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FACTORS INFLUENCING THE DESIGN AND IMPLEMENTATION OF EAP CONTENT-BASED COURSES FOR SECOND-LANGUAGE UNDERPREPARED STUDENTS AT TERTIARY LEVEL: A SOUTHERN AFRICAN PERSPECTIVE

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SYNOPSIS

This study explores the factors which influence the design and implementation of EAP content-based courses for second-language learners at tertiary level. It draws upon international experience in this area, information from a case study of an adjunct EAP, content-based engineering course at the University of the Witwatersrand and the experience of other EAP practitioners in Southern Africa. A set of key, comprehensive factors which affect the success and effectiveness of EAP content-based courses are identified.

DECLARATION

I declare that this thesis is my own, unaided work and that I have given acknowledgement to the sources which I have used. It is being submitted for the degree of Masters of Education at the University of the Witwatersrand. It has not been submitted before for any degree or examination at any other university.

Permission to include data and quotations in the investigation section was sought and cleared with the individuals concerned. The organisation of the overall data is based on my own interpretation and does not reflect the views of institutions.

Poretia

Piyushi Kotecha

1st November 1993

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CHAPTER 1: INTRODUCTION

The main purpose of this study is to examine the factors which influence the design and implementation of content-based or contextualised EAP courses for second language underprepared students.

Since EAP courses only have a 10-15 year history in Southern Africa, a crucial aspect of this task is to examine the theory and practice in this field internationally which has a considerably longer and established history of 50 years.

The sources of information are the experience of a particular EAP course in engineering at the University of the Witwatersrand presented as a case study as well additional information from similar types of courses being offered at universities in South Africa. Predominant concerns and problems are documented, common threads drawn and the main factors influencing the design and implementation of such courses in South Africa are identified. In documenting the above, a study of this nature is primarily aimed at a wider group of South African EAP practitioners and course designers.

Rationale

Academic Development (AD) at tertiary level is a relatively new area of educational practice in South Africa. The majority of AD practitioners are engaged in addressing the language and learning needs of English second language (ESL) students in academic contexts. As it is a new and growing concern, AD practitioners have tended to work intensively and in isolation within their own immediate contexts. Apart from the annual AD conference forum, few opportunities have existed for collaborative or comparative academic exchange in this area.

Practitioners have had to develop practical responses to the combined challenges of:-

a) addressing educational underpreparedness of the students

b) meeting the expectations of mainstream staff to equip students with the necessary skills for the pursuit of higher education in a relatively short period of time

c) developing interventions outside mainstream curriculum development.

These are major challenges in the absence of established practice or research in this area. In addition, the relatively junior status of the practitioners and the generally poor regard for educational practice in universities have exacerbated the problem.

Despite these constraints, considerable insight and experience has been gained in significant areas such as:-

a) the nature of academic literacy and cognitive development,
b) ways in which to influence mainstream staff and structures to sustain AD work in the future and
c) the kind of pedagogical and methodological factors which enhance good practice.

There is a growing need for research in this area: a deeper understanding of students' language-related problems and information about working courses in this area is required to assess their relative successes and failures. This study attempts to explore these issues from the perspective of one such course.

Research Design

1. An extensive international literature search was conducted of the work done by theorists and practitioners in EAP. This literature was itself used as a vehicle for the design of the Wits engineering EAP course.

2. The course was developed using information from the South African literature as well as local experience.
3. The study is based on reflections of the key factors which informed the Wits EAP engineering course as well as the experience of other EAP practitioners.

Time Frame

The literature search was conducted initially in 1987 and regularly updated. The data collection took place in 1991: the questionnaire was sent out in March 1991 and the interviews were conducted in November 1991.

Methodology

Action research served to identify key issues and questions from within the Wits course, which in, turn informed a set of questions for the questionnaire and the interviews for other practitioners. In other words, issues surfaced from the particular experience of teaching a course which were then tested in the wider field to assess their generalisability. Therefore, personal experience has unquestionably influenced the type of questions posed in the subsequent survey.

CHAPTER 2: THE LITERATURE SEARCH

2.1 Part 1: International

Internationally, EAP courses at tertiary level usually fall under the broad umbrella of what has come to be known as English for Specific Purposes (ESP). The ESP movement is a relatively new but fast growing concern within the more widely known English Language field. Much has been published on the experiences gained internationally within the ESP movement.

The origins, the theory and practices of various ESP projects as well as the identification of the dominant trends in needs analysis, curricula/ staffing arrangements and materials development matters are of importance.

2.1.1 What is ESP?

Internationally, English has become the language for the communication of scientific and commercial interests:
"The phenomenal spread of the English language throughout the world is an uncontested fact : English is used by about 750 million people, only half of whom speak it as a mother tongue. More than half of the world's technical and scientific periodicals are in English, and English is the medium for 80% of the information stored in the world's computers". (Norton-Pierce, 1989 :401).

As a result, in many countries, the scientific community often makes a conscious switch to English even though the home language can "serve adequately and even elegantly as a vehicle for expressing and discussing matters of science" (Strevens, 1980:74)

Hutchinson and Waters (1987:7) attribute this to the "realities of the market place". They argue that the demand for an international language arose due to a massive expansion in the scientific, technical and commercial fields worldwide and given the economic muscle of the USA, post 1945, it fell upon English to assume this role.

Other reasons for the use of English have been that it has served the role of a unifying language in many ex-colonial countries and that its structures are of an accommodating nature. In addition, "its discourse rules and vocabulary are resilient, its widespread use and proven ability to grow with developing expertise in countless fields" (Strevens, 1980:109) shows that it is a powerful and accepted communication tool.

Consequently, there has been a remarkable growth in English as a Foreign Language (EFL) teaching internationally. Over the years, Strevens (op.cit) has noted tht the courses have become less and less generalised in content and more and more closely related to the learner's needs and wishes. Pressure has been put on the language teaching profession to deliver functional English courses.

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

English began to address the need for developing English proficiency in particular subject areas like Botany, Medicine and Engineering as opposed to the strong tendency to view English as a literary 'subject'. (This literacy bias in secondary school teaching strengthens the perception in science-inclined pupils that English as a subject for the Arts and therefore does not merit serious attention).

