the .05 level
Con.G.2(N=37)	6.89	2.72	0.44		

As far as reading speeds are concerned the results showed that the mean speeds of the experimental group was significantly higher than that of each of the control groups as shown in tables 49 and 50. There was, however, no significant difference between the means of the control groups as shown in table 51.

Table 49

Reading speeds in the second reading skills test

Comparison of Exp. G. and Con. G. 1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=37)	2.25	1.23	0.20	3.36	Significant at the .01 level
Con.G.1(N=32)	1.46	0.66	0.11		

Table 50

Reading speeds in the second reading skills test

Comparison of Exp. G. and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=37)	2.25	1.23	0.20	3.80	Significant at the .01 level
Con.G.2(N=37)	1.42	0.51	0.08		

Table 51

Reading speeds in the second reading skills test
Comparison of Con. G. 1 and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=32)	1.46	0.66	0.11	0.33	Not significant at the .01 level
Con.G.2(N=37)	1.42	0.51	0.08		

From the values of r in table 52 below it would be concluded that there is a satisfactory correlation with a negative slope (see ft. 26) between the marks of the students of the experimental group and the time they spent in finishing the test. This, in effect, implies that students who got high marks in the test would tend to spend less time in finishing it. This actually is an inverse prediction, not a direct one. There is, however, weak but negative correlation between the marks which the students of the control groups got and the time they spent in finishing the test.

Table 52

Correlation coefficient between students' marks and the time spent in the second reading skills test

Group	r	r^2	Relationship
Exp.G. (N=37)	-0.53	0.28	Satisfactory
Con.G.1(N=32)	-0.06	0.00	Weak
Con.G.2(N=37)	-0.11	0.01	Weak

From the results of the 'second reading skills test', it may be concluded that the experimental group has benefited more than the control groups from the training scheme adopted in both reading skills and reading speed activities.

4.2.12.4.2 EST Term Test

The term test was conducted a week before the end of the course. It consisted of three parts: a ten item true/false questions part with a value of ten marks, a sentence and discourse completion part with a value of five marks, and writing a 50 word account on one of three topics related to the students' reading materials with a value of five marks (see appendices 20 and 20a).

Students' papers were collected, then scored⁽⁴⁰⁾ and computed. Comparison of results showed that the mean scores⁽⁴¹⁾ of the experimental group was significantly higher than that of each of the control groups as shown in tables 53 and 54. It was found, however, that there was no significant difference between the mean scores of the control groups as shown in table 55.

Table 53

Students' performance on the EST Term Test
Comparison between Exp. G. and Con. G. 1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G(N=39)	16.53	1.68	0.269	4.64	Significant at the .01 level
Con.G.1(N=34)	14.64	1.79	0.309		

Table 54

Students' performance on the EST Term Test
Comparison between Exp. G. and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=39)	16.53	1.68	0.26	4.47	Significant at the .01 level
Con.G.2(N=41)	14.68	2.01	0.31		

Table 55

Students' performance on the EST Term Test
Comparison between Con.G. 1 and Con.G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=34)	14.64	1.79	0.30	-0.08	Not significant at the .01 level
Con.G.2(N=41)	14.68	2.01	0.31		

Therefore, the results of the 'EST Term Test' may imply that both the experimental group and the control groups have benefited from the EST course, but the experimental group would have gained more than each of the control groups. The difference in students' performance would be attributed to the training schemes adopted and the material used in each group. The aforementioned arguments seem to comply with students' ideas reflected in their last questionnaire (see, particularly, table 58, p. 363) and with the analysis of students' spoken classroom discourse as shown in (4.2.12.4.3).

4.2.12.4.3 Sample of the Participants' Classroom

Spoken Discourse

A week before the end of the EST course I recorded the participants' classroom interaction, (42) The data later on was analysed on two bases: students' language performance and their willingness and ability to participate in the interaction. This controlled recording attempted to shed more light on the participants' level in English.

Actually I have found that both the experimental group and the control groups face the following grammatical difficulties in English:

- i) deviant use and incorrect deletions of prepositions.
- ii) incorrect deletion of the 3rd person singular s morpheme.
- iii) misuse of the past simple tense
- iv) students being possessed by mental translation from Arabic into English.
- v) misuse of definite and indefinite articles
- vi) pronunciation mistakes of medically related words, and words which contain diphthongs.