At a teaching-learning level, increasing dissatisfaction was reported over general purpose courses : they were felt to be inadequate by practitioners as the learners tended to be motiviated adults (Robinson, 1980) for whom English was a vehicle for the expression of some immediate and specific purpose. Most

ESP learners already had some general education and required ESP for a practical reason.

This distinction is neatly explained by the following : "the general with which we are contrasting the specific of ESP is that of general, education-for-life, culture and literature orientated language course, in which language itself is the subject matter and the purpose of the course. The student of ESP, however, is learning English en route to the acquisition of some quite different body of knowledge or set of skills" (Robinson, 1980:6).

Another way of looking at this distinction is to view ESP as training for the development of restricted competence and General Language as education for the development of general capacity (Widdowson, 1983).

Thus, a re-orientation in English Language teaching began and the result has been the emergence of a new approach to language learning. A recognised branch has become established. It is important to note that it does not constitute a separate discipline as such but rather " an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning' (Hutchinson and Waters 1987:19). Who the learners are, the nature of the language in which they will need to operate and the learning context all determine the nature of an ESP course.

So, what are the characteristics of ESP course? Strevens (1980:109) offers us a working definition :

" ESP entails the provision of English Language instruction :

1. devised to meet the learner's particular needs
2. related in themes and topic to designated occupations or areas of study
3. selective (ie not general) as to language content
4. when indicated, restricted as to the 'language skills' included."

An ESP course aims to develop successful performance, ie, linguistic and communicative competence in second language learners for higher education or for specialised purposes in business, industry or the professions. The teaching of ESP courses usually takes place outside the school system and within tertiary institutions since these are unlike the conventional English courses.

The notion of a needs analysis is central to the process by which relevant and appropriate content for specialised language courses and therefore a syllabus or curriculum are arrived at (Mackay, 1978).

Munby (1978) has been responsible for devising an instrument (The Communication Syllabus design) which identifies a set of needs analysis procedures as a base for syllabus specification. Valid syllabi for specific groups of learners are drawn up after determining the communicative needs of those learners.

However, in practice, the constraining factors are usefully described by Chambers (1980:30) who says that " the problem of why needs seem so contradictory, restrictive, damaging to the course and intractable to any answer by needs analysis becomes clearer. Most of the clashes are not clashes of needs, but various restrictive constraints demanded by the participants on the course, who are likely to have dissimilar interests."

Thus, ESP courses differ from each other as they are based on an analysis of learners' needs : the language, skills, topics all depend on the 'target' situation. Thus the core content is usually non-transferable although the methods adopted can be of interest and of use in other settings. ESP input usually takes place over a limited and intensive period of time (Robinson, 1980).

In addition, the design of an ESP course is determined by :

i the purpose for which the students are learning English
ii the time available
iii the age of students
iv the level of study

In short ESP can be viewed in respect of terminal aims, for example, being able to write a scientific report.

English For Science and Technology : EST

ESP courses as mentioned before are distinguished by the nature of the learners' specialism. Historically, within the ESP field, several recognised sub-branches emerged : for example, English for Science and Technology (EST), English for Medical Studies (EME), and English for Business and Economics (EBE).

EST has always been a major and is the oldest branch within ESP. Although the language patterns in EST are not dissimilar to those employed in General English, there are certain features of scientific discourse which merit a specific approach. Thus the content and characteristics of science necessitated the development of EST as a distinctive branch.

It has for some time been acknowledged (Gilbert and Osborne 1980, Davies and Green 1984, Swales 1985) that studying in the sciences places specific demands on the learner at school and tertiary level.

The language of science has been described as "impenetrable and distanced from the pupils' own language" (Davies, 1986:101)

The APU "Language of Science" report (1988:35) states categorically that the "linguistic community of science is not easy to enter". Sutton expresses the same sentiment but in a stronger way, "there can be no doubt that science is in many ways the natural enemy of language" (1980:51).

Furthermore, the readability of science texts poses problems "Scientific language strives to be precise. often this means that the reader is exposed to a large number of scientific terms, each with their own precise meaning outside familiar context cues, all embedded in an extremely complicated sentence structure" (Bulman, 1985:21).

The impersonal tone and form of scientific English are real barriers to understanding. Davies notes that "science texts are constantly rated as being the most difficult" (1986:101). It has been found that the average reading level of material faced by first formers in science(11 year olds) called for a reading age of 13.5 years in British education (Harrison 1979).

At tertiary level, Bradley, Staskun and White (1985:175), go as far as saying that " the technical vocabulary required of a first year student of science is at least as extensive as that typically required in a foreign language course. Many of the concepts that these technical words are meant to identify are abstract and unfamiliar, rather than concrete and familiar."

Scientists, historically, have tried to give words fixed meanings. Although science teachers are frequently aware of the Greek and Latin origins of many of the terms employed, learners often find it difficult to access their meanings since they have not had sufficient exposure to the literature. Therefore, they need to be taught to develop "an awareness of how language is a tool in the struggle to interpret experience" (Sutton, 1980:53).

Sutton (1980) suggests that all learning involves a search for meaning. He makes a distinction between the denotative and connotative meaning of words. One can arrive at the denotative meaning of a word by using a definition. Connotative meanings are arrived at through knowledge of the definition as well as how the word has come to be used by scientists historically. Science teaching appears to have underplayed or rejected the latter method for word explication. In science, both methods need to be

employed but the nature of science teaching does not make this explicit, thus rendering room for misinterpretation of words.

Scientific discourse is also characterised by an elaborate combination of non-verbal forms such as graphs and diagrams, "scientific English" (the vocabulary of which is partly common-core and partly specialised), and mathematical formulae. Extensive exposure to and practice of this form of communication is required in order to help develop scientific thought.

Scientific English, as a variety of English, is described by Strevens (1976) as consisting of "superficial surface features" and "deeper levels". The superficial surface features include:

* long complicated noun phrases
* passive constructions
* logico-grammatical constructions
* items of specialised vocabulary

Deeper levels of scientific English cover the rhetoric, argument and communication functions of language which are chosen to serve a particular purpose of the writer. The actual acts are to do with classification, description, inter-relationships or explanation.

The above two categories of features combine to give scientific English (as opposed to any other "kind" of English) its distinguishing characteristics.

Another factor which contributes to the difficulties of learning science is the way in which everyday words used in a science context take on a different meaning (Johnstone and Cassels, 1978). Many common science words do not appear to be understood correctly by learners who get confused by the everyday meaning of the words.

Scientific writing also employs a recognisably precise, concise and objective style unlike the Arts which allow and encourage a

greater degree of individual expression and style. (Barnes and Barnes, 1981) In most secondary schools worldwide. it is the latter style which is formally taught at the expense of the former.

The above features have been the organising principles around which EST courses have tended to be designed. The emphasis given to these features, however, can vary from one EST course to another depending on the prevailing understanding of scientific language, linguistics, students' educational backgrounds and the needs in the classroom : all these factors inform and influence course designers.

Development of ESP and EST

It is useful review the developmental threads that can be identified in ESP and EST (Robinson, 1980, Hutchinson and Waters, 1987). Both went through the following stages:-

1. Early EST courses were based on the notion of specific registers for example Chemistry or Engineering subjects which were studied in depth to identify their grammatical and lexical features. Attention was placed on the frequency of key vocabulary items or the predominance of certain verb forms. Language exercises were then devised around these core items. Register analysis characterised texts in respect of their formal linguistic properties, ie, the passive voice and specialised semi-technical vocabulary.

   Common criticism was that syllabus design
   a) was based on a quantitative approach
   b) remained at sentence level.

2. The next stage involved a shift from isolated sentence work to look at how sentences combined to give meaning. This became known as rhetorical or discourse analysis. Text analyses were conducted on the

assumption that texts, like language would vary in accordance with their subject matter. So in EST, cause and effect, definitions, description were included in the materials. Widdowson (op cit) criticised register analysis as inadequate since activities based on this approach did not focus on how meaning was arrived at.

3. The subsequent school of thought developed the notion of target situation analysis (TSA) which was an attempt to systematise all past developments by detailing the learners'needs in terms of communication purposes. Thus the communication setting, the means of communication, language skills and functions were all studied as a whole. Increasingly, the material was made more and more relevant to the learners' needs. Munby (op.cit) developed the communication syllabus design so that the course designers had a checklist as a frame of reference.

Despite this attempt at systemisation of needs, certain obvious limitations remained because of the nature of ESP itself; it is difficult to produce a truly relevant course design because :

a) the needs of a group change
b) defining needs is not enough : variety and level of material needs to be considered

It is acknowledged by linguists that identifying needs is a tricky business and that it is difficult to get it absolutely right. In an interesting departure from the commonly accepted student-based needs analysis, it has been suggested that needs analysis to be done by three separate parties ; the learner, the teaching establishment and the user establishment (Richerich and Chanceral, 1978).

This kind of triangulated needs analysis is necessary and desirable but Chambers (1980:30) suggests that as a

priority, target situation analysis should be the main data source. He advocates that "needs determined by TSA are the real needs which all efforts should be made to fulfill... because needs determined by TSA, are relatively permanent and provide the aims of the course."

In response to the constraints of contradictory needs of different stakeholders and the transient nature of needs, Chambers (op.cit) offers two solutions. Firstly, since needs change, to plan a course in terms of short-term, medium-term and long-term objectives and secondly to incorporate a process of "off-line" research (ie, needs identified by research prior to the course and "on-line" research (ie, continuous assessment of the needs established by off-line research, ensuring that they are appropriate and being accomplished).

4. The skills and strategies approach followed. This has gone beyond the surface forms and is based on the notion that there are common reasoning and interpreting processes underpinning all language use which allow us to extract meaning from discourse. Learning is viewed as a process and learners as processors of information. Essentially, this approach is informed by the cognitive theory of learning.

5. Hutchinson and Waters (1987) have placed the notion of learner-centred syllabi on the theoretical agenda. They claim that learning theories make up the missing dimension in language learning and should inform practitioners on how to facilitate language learning. Language training per se does not provide teachers with the know-how: meta-cognitive skills employed by learners also have a bearing on language learning. Earlier approaches tended to concentrate on the technical aspects of how language is learned. It can be seen that a combination of developments in

educational psychology, the language movement and in applied linguistics have all had an influence on ESP.

In summary, a clear trend can be identified : a narrow view of language development has been found to be limiting. The above five developmental steps **when combined** offer a more complete and satisfactory understanding of language learning. Register analysis, discourse analysis, target language and requirements, information-processing and the motivational and affective factors that the learner brings to bear on the task are all important dimensions at the language learning and teaching interface.

2.1.2 Theoretical Issues Regarding Language Acquisition, Second-Language Acquisition and the Communicative Language Movement

What is Language acquisition?

Language acquisition is the study of how human beings acquire a grammar : a set of semantic, syntactic, morphological, and phonological categories and rules which underlie their ability to speak and understand the language to which they are exposed. Language acquisition is the study of the transformation from a mental state in which the child does not possess a grammar of a particular language to a mental state in which the child does (Parker, 1986).

The theoretical work of many of the most notable psychologists and linguists over the last seventy years has culminated to a point whereby we can pose the question; "Does the initial state of the human mind contain language-specific capacities and/or general cognitive capacities?" In the late fifties, the work of two theorists, Skinner and Chomsky set the parameters of the debate in motion.

Skinner (1957) argued that children are not born with linguistic knowledge but that language ability is gained by making

associations among events in the environment. Behaviour, according to him, is a function of specific environmental factors and is culturally determined. Human beings learn by doing and engaging with events, behaviour is trainable and rules are acquired through interaction. The behaviourist theory "regards the person as essentially a being rather than as an agent. He is passive and moulded by his environment" (Clark, 1975:307).

On the other hand, Chomsky (1959) argued that children are born with the innate knowledge of the structure of human language. He postulated the existence of a Language Acquisition Device (LAD), more commonly known as the "black box", which is activated by hearing spoken language. His argument was that we all have the ability, from a very young age, to make grammatically correct sentences which we have never heard before. Essentially, he believed that the LAD contains prior knowledge of language ie, human beings are born with the capacity of speech.

Piaget (1982) disagreed with the notion that language specific structures were innate. He believed that language acquisition arose out of the interaction of various cognitive capacities like intelligence, memory and motivation.