However, I have noticed that the subjects of the experimental group were more co-operative and interested in recording their speech than those of the control groups. Moreover, the experimental group students seemed to me more confident in their

interaction than those of the control groups. Indeed, only five subjects from the first control group and five subjects from the second control group have willingly participated in the recorded classroom interaction whereas a majority of thirteen subjects from the experimental group have participated willingly in the interaction as shown in table 56.

Table 56

Students participated willingly in classroom interaction

Group	Subjects participated willingly	
	No. of participants	%
Exp.G.(N=39)	13	33.33
Con.G.1(N=34)	5	14.70
Con.G.2(N=41)	5	12.19

I was especially interested in the language functions used in classroom interaction. Unlike the students of the control groups who mostly expressed themselves in short sentences, most students of the experimental group spelled out their ideas at a discourse level as shown in table 57 below.

Table 57

Group	Students interacted in discourse level		
	Serial Nos. of subjects	No. of subjects	%
Exp.G.(N=13)	2 6 11 12 13 14 16 27 28 39	10	76.92
Con.G.1(N=5)	1	1	20
Con.G.2(N=7)	2 4	2	28.57

The recorded classroom interaction has shown that the students of the experimental group used various language functions in their interaction; their spoken discourse would be categorised under the following communicative functions: argumentative, descriptive, reportive and evaluative, whereas the language of the control groups was basically reportive in nature.

Although clear cut conclusions cannot be drawn from the results in tables 56 and 57 because of the many variables involved including psychological ones they may imply that authentic and medically related texts as well as group work activities used with the students of the experimental group would improve student motivation and attainment to participate in classroom interaction at levels larger than the sentence.

4.2.12.5 Evaluation of the course by the student

An attitude questionnaire in the students' mother tongue i.e. Arabic was given at the end of the course to test response to the entire course and its activities.⁽⁴³⁾ The vernacular was used in this questionnaire in order to eliminate any difficulty the students might have had in expressing themselves in English.

The results of the questionnaire showed that the EST course in general has helped students in understanding their medical studies.⁽⁴⁴⁾ The experimental group, however, seemed to have gained more from the course than the control groups as shown in table 58 below. The overall view in table 58 may imply that the course would have succeeded in motivating both the experimental group and the control groups towards it despite the difference in materials and some training schemes.

Table 58

Students' opinions of the EST course in general

Question 1	Group	Yes %	No %
Has the English course so far helped you in dealing with your study?	Exp.G(N=34)	94.12	5.88
	Con.G.1(N=31)	83.88	16.12
	Con.G.2(N=38)	86.85	13.15

The results also showed that only a small minority of the students in the experimental group felt that the EST reading texts they studied were below their aspiration whereas more than half of the students in each of the control groups felt that the reading texts they studied were below their aspiration as shown in table 59 below. The results may imply that the EST materials used in the experimental group would meet the needs and aspirations of most of the students in KFM.

Table 59

Students' opinions of the EST reading texts they studied in the course

Question 2	Group	Yes %	No %
Were the EST reading texts you studied below your aspiration?	Exp.G.(N=34)	20.59	79.41
	Con.G.1(N=31)	61.30	38.70
	Con.G.2(N=38)	52.64	47.36

It is to be mentioned here that although the students of the experimental group have mentioned that the material they studied had improved their performance in their study, they did not show statistically that. I found that in their performance on the medical subjects⁽⁴⁵⁾ in the first term there was no significant difference between the mean scores⁽⁴⁶⁾ of the experimental group and each of the control groups as shown in tables 60 and 61. There was also no significant difference between the mean scores of the control groups as shown in table 62.

The reasons behind the results in tables 60, 61 and 62 could be related to the insufficient number of English contact hours in the faculty which would make the indirect influence of the EST course on students' performance in their field of specialisation almost unlikely to come to the fore via statistical results.