He developed the position that children's cognitive development is shaped by their active as well as their unconscious structuring of input from the environment. At each stage of development, they can only deal with aspects of the world that they can make sense of. Children assimilate new input into their thought. From concrete to symbolic operations, children develop the ability to form mental images of objects after which they link words to them.

Piaget observed that children's speech did not determine behaviour and that language is constrained by the level of sophistication that has already been attained in cognitive development : "Language ability is generally determined by the level achieved in cognitive development." (op cit)

1982).

His phrase "language services thought" summarises his position on the relationship between language and cognitive development.

Vygotsky (1962), submitted the hypothesis that "Thought must pass first through meaning and then through words" (1962:150). He contended that thought, meaning and word all combine in a complex interplay with one another and form a dynamic relationship.

A continual movement exists between thought and word and vice-versa but according to Vygotsky, "Thought is not merely expressed in words it comes into existence through them." (op cit:186).

When EAP practioners are asked to describe the nature of the learning problems, they emphatically say that students have "conceptual and language" difficulties. When asked to elaborate on this, they, without exception, say that they are uncertain as to whether the cause is conceptual or linguistic. Language and cognition have come to be regarded as totally inter-related : a deeper theoretical grasp of this relationship should inform how learning problems should be addressed.

Second language acquisition

Since the academic, language and communication needs of second language speakers are the subject of this study, an understanding of the acquisition of a second language is important. How a second language is acquired has been the subject of several theoretical studies (Littlewood 1984, Schumann 1978, Lamendalla, 1979, Krashen 1987, Hatch, 1980).

Four theoretical models can be cited from the literature : the acculturation model, the neurofunctional approach, the monitor theory and the discourse perspective (Larsen-Freeman, 1983).

The acculturation model offers us the explanation that the extent

to which the learner is motivated to acquire a second language has a bearing on the acquisition process. Whether the learner has functional needs or social needs in learning the language determines the internalisation or integration of the language.

The neurofunctional approach argues that input (verbal or written) is transformed by some sub-sections of the central nervous system to produce a modified output-physiological approach - the LAD of Chomsky is subsumed in Lamendella's neurolinguistic neurofunctional systems.

The monitor theory makes a distinction between acquired and learnt knowledge. Acquired knowledge takes place when the learner participates in natural communication which provides, what Krashen (1987) terms "comprehensible input". A condition for acquisition is that the input should be slightly beyond the current level of competence of the learner. "Adults have two means of internalising "rules" in a second language."

Acquisition is sub-conscious , similar to child language acquisition. Learning is conscious. It is 'knowing about' a language, or 'formal' knowledge of a language" (Krashen, 1987). Learnt knowledge derives from the conscious study of the formal characteristics of the language.

The discourse perspective theory simply suggests that language grows out of conversational discourse (Hatch, 1980).

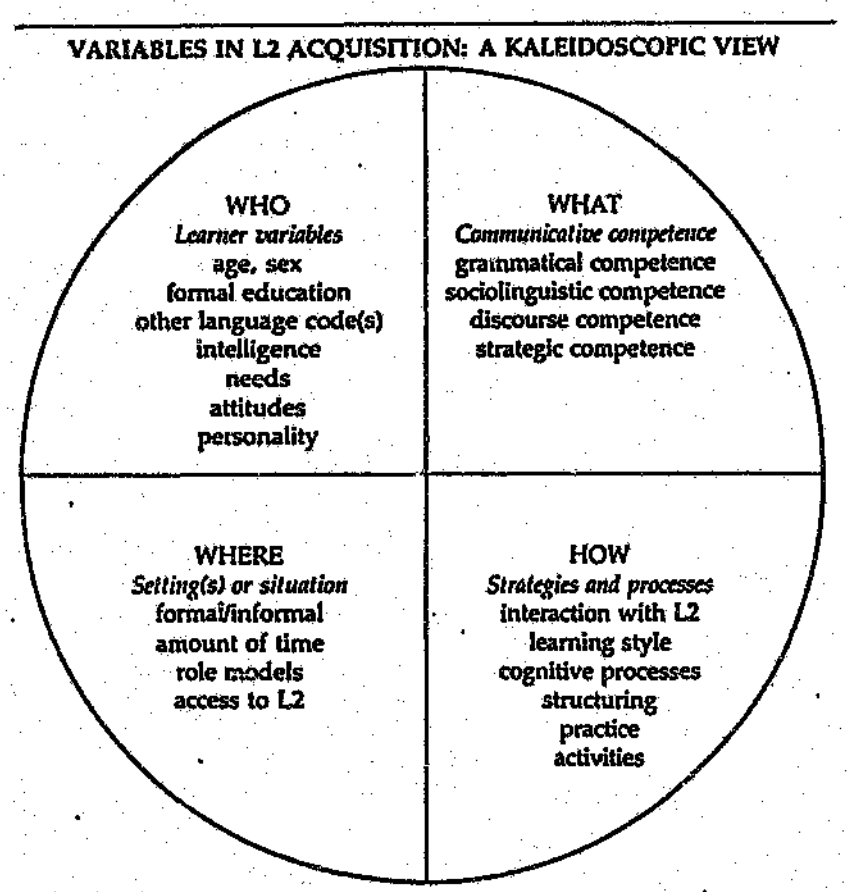
Larsen-Freeman (op.cit) claims that each of the four theoretical positions goes some way to explain aspects of second language acquisition but that they leave out the cognitive strategies employed by learners. The latest moves towards content-based instruction (Brinton, Snow and Wesche, 1989) seek to address this gap. (elaborated on pg 21)

Much of the literature attempts to understand rather than explain (Ochsner, 1979, in Larsen-Freeman) the process of second language

acquisition. The research as yet does not point to definitive processes or steps behind second language acquisition : "No theory yet developed by linguists or psychologists can account satisfactorily for children's language learning ability" (Baugh, 1988:67). The literature merely presents us with tentative factors which might aid acquisition.

These factors are to do with the age of the learner, the exposure to the target language, the kind of setting that the learning takes place within (ie formal or informal), the stage of development (conceptual) and motivation of the learner and the extent to which reinforcement is provided for the learner (Ingram, 1975).

Sauvignon (1983) has neatly condensed the above factors into the four categories of the **"Who, What, Where and How"** of the second-acquisition process (Fig 1).



Many of the techniques used to teach a second language at tertiary level are behaviourist and make the assumption that since the concepts have already been developed, much of the second language work involves the translation of these into different linguistic terms.

This assumption might not necessarily hold for us in South Africa. Given the nature of science instruction in black schools, learners have not acquired well developed scientific frameworks, either in the mother-tongue or in the second language to allow for the smooth translation of terms and concepts. Furthermore, there appear to be differences in the structures of Indo-European and African languages (Case, 1968, Strevens 1976). The latter do not appear to have key scientific concepts and terms, the vocabulary is limited and neither do they include the full range of connectors, prepositions and articles to enable the communication of meaning as required in the scientific medium.

Therefore, the problem cannot be conceived in simple second language translation terms; the remediation and expansion of content and appropriate language needs to be examined at the same time.

Any language intervention in South Africa would need to take the above factors into account when designing a course and when looking at comparative work done elsewhere.

The Communicative Language Movement

Since ESP is concerned with developing learners' linguistic competence in order to convey meaning in written and oral forms, there is a natural marriage between ESP and the Communicative Language Teaching (CLT), (Maurice, 1987, Williams, 1981). Brumfit, (1984) gives the following reason :

"It is clear that an ESP course is directly concerned with the purposes for which learners need English, purposes which are

usually expressed in functional terms. ESP thus fits firmly within the general movement towards "communicative" teaching of the last decade or so".

CLT has been influential since the early 70's. The CLT revolution argued that it is not enough to teach language in terms of its grammar and vocabulary and emphasised the need to go beyond the simple manipulation or mastery of linguistic items and structures. The CLT approach stresses the need to "develop strategies for relating these structures to their communicative functions in real situations and real time" (Littlewood, 1981).

Communicative teaching, therefore, aims at the activation or extension of the grammatical competence already acquired by learners, for real-life use in particular areas of activity such as social discourse or academic study.

Opportunities are consciously created to link language for communication since "Linguistic competence involves not just being able to communicate meaning but, in that process, conforming to linguistic (ie grammatical and lexical) norms as well" (Prabhu, 1987:69).

Linguistic competence is developed by setting learners tasks which "enable them to achieve, in due course, grammatical conformity in their use of language. Grammatical conformity in language use is thought to arise from the operation of some internal system of abstract rules or principles, and it is the development of that system that task-based activity is intended to promote" (Prabhu, 1987:69).

In short, the generation of meaning via language is the primary concern. Prabhu explains that, in addition, this approach allows the development of an internal system of rules for language acquisition as all "meaning-focused activity involves learners in making sense of various pieces of language in the course of understanding the information provided, interpreting the

teacher's questions or instructions, working out a solution, or mentally following an exchange between the teacher and a fellow-learner" (Prabhu 1987:69). Language is acquired through use rather than through separate language learning exercises, ie, "form-focused activities" such as labelling diagrams or completing a close paragraph.

The teacher's role is to facilitate meaning-focused activities by creating as rich and authentic a learning environment as possible (Blacquire 1987).

The basic contention of CLT is that grammar can be acquired in natural teaching settings without explicitly teaching grammar. If the need arises for explaining grammar, it is done in a way that associates the "rules" to the purpose of communication.

In South Africa, this debate is of profound importance since many of our secondary school learners, who have achieved a matric pass in English, have not acquired the basic level of competence required for tertiary study in a particular academic field.

For a communicative approach to succeed, skilled teachers are required to bridge the gap between base-line competence and communicating in an academic context.

2.1.3 Content-based instruction (CBI): the integration of language and content

It was Cummins' (1984) work that gave the theoretical rationale for the integration of language and content instruction. In exploring the relationship between language proficiency and academic achievement, he draws upon two continua: "context-embedded" versus "context-reduced' communication and "cognitively-demanding" versus "cognitively-undemanding" tasks. He places the former on a horizontal continuum and the latter on a vertical continuum. **Figure.2**

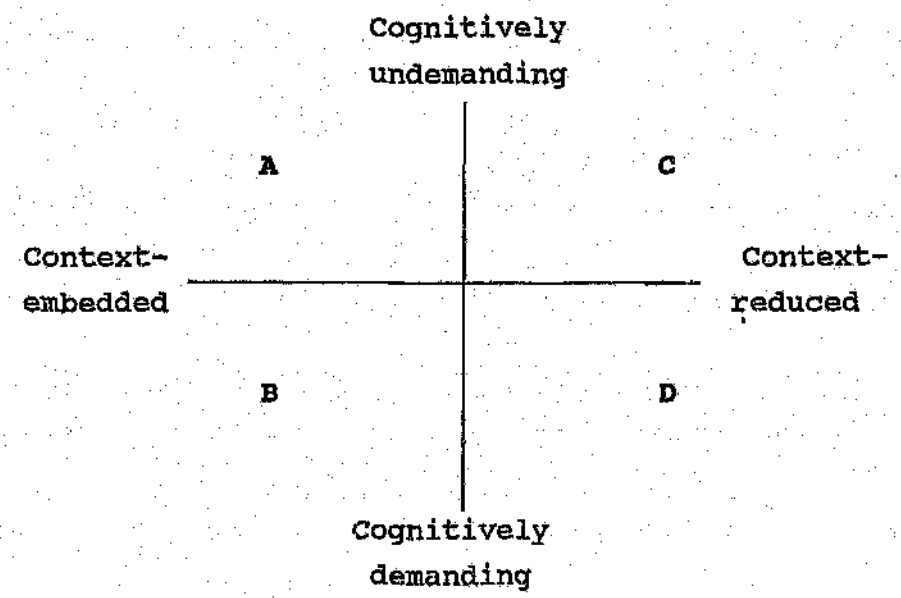


Figure 2: Range of contextual support and degree of cognitive involvement in communicative activities.

In context-embedded communication, learners can convey and negotiate meaning quite easily as this type of communication is supported by many meaningful linguistic cues (typified by everyday communication). Context-reduced communication, however (such as academic writing), relies upon "linguistic cues to meaning and thus successful interpretation of the message depends heavily on knowledge of the language itself" (op.cit, 1984:24), rather than the shared reality of everyday communication and is much more demanding.