Table 60

Students' performance on the medical subjects
Comparison of Exp. G. and Con. G. 1

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=39)	10.61	2.29	0.36	0.62	Not significant at the .01 level
Con.G.1(N=34)	10.25	2.68	0.46		

Table 61

Students' performance on the medical subjects
Comparison of Exp. G. and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Exp.G.(N=39)	10.61	2.29	0.36	-0.79	Not significant at the .01 level
Con.G.1(N=41)	11.01	2.17	0.34		

Table 62

Students performance on the medical subjects
Comparison of Con. G. 1 and Con. G. 2

Group	\bar{x}	S.D	S.E	T. Value	Level of Significance
Con.G.1(N=34)	10.25	2.68	0.46	-1.35	Not significant at the .01 level
Con.G.2(N=41)	11.01	2.17	0.34		

However, the students of the control groups mentioned that they would like to use a material similar to that used by the experimental group. Some of the control groups students even complained to me of their EST reading materials saying that it would be no use studying topics which were not directly relevant to their medical studies.

As shown in table 63 below, no student in the experimental group showed his dissatisfaction with the method adopted, though some were reserved to spell out their ideas. But at least a minority in the control groups agreed that the method adopted with them needed modification or alteration. Actually I would expect that the number of students who were dissatisfied with the method of teaching in a way or another would be higher as Iraqi students would find it very difficult to express their dissatisfaction with the method used by their teacher.

However, some of those who thought the method required modification mentioned that they wanted to see more oral discussion in classroom, and others asked for the use of video-taped films in the EST course sessions since there was a video system available in the lecture room in the faculty.

Table 63

Students' opinions of the methods of teaching adopted in the EST course

Question 3	Group	Yes %	No %	No Comment
Do you feel that the method adopted in teaching English so far needs altering or modification?	Exp.G(N=34)	0	94.11	5.88
	Con.G.1(N=31)	3.55	96.45	0
	Con.G.2(N=38)	28.94	71.66	0

As far as the number of EST contact hours students have had is concerned, the results showed that 25.24% of the students believed that two hours a week were not enough as shown in table 64, and some of them even suggested to have English contact hours of three to four hours a week despite their heavily loaded timetable. They also complained of having the two contact hours successively in the same day. This would imply that the EST course was being taken relatively seriously bearing in mind the students' heavily loaded curriculum.

Table 64

Students' opinions of the number of EST contact hours in the faculty

Question 4	Group	Sufficient %	Not Sufficient %	No Comment %	Suggested Less %
Is the number of EST contact hours sufficient? If not, how many hours would you suggest to be sufficient but suit your curriculum in the faculty?	Exp.G(N=34)	58.82	35.30	2.94	2.94
	Con.G.1(N=31)	77.41	16.15	3.22	3.22
	Con.G.2(N=38)	73.68	23.69	0	2.63
Total	103	69.90	25.25	1.94	2.91

As shown in table 65 there was an overwhelming majority of the students who believed that they might have gained more from their studies if the EST course had commenced before the commencement of their medical studies in the faculty. This would imply that the students' background in scientific English was not adequate enough to help them cope with their studies in the faculty despite the fact they would be considered of the top students in secondary school subjects including English. This may imply that a filling gap EST course would be necessary for them before embarking on their medically related studies (see also table 66).

Table 65

Students' opinion of a pre-medical EST course

Question 5	Group	Yes %	No %	No Comment %
Do you think that you might have benefited more from your study if the English course had commenced before the commencement of your study in the faculty?	Exp.G(N=34)	94.12	2.94	2.94
	Con.G.1(N=31)	90.33	6.45	3.22
	Con.G.2(N=38)	94.74	5.26	0
Total	N = 103	93.21	4.85	1.94

As shown in table 66, which is the answer to the second part of question 5, the majority of the students suggested that the first term (the first half of the academic year in the faculty) would be an appropriate period of time for the EST course before they began their studies in the faculty. Some of the students even went further to suggest that the EST course should be an intensive one, and to have contact hours of four hours a day, i.e. a total of 20 hours a week.

Table 66

Students suggestions for the length of the suggested pre-medical EST course

Question 5 (second part)	Group	1 month %	1st Term %	1st Year %	No Comment %
What period do you suggest for the pre-medical EST course if it could be implemented?	Exp.G(N=32)	21.87	43.76	9.37	25
	Con.G.1(N=28)	21.42	50	3.58	25
	Con.G.2(N=36)	22.22	44.46	5.55	27.77
Total	N = 96	21.87	45.84	6.25	26.04

As shown in table 67 below, the majority of the students have noticed that their level in English at pre-university stage has affected their performance and standard in the faculty.

Table 67

Students observations of the effect of their pre-university level in English on their medical subjects

Question 6	Group	Yes %	No %	No Comment %
Have you noticed whether your level in English at the pre-university stage has any influence on your performance in the faculty?	Exp.G(N=34)	70.59	23.52	5.88
	Con.G.1(N=31)	74.19	22.58	3.22
	Con.G.2(N=38)	84.21	15.79	0
Total	N = 103	76.70	20.39	2.91

Typically, the results in table 67 above comply with the results of the correlation coefficient between students' performance on their study subjects in the faculty and that of their performance on English in Iraqi General Ministerial Examination, which showed that there was a satisfactory positive correlation between the two as shown in table 68 below.

Table 68

Correlation coefficient between students' performance in English on the Iraqi Secondary School Ministerial Examination and their performance on their faculty subjects

Group	r	r ²	Relationship
Exp.G.(N=36)	0.46	0.21	Satisfactory
Con.G.1(N=33)	0.37	0.14	Satisfactory
Con.G.2(N=39)	0.49	0.24	Satisfactory
Total (N=108)	0.44	0.19	Satisfactory

To support the aforementioned argument it was also found that there was a satisfactory positive correlation between students' performance on the EST term test and their performance on their medical subjects as shown in table 69 below. This encourages me to suggest that students' level in English should be incorporated as one dimension, *inter alia*⁽⁴⁷⁾ for gauging students before being admitted to the faculty of medicine in Iraq.

Table 69

Correlation coefficient between students' performance on the EST term test and their performance on the medical subjects

Group	r	r ²	Relationship
Exp.G.(N=39)	0.43	0.18	Satisfactory
Con.G.1(N=34)	0.67	0.45	Satisfactory
Con.G.2(N=41)	0.56	0.31	Satisfactory
Total (N=114)	0.55	0.30	Satisfactory

As seen in table 70 the results of the questionnaire showed that the students still felt that understanding spoken English was still the most difficult language skill for them as they had mentioned in their first questionnaire at the beginning of the course (see table 15 p.303). They also reported that they were facing speaking difficulties and I think that was something expected as speaking skills began to be more needed than they were at the beginning of the course - now students were required to spell out their ideas orally in examinations, tutorials and laboratory work as they were approaching the end of the first term. This would draw our attention to the assumption that students' needs would change during the course and a 'dynamic needs analysis procedure' (see diagram 28, p. 267) would best suit the ESP course in Iraq as it would help gauge students needs and aspirations while the course was in application, and thus would answer arising demands before the termination of the course.

Table 70

Students' language difficulties as they see them at the end of the first term

Question 7	Group	Language Difficulties			
		Reading	Writing	Speaking	Listening
Mention the language difficulties (reading, writing, speaking and listening) you are still facing.	Exp.G.(N=34)	26.47	17.64	44.11	38.23
	Con.G.1(N=31)	32.25	19.35	50	58.06
	Con.G.2(N=38)	31.57	21.05	50	55.26
Total	N = 103	30.99	19.41	47.57	50.48

The results have shown that "Reading Skills" have now come down to the third level in order of difficulty (%30.99) in comparison to students' reading skills difficulties at the beginning of the course. This may imply that the course has achieved some success in dealing with students' reading skills difficulties. It, however, seems to have dealt with the experimental group's reading skills difficulties in a better way than those of the control groups. Though I still feel that the course has not helped students much as far as listening and speaking skills are concerned, I would be able to say that it has relatively achieved initial success in that respect as the rate of students' difficulties in those skills seemed to have dropped in comparison with the students' difficulties in the same skills at the beginning of the course (cf. table 15, p303). The experimental group's difficulties in speaking and listening skills however, seem to be less than those of the control groups. This would imply that integration of reading skills with other language skills would have its effect on students' performance in those skills. The course as a whole, particularly that part related to the experimental group, seemed to have achieved some success as far as motivation is concerned. On the other hand, psychological tension seemed to be higher on the subjects of the control

groups (as they mentioned in the questionnaire) than those of the experimental group when they expressed themselves orally in classroom situation. This result, I believe, could be attributed to the effect of group work activities on the subjects of the experimental group.

4.3 Discussion

This field work is concerned with the effect of the EST materials, and teaching techniques which were conducted for the purpose of monitoring and comparing the achievement of students in an experimental group and two groups in Kufa Faculty of Medicine in Iraq. The results have shown that there was a significant difference between the experimental group and each of the control groups in their reading skills, reading speeds, language performance at the discourse level, self-confidence as well as differences in students' motivation towards the EST reading materials which was significantly higher in the experimental group than in the control groups.