The vertical continuum addresses the degree of cognitive involvement that a task requires. Therefore, he classifies quadrant A skills as basic interpersonal communication skills (BICS) which are context-embedded and cognitively undemanding. Quadrant D skills are context-reduced and cognitively demanding, a type of proficiency which he labels as cognitive academic language proficiency (CALP). Academic reading and writing tasks which require learners to rely primarily on the written word for meaning is an example of CALP.

The cognitive demands placed on students are intensified when they have to study in a second language. The situation for many of our South African students whose schooling falls under the Department of Education and Training (DET) is further compounded by the lack of the development of CALP type skills and the predominance of rote-learning or BICS type skills. In attempting to prepare our students for the academic demands of tertiary education, the explicit teaching of CALP skills in the context within which they will be used (ie, the context of the discipline), in other words a content-based approach would seem to be appropriate.

Increasingly, there is a move away from courses in which language skills are taught in isolation from the content of the learner's chosen discipline. (Chellapan 1985, Bhatia 1985, Mohan 1986, Gunawardens and Knight 1986, Robinson B 1985, Shih 1986, Driver and Riordan 1992).

In a content-based approach, "the focus is on the kind of cognitive and instructional tasks and activities learners encounter in their content classes" (Richards and Rodgers 1987 : 49).

The argument that has been put forward for this approach is that the language skills approach incorporates a small part of the learners' total language needs and that the relationship between language skill and academic achievement is crucial for the successful performance in the learners' chosen discipline.

Snow et al (1989:202) present four reasons for an integrated approach :

a) An integrated approach brings the three domains of language, cognition and academic development together.
b) Integration allows for meaningful and purposeful language learning for effective

communication within particular academic contexts.

c) By using content material in language classes, the learner becomes motivated to acquire the necessary language skills required to perform the task.

d) Subject-specific registers are acquired more rapidly as the content naturally conveys them.

Snow et al (op.cit) argue that the success of immersion as a model of foreign language education has provided strong evidence for the effectiveness of language learning through subject-matter learning. Brennan and Van Naersan (1989) stipulate that the more co-ordination there is between the learner, the content lecturer and the ESP teacher, the more likely it is that a qualitatively richer learning as well as language experience is offered.

The settings for content-based approaches can vary a great deal but Brinton (1989) describes three pre-dominant content-based approaches: theme-based instruction, sheltered content instruction and adjunct language instruction; it is useful to consider these before elaborating on the factors identified in this study.

According to Brinton (op.cit) **theme-based instruction** entails instruction in which the course is organised around a theme or topic rather than any other organising feature such as a grammatical syllabus. The EAP tutor would choose a topic as a vehicle for focussing on language development.

Sheltered content instruction is done in classes in which students study content through a second language. This would mean that mainstream staff are sensitised to the academic skills and language acquisition process and to the students' language needs. Within this approach, the content is not in any way watered down,

skills aquisition would occur through content mastery and the main focus is on content rather than language.

Lastly, **adjunct language instruction** involves an approach in which students are enrolled in concurrent content and language classes. The tutorials are team taught and the content courses provide a departure point for the language tutorial. The students are required to master academic and language skills which are necessary for success in the content area.

Generally, in exploring the differences and similarities between ESP/EST and CBI, it is evident that they share a common philosophy that is informed by the needs, backgrounds and interests of the learners. (Brinton, 1989)

Johns (1992:71-75) argues that CBI and ESP both departed from the tendency to abstract language from its natural environment. They both combine language use with an emphasis on discourse-embedded language usage. Authentic materials, tasks and language environments are used as vehicles for achieving the teaching goals. In addition, cognitive skills and critical thinking are considered to be part of language teaching.

According to Brinton, CBI courses differ from traditional EAP/ESP courses in that they incorporate an integrated, all-skills focus. She suggests that the difference is " unlike the linguistically oriented and text-based research of ESP, CBI is concerned with the immediate classroom ie, materials / curriculum design, instructional strategies..." (op.cit:9)

She also claims that CBI "consists of a broad-based inquiry into academic knowledge, with a particular topic chosen not as an object, but as a **vehicle** of study." (op.cit:9)

Thus, the characteristics of content-based or integrated approach can be summarised as follows :

a) learner needs are defined in terms of tasks and activities which characterise learning in content areas;

b) language learning is viewed in terms of proficiency, that is, as the skills needed to use language for different kinds of educational purposes;

c) there is integration of language learning and content learning " (Richards and Rodgers, 1987:49).

However, there are a number of staffing and practical implications which are highlighted in the literature and need to be taken into account before the above approach can be implemented in the form of integrated language courses. The ones which relate to engineering contexts have been especially selected given that the case study in this research is engineering-based. The next section concentrates on these factors.

2.1.4 Staffing Considerations of Content-Based Engineering Courses Internationally.

Most language specialists have a background in the Arts and are often called upon to serve the needs of science students. However, five content-based projects outside South Africa, (University of Newcastle, England; University of Surrey, England; University of Moratuwa, Sri Lanka; University of Technology, Papua New Guinea and Nanyang Technological Institute, Singapore), found that language specialists could not successfully address the needs of second language learners without collaborating with subject specialists (Bhatia, 1986, Dudley-Evans, 1984, Gee et al 1984).

It is instructive to look at their experiences in some detail:

two of the institutions are based in an English-speaking country; the other three institutions are based in countries where the everyday language is not English. The important distinction to bear in mind is that in the first two institutions students are exposed to communicative English in a natural way whereas at the other three institutions the language and academic skills have to be acquired in a second language setting.

Two major points of significance emerge:

(a) even in a first language setting, it was felt that language specialist teachers could not address the needs of second language students without the help of subject specialists.

(b) despite the different levels of instruction at these institutions, noticeable improvement in student performance was only achieved after collaboration between the two specialists.