Notes Related to Chapter Four

1. "Open" means here that the course is ready to be modified in the light of new ESP theories and results of experimentation.
2. The learning/teaching situation in KFM is identical to that of the other Iraqi faculties of medicine. It is to be noted that all medical faculties in Iraq are sponsored and supervised by the same educational authority, namely the Ministry of Higher Education and Scientific Research (see Ministry of Higher Education and Scientific Research, 1977). It would be worth mentioning that the first faculty of medicine founded in Iraq was in 1927 in Baghdad and the language of instruction has been English since then (Harby, 1965:16).
3. It was assumed that first year students commence normal classroom attendance on the 16th of October.
4. "Topics" refer to the reading texts and their relative exercises which were to be used in the EST course.
5. The texts were selected from 'Doctor's Answers' Marshall Cavendish Ltd., London, 1981.
6. The lowest pass mark in the Iraqi secondary school system is 50 and the highest obtainable mark is 100.

7. They were Mr Saad R. Abdul Karim, MSc student, Department of Pharmacology, University of Sheffield, formerly instructor (MBChB) at KFM, Al-Mustansiryia University; Mr Safa Saoudi, Ph.D student, Department of Anatomy, University of Sheffield, formerly instructor (MBChB) at the Faculty of Medicine in Basrah University, and Mr Adeeb Augustin, MSc student, Department of Anatomy, University of Sheffield, formerly instructor (MBChB) at the Faculty of Medicine, Salah Al-Deen University, Arbil.
8. The subject teachers were nine Iraqis and seven foreigners (Indians).
9. This table shows the responses of question no. 2 of the questionnaire. In calculating the results points were distributed as follows: 4 points for number 1, 3 for number 2, 2 for number 3, and 1 for number 4. The same distribution applies to tables 4 and 5.
10. 'N' refers to the number of participants.
11. This table shows the responses of question no. 3. In calculating the results one point was given for each ticked skill. The same calculation applies to tables 7 and 8.
12. In calculating the results, points were distributed as follows: 5 points for number 1, 4 points for number 2, 3 points for number 3, 2 points for number 4 and 1 point for number 5. The same distribution applies to tables 10 and 11.

13. 'Team teaching' refers to teaching EST courses whereby a collaboration between the subject teachers and the EST teachers in teaching the EST materials is achieved (see Henderson and Skehan, 1980:38).
14. Indeed one of the subject teachers told me that at the beginning of the medical course he had noticed that the students were not acquainted with English words such as 'liver' and 'kidneys'.
15. 'Preview activities' include oral questions or a short summary of main ideas in the reading texts which would encourage and help search reading (see Kennedy and Hunston, 1982:vi).
16. In calculating the results in this table, points were distributed according to the importance of the skill needed as follows: 4 points for number 1, 3 points for number 2, 2 points for number 3 and 1 point for number 4.
17. It is to be noted that this test would not be considered a pure listening comprehension test item but a hybrid test item since it actually involves both listening skills and reading skills as students have to listen to the text and then read and select the appropriate answers from among some options. However, from the point of view of communication and global testing certain hybrid test forms would be considered as valid measures of the students' mastery of the target language (Valette, 1977:14).

18. It is to be noted here that the preEST test responses were checked by Mr Salah Kutub, lecturer in English, University of Minia, Egypt. (He is at present reading for Ph.D in English Language, Department of English Language, Sheffield University.) The subjective part of the test (sub-test no. 3) was scored by Mr Salah Kutub and Mr Habib Abdesslem, University of Tunis (who is now reading for M.Phil. in English Language, Department of Linguistics, Sheffield University.).
19. 'SPSS' refers to the 'Statistical Package for the Social Sciences'. For a simple guide of how this package is used see (Richards, R.K. (1978) A Simple Guide to SPSS a manual published by the computing services, University of Sheffield.
20. In order to check whether this test was a valid test, i.e. would measure what it was intended to measure (Womer, 1968:48) a full item analysis for the test was carried out. The answer sheets were arranged in rank order from the highest score to the lowest, and then divided into three piles: the upper third, middle third, and lower third. In order to measure item validity a statistics called Phi coefficient (ϕ) may be employed to report the relationship between item response and criterion performance in the form of a correlation coefficient. To identify

the minimum value of Phi coefficient that would reach statistical significance at the .05 or .01 levels the following formulas are used (Anastasi, 1976:214):

$$\phi .05 = \frac{1.96}{\sqrt{N}}$$

$$\phi .01 = \frac{2.58}{\sqrt{N}}$$

In these formulas, N represents the total number of students passing the item correctly in both upper group and lower group combined. Thus, if there were 20 students in upper and 20 in lower groups, N would be 40 and the minimum ϕ significant at the .05 level would be $1.96 \div \sqrt{40} = .309$, and at the .01 level would be $2.58 \div \sqrt{40} = 0.407$. Any item whose ϕ reached or exceeded .309 would thus be valid at the .05 level of significance, and any item whose ϕ reached or exceeded .0.407 would thus be valid at the .01 level of significance.

Therefore the validity of the listening skills test items could be seen as follows:

$$\phi .05 = 0.800$$

Item 1	ϕ 0.876	significant at the .05 level
Item 2	ϕ 0.876	significant at the .05 level
Item 3	ϕ 0.980	significant at the .05 level
Item 4	ϕ 0.544	not significant
Item 5	ϕ 0.876	significant at the .05 level

The test proved to be statistically valid, but one has to bear in mind that the degree of test validity would not be based only on a statistical analysis of test performance. Careful analysis of the content of each item and evaluation of the test as a whole and the purpose of the test should also be put into consideration (Valette, 1977:46).

However in order to check how difficult was the test, item difficulty was measured by finding the percentages of the persons answering the item correctly (Anastasi, 1976:209). For most testing purposes items closer to the %50 difficulty level are preferable (Ibid:213). Hence, item difficulty of the listening skills test is shown as follows:

Test Difficulty	
Item No.	Difficulty level %
1	24
2	24
3	36
4	80
5	24

Thus the items proved to be statistically difficult. But decisions about item difficulty should not be made routinely. They should be linked to the purpose of the test. For instance, a test which is administered prior to a learning unit to determine whether certain skills have already been acquired by

the students may show "very low percentage of passing for each item. In this case, items with very low or zero P values should not be discarded, since they reveal what remains to be learned" (Ibid:206).

21. One standard statistical procedure to determine whether or not the difference between the means could be due to chance is to compute the 'T Value'. This would test the significance of the results. When the results cannot be reasonably attributed to chance, they would be said to be 'significant'. "A test is said to be significant if the null hypothesis is rejected at the 0.05 level of significance, and is considered highly significant if the null hypothesis is rejected at the 0.01 level of significance" (Walpole and Myers, 1972:239). Hence if the calculated 'T Value' reached or exceeded the tabulated one, the test is said to be significant otherwise it is not significant (see Ibid:460 for a table showing the approximate significance of tests).

However, in educational statistics it is preferable to have a 5 per cent or a 1 per cent chance of being wrong, and the results are tested according to whether the chances of being wrong are less than 5 per cent or less than 1 per cent. As far as this study is concerned a T. Value will be considered significant at the .05 level if it reaches or exceeds 1.64, and significant at the .01 level if it reaches or exceeds 2.32 (Ibid).

22. It would be of importance at this stage to shed light on the following statistics used in the T. Test:

- " \bar{x} " refers to the 'mean' or the 'average' which is a measure of the central position of the scores.
- "S.D" refers to the 'standard deviation' which is the measure of dispersion of scores around the mean. In general a set of scores with a low standard deviation will be more accurate than a set of scores with a high one.
- "S.E" refers to the 'standard error' which is the measure of accuracy of the experimental mean as an estimator of population mean. For example, if a set of 40 test scores has mean 6 and standard deviation 2, then the standard error is $2 \div 40 = 0.31$, and we can be 95 per cent sure that the true mean lies between $6 \pm (2 \times 0.31)$, that is, between 5.38 and 6.62. (For more information about \bar{x} , S.D and S.E, and their computation and application, see Simpson, 1974:227-32, Vallette, 1977:50-51, Womer, 1968:12-32, and Pumfrey, 1977:91-107). (For computation and application of T. Test see Walpole and Myers, 1972:238-45).