Institutions in an English environment

At the **University of Newcastle-upon-Tyne in England**, the Civil Engineering departmental staff attempted to teach language and communicative skills to their students over a period of ten years and found there was little improvement in the quality of the work. The Department considered asking one of the linguists in the University to provide a course but rejected this option for two reasons: " because of the difficulty of matching the interests of the lecturer with the needs of the students and also the problem of motivating engineering students to attend what they would see as language classes."
(Jackson and Price,1981:37)

A new course was devised based on collaboration between the subject specialist and the linguist, which has proved to be very successful- leading to a marked improvement in the work of the students as compared with previous years. Furthermore, the course is now being offered to native as well as overseas students. The

conclusion that was drawn from their experience was that "language teachers invited to 'do something about the students' language' and working in a vacuum are inevitably plagued by doubts about the relevance of what they are doing and frustrated by the students' lack of interest. Thus neither the engineer nor the linguist alone can solve the problems satisfactorily" (op cit:37/38).

The Civil Engineering department at the **University of Surrey** has a high proportion of overseas students. These students, in technical terms, were as well qualified (students are selected on the basis of their A level results) as the home students but do not have a comparable proficiency in English. The Engineering department worked with the English Language Institute and has devised a communication skills course and a language support course. Close co-operation with the subject specialist was sought to identify language problems which affected academic performance and to define the target level of competence.

The initial content material was identified and supplied by civil engineers and the language and communication components were built around this. The teaching took place in the form of group discussions, workshops and tutorials. The latter were arranged separately:

(a) with subject-specialist staff to deal with problems related to understanding of the subject matter;

b) with language tutors to deal with problems of presentation, organisation and with language problems in general.

Student motivation was high because the subject was "part of the degree course work and therefore more meaningful" (Gee et al, 1984:119). They were carefully monitored and the study of language in the context of relevant/well chosen subject matter made them realise "why it was necessary to know the English language well" (op.cit:124). The success of the joint work between the two specialist fields of EFL and a Civil Engineering

department has been attributed to the following factors:

willingness to collaborate on the part of both sets of staff;

clear demarcation as to where their respective responsibilities lie;

awareness of each other's conceptual apparatus nd teaching approach and;

the joint effort being viewed by the student as a complementary teaching situation. (op.cit:126)

Institutions in a foreign language environment

The **University of Moratuwa in Sri Lanka** offers a diploma as well as a degree course in Engineering. Students are educated in the vernacular and study English as a subject up to GCE (O) level. Therefore, the Engineering courses are the students' first English-medium courses of study. The University's English Language Teaching Centre and the ESP unit of the Ministry of Higher Education established formal links and secured resources to develop a new language course for the students.

The course design process of the diploma course is interesting: the course planners found that published EST material was not suitable for local needs. They set up a team of course designers. This team included two British VSOs, an Engineer as well as a Graphic artist. The collaboration took place at the materials writing stage; the EST staff have the responsibility for the final form. Implicit in their approach is the belief that "the English teacher is not a disseminator of technical information" and, although the materials use technical content widely, the teachers are not expected to teach content but to "concentrate on assisting the students when they have problems expressing their ideas either orally or in writing" (Baumgarder et al:151)

At this institution, the team effort is harnessed at the course planning and selection of materials stages so that the course "will help the English language and subject area teacher, at

least in part, to feel that their particular interests are both fully considered and welded together." (op.cit:151)

At the **Papua New Guinea University of Technology**, language specialists have been actively engaged in implementing aspects of the language across the curriculum movement which argues for the active and explicit use of language in every subject classroom. The linguist and the engineering specialist " are of the opinion that this close co-operation between subject and language lecturers provides a better overall learning package for the students concerned." (Robinson, 1985:76)

Choice of content, level and appropriate language tasks were enhanced as a result of joint consultations. Although this particular course is not team-taught, a number of the other language courses at this institution include team-teaching as a strategy. Eliciting the advice of the subject specialist has enabled the linguist to synchronise extracts used in the language classes with content covered in the subject course, thereby increasing the topicality of the language course for the students. The linguist in this project mentions another valuable spinoff arising from the joint work: he is consulted on the format of specialist examination questions as a matter of course. (Robinson,1985)

At the **Nanyang Technological Institute in Singapore**, the language staff are official members of the Engineering departments. The collaborationist approach has been taken to its logical end point: the language staff " take part in the life of the Schools and are therefore totally immersed in the discipline. Working together with their engineering counter-parts is a natural outcome of "the process of socialisation into the sub-world of engineering" (Yin and Cheung, 1986:68).

The high status given to the language staff has led to professional respect and a working relationship which has meant that engineering staff are fully involved and participate in the

language and communication course "playing the role of specialist informants" and the course "complements rather than supplements the engineering subjects" (op.cit:68) Their team-teaching concept developed from the recognition that the knowledge gap between the subject and language specialist is very wide and that ESP practioners need to offer a form of language learning which is "closer to the immediate needs of the learners." (op.cit)

The language staff in all the above mentioned projects either team-teach or work collaboratively in designing the tasks in the language course and as a result, all the projects report a higher level of motivation and interest displayed by learners as a result of this approach. In addition, language specialists are not plagued with the inevitable doubts about their credibility in a "foreign" discipline.

A cautionary note

Richards and Rodgers (1987:67) have made a powerful criticism of the field of language teaching when they argue that : "Program or curriculum development in language teaching has not typically been viewed as an integrated set of processes that involve careful data gathering, planning, experimentation, monitoring, consultation and evaluation."

They argue that "rather, simplistic solutions of the process, for example by advocating changes in teaching techniques, methods, learning styles, technologies, materials or teaching training" tend to predominate within the field of language teaching (op.cit).

They propose a more comprehensive view of language learning which involves a more conscious and planned response; one which takes all the elements above into account when designing a language course rather than taking a micro view of language learning.

The literature would appear to support their view strongly if not

emphatically. In South Africa, the need for designing courses which develop sound English language skills in second language learners who will eventually make up the majority of tertiary level students is bound to persist and grow rapidly. The literature on language instruction would seem to suggest that language development, ideally, should take central cognisance of the requirements of the learners'discipline (ie, its register, discourse patterns, groundrules etc), and combine a task-based, communicative teaching methodology, incorporating content-based subject material with a degree of collaboration with subject specialists.

2.2 Part 2: Literature Search: South African Educational Context

The Lack of Articulation between Schooling and Higher Education

In schools

In South Africa, racial segregation, discriminatory financial policies for educational provision and the creation of multiple educational authorities has meant that there is a wide disparity in curricula content, teacher qualifications, standards and assessment procedures in schools.