23. As far as the test's validity and difficulty are concerned, I have found that the test was valid and the difficulty of most of its items were around 50% as shown below:

Test Difficulty

<u>Item No.</u>	<u>Difficulty Level %</u>
1	40
2	56
3	52
4	76
5	32

Test Validity

$$\emptyset .05 = 0.392$$

$$\emptyset .01 = 0.816$$

<u>Item No.</u>	<u>\emptyset</u>	<u>Level of Significance</u>
1	0.800	Significant at the .05
2	0.620	" " " .01
3	0.741	" " " .05
4	0.523	Not significant
5	0.876	" " " .05

24. As far as the test' validity and difficulty are concerned, I have found that the test was valid but its items would be considered easy items as a pre-test as shown below:

Test Difficulty

<u>Item No.</u>	<u>Difficulty Level %</u>
1	76
2	96
3	76
4	84
5	80
6	84

Test Validity

$\emptyset .05 = 0.490$

$\emptyset .01 = 0.645$

<u>Item No.</u>	<u>\emptyset</u>	<u>Level of significance</u>
1	0.744	significant at the .01 level
2	0.645	" " " " "
3	0.778	" " " " "
4	0.715	" " " " "
5	0.715	" " " " "
6	0.715	" " " " "

25. Students' speed in answering the "Pre-EST Course Test" was computed by dividing the tests' full mark i.e. 50 by the period of time in minutes which the student spent in finishing the test. Hitherto, the result shows the mark which the student should have got for every minute he/she sat for the test i.e. students' speed is reflected in marks per minute. (See appendix 15 for the SPSS Programme used for computing speeds).
26. The 'correlation coefficient' measures the degree of agreement between two sets of values. It can take values between -1 and +1. A value of +1 denotes perfect agreement between the two values, i.e. high values on one test being associated with high values on the other, whereas a value of -1 denotes perfect counteragreement between them, i.e. high values on one test being associated with low values on the other. A value of 0 indicates complete lack of agreement between the variables. (Walpole and Myers, 1972:300-4).

It should be made clear that the interpretation of a correlation coefficient, of whether it is strong or weak, good or bad, high or low, depends upon the reasonable expectations that we may have for a relationship between the two variables of a test. Generally speaking, correlations in testing which are 0.30 and below would be considered weak, those which are around 0.40 to 0.60 would be considered satisfactory or moderate, and those which exceed 0.70 would be considered high (Womer, 1968; 23-4).

27. In order to interpret the relationship of two variables as the percentage of variability that two sets of values have in common, the correlation coefficient is to be squared (r^2) (Womer, 1968:24).
28. These examples were constructed in collaboration with the biochemistry subject teacher in the faculty.
29. For more information about laboratory experiments relative to medical students see Swales, John and Fanning, Paul (1980) English in the Medical Laboratory. Thomas Nelson and Sons Limited, U.K.
30. In collecting information relative to these examples I depended heavily upon Jefferies, Pamela M. (1979) Bailliere's Nurses' Dictionary, 19th Edition, William Clowes (Beccles) Limited, Beccles and London.
31. In Iraqi secondary schools boys and girls study in separate institutions.

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32. The first and second terms were used by subjects nos. 21 and 8 respectively. The third one was used by subjects nos. 16 and 33. (See appendix 21).
33. The text was extracted from: Romanes, G.J. (1977) Cunningham's Manual of Practical Anatomy, Volume Two, Thorax and Abdomen. Fourth Edition, O.U.P. Oxford, New York, p.27.
34. The scoring of this test was checked by Mr Habib Abdesslem, University of Tunis (studying for M.Phil in English Language, Department of Linguistics, Sheffield University).
35. As far as the test's difficulty and validity are concerned, I have found that the test was valid and its item difficulty were acceptable as a post test as shown below:

Test Difficulty	
<u>Item No.</u>	<u>Difficulty Level %</u>
1	97.22
2	85.18
3	74.07
4	80.55
5	87.96

With regard to the test's item difficulty, it is to be mentioned here that although in most testing situations items clustering around a medium

difficulty, i.e. .50, would yield the maximum information about the students' level of performance, interpretation of item difficulty levels is actually dependent on the purpose of the test. Therefore, if the purpose of the test is to ascertain whether a student has adequately mastered the basic essentials of a skill, as it is the case in the "First and Second Reading Skills Tests" in this study, items would be accepted at the .80 or .90 difficulty level. Indeed "the very easy items (even those passed by 100% of the cases), which are discarded as non-discriminate in the usual standardised test, are the very items that would be included in a mastery test." (Anastasi, 1976:206).

Test Validity

$$\phi .05 = 0.230$$

$$\phi .01 = 0.304$$

<u>Item No.</u>	<u>ϕ</u>	<u>Level of Significance</u>
1	0.307	Significant at the .01 level
2	0.333	" " " " "
3	0.364	" " " " "
4	0.341	" " " " "
5	0.330	" " " " "

36. On a 'speed test' scoring will depend not only on knowledge and comprehension but also on the speed at which students progress because even the most able

students would probably not be able to finish within the specified time (Valette, 1977:49).

37. On a 'power test' even the weakest and slowest student would be allowed sufficient time to finish, even though he/she may not actually do so due to the difficulty of the items (Valette, 1977:49).
38. The scoring of this test was checked by Mr Salah Kutub, lecturer in English Language, University of Minia, Egypt (studying for Ph.D, Department of English Language, University of Sheffield).
39. As far as the test's difficulty and validity are concerned, I have found that the test was valid and its item difficulty were acceptable as a post test as shown below (see ft. 35).

Test Difficulty

<u>Item No.</u>	<u>Difficulty Level %</u>
1	94
2	68
3	59
4	90

Test Validity

$$\emptyset .05 = 0.232$$

$$\emptyset .01 = 0.306$$

<u>Item No.</u>	<u>\emptyset</u>	<u>Level of Significance</u>
1	0.333	Significant at the .01 level
2	0.380	" " " " "
3	0.402	" " " " "
4	0.335	" " " " "

40. 'The EST Term Test' was scored again and checked by Miss Fa'za Al-Anni, lecturer in English Language, University of Baghdad (reading for Ph.D in English Language, Department of English Language, University of Sheffield), and Mr Ali Nasir Harb Mansouri, University of Basrah, (reading for Ph.D in English Language teaching, Department of Linguistics, University of Sheffield).
41. As far as the difficulty and validity of the first part of the 'EST Term Test' are concerned, I have found that the two versions were valid and their difficulty were acceptable as shown below:

The Experimental Group Version

Item Difficulty

<u>Item No.</u>	<u>Level of Difficulty %</u>
1	100
2	97.36
3	86.84
4	81.57
5	89.47
6	89.47
7	89.47
8	100
9	89.47
10	89.47

Item Validity

$\emptyset .05 = 0.384$

$\emptyset .01 = 0.505$

<u>Item No.</u>	<u>\emptyset</u>	<u>Level of Significance</u>
1	0.505	Significant at the .01 level
2	0.516	" " " " "
3	0.563	" " " " "
4	0.576	" " " " "
5	0.526	" " " " "
6	0.538	" " " " "
7	0.526	" " " " "
8	0.505	" " " " "
9	0.538	" " " " "
10	0.538	" " " " "

The Control Groups Version

Item Difficulty

<u>Item No.</u>	<u>Level of Difficulty %</u>
1	94.11
2	91.17
3	97.05
4	88.23
5	100
6	100
7	97.05
8	97.05
9	88.23
10	70.58

Item Validity

$\emptyset .05 = 0.408$

$\emptyset .01 = 0.538$

<u>Item No.</u>	<u>\emptyset</u>	<u>Level of Significance</u>
1	0.563	Significant at the .01 level
2	0.576	" " " " "
3	0.563	" " " " "
4	0.563	" " " " "
5	0.538	" " " " "
6	0.538	" " " " "
7	0.538	" " " " "
8	0.538	" " " " "
9	0.576	" " " " "
10	0.609	" " " " "

42. See appendix 21.

43. Translation is provided as shown in the tables which contain the results of the questionnaire.

44. The attitude of the control groups towards their course is not limited to the EST textbook alone, but it was to the entire course which included the teaching of study skills, laboratory report writing and essay writing.

45. Comparison here was made between the average scores of Anatomy, Histology, Biochemistry and Physics. (For comparison of students' mean scores in each of the above subjects see appendix 22).

46. Term-tests marks were out of 20.

47. In order to be admitted to the faculty of medicine in Iraq, students have to score at least 70 out of 100 in Zoology, Physics and Mathematics as an additional condition to the required total average for entry to the faculty of medicine. (See Central Admission Bureau, 1982).