Consequently, African second language speakers under the Department of Education and Training (DET) receive a generally poor quality secondary education due to shortages of basic resources and qualified teachers. Teachers use rote-learning methodologies and learners adopt an uncritical, non-assertive approach to their education which hinders their cognitive development. Memorisation is the predominant mode of learning at the expense of real understanding of subject matter.

At university level

For disadvantaged and underprepared students, the wide disjuncture between the content, level, pace and volume of work

expected at school and at university levels makes the transition very difficult since the degree of under-preparedness is considerable.

Whilst possessing the required paper qualifications, they lack some or all of the following: the academic skills, learning approaches and linguistic competence as well as content knowledge required by the particular academic disciplines as base-line competencies.

2.2.1 Language and Science Instruction in South Africa

In DET schools the standard of language and science subjects teaching is unsatisfactory. The standard of science teaching is very low so that the students' scientific knowledge is not very well developed by the time they leave school. (Kahn and Rollnick 1991, Christie 1985, Agar 1991, ANC;ISTG 1992)

Changes in language policy (Chick, 1992), (ie switches in the medium of instruction) over the past twenty to twenty-five years have exacerbated the language problems of students whose home language is not English on entry to English-medium institutions at tertiary level. This has meant that students have not received sustained mother-tongue instruction after the first four years of schooling, nor have they been taught science through this medium.

MacDonald (1988) reports that primary school pupils have to cross a wide gap when they switch from the vernacular to using English as a medium for all subjects. Quite abruptly, at an age of 11, they have to study ten subjects using English as a medium of instruction, from having studied English as a subject amongst several others in the previous year.
The linguistic switch is simply too demanding for all concerned:-
" we found anxious teachers who were struggling to get their children to understand difficult concepts in English, teachers who were racing against the clock to get their lessons

finished..." (op.cit:3)

The lack of consistency in language policy-making and implementation has meant that learners have not had a chance to fully develop scientific conceptual frameworks in any one language or to acquire basic language competencies in English. Despite all these disadvantages, some students from the DET system do gain matriculation passes in their science and language courses.

Implications for students

At the historically-white institutions, second language learners' level of academic achievement in English (as well as subject matter knowledge) is judged by comparison with first language English speaking students. However DET, English -Second Language (ESL) learners have not been exposed to this standard and type of English and often feel that any intervention which separates them for special needs is a slight on their potential and therefore unwelcome even though their school English does not serve them well at tertiary level.

This attitude, partly, has its roots in the way traditional school curricula for all students are organised as well as teacher education. (Bruckmann,1983). At school, learners are taught that there are the Arts and then there are the Sciences. Depending on their inclination and aptitude, matriculants are encouraged to choose decisively between the Arts or Science based courses at a higher level.

Present school curricula do not incorporate an English across the curriculum methodology which values and recognises that a medium of instruction should be reinforced in all subjects.

A shift is slowly beginning to take place in curriculum and policy planning: a recognition "that good functional English is just as demanding on skill and intellect as literary English.

Pupils should not be advised to take science and technology merely because they are not good at languages." is gaining currency. (Bruckmann op cit:35) However, practical spinoffs of a language across the curriculum policy will take some time since curriculum development and teacher training along these lines have yet to be widely implemented.

At tertiary level, too, the common perception of English held by science students is that it is a cultural, literary and soft subject; they view it as a subject to dispense with at matric, alongside Art and History. Passing at matric is a testimony to their competence and as far as they are concerned they have parted company with the Arts, the soft options, and are serious scholars.

" English as taught at the English language universities tends to be literature orientated. In many cases this affects the attitude of teachers to language skills - they reward pupils writing imaginatively and 'creatively' while those who give accurate and clear accounts are often labelled pedestrian or unimaginative. At secondary schools the view that literary English is the most important aspect of English is reinforced by the emphasis on preparing students for entry to the humanities at the university" (op.cit:35)

In an interesting study (Jiya: 1993) conducted at the University of Fort Hare on science students' perceptions of their language problems and how they should be addressed, numerous examples of the type of language and cognitive difficulties are cited, such as how English is spoken and used in the process of discussing scientific concepts, language as a tool in communication and accessing information from textbooks. (op.cit:82)

However, when confronted with the options of taking formal courses to address these difficulties, students were reluctant. Such courses would "infringe on precious time" and the additional justification was that they " did not do well because natural

science is a tough option because of the gap between school and university and because of problems with scientific reasoning and with the tentative nature of science." (Jiya:83)

Implications for language and subject teachers

Most teachers in the DET were trained under Bantu Education, when the vernacular was used until standard 6, they therefore, lack proficiency in English and are ill-equipped to teach through the medium of English.

English as a medium of instruction for the majority of ESL learners is practised by teachers who have received little or no training for teaching their subject to second language pupils. For these teachers, English is often a second or third language which further compounds the problem.

The Soweto English Language Research Project's experience is that " Bantu Education has not provided teachers with the English language skills necessary to teach in a second language.... and as a result, teachers are feeling ill-equipped and uncertain about what to do in classrooms.... other problems such as no reading matter- even for the teachers in some cases, huge classes (often over 60), low salaries and lack of teaching aids don't make their task any lighter." (SELRP, 1982:10)

In a survey of teachers'opinions on language use, Bot (1993:3) reports that in schools which used an African language and English, a substantial proportion of teachers (96%) was not primarily fluent in English. In English-medium schools, this applied to 37% of teachers.

It is not suprising that these teachers do not feel confident in English (McDonald, 1988) and switch to the vernacular in the classroom. Since scientific discourse itself, is not well-established in the vernaculars (Case, 1968, Towse 1977, Jardine 1986) this does not lead to a scientifically literate school-

leaving population. The English language, as a subject, is also not taught well or for communicative purposes.

Despite the odds, many DET students do achieve matriculation exemption and gain admittance to tertiary education. However, neither language proficiency nor scientific competence can be assumed given the school backgrounds of the learners.

Redressal of the problem in this case is more complex than for French second language learners studying engineering in England who basically need to be able to translate the concepts and expand their vocabulary (Kotecha, Rutherford and Starfield,1990). In our context, bridging has to be provided in science/ engineering subjects as well as in language/ academic skills. This has implications for course design and methodology of an EAP course because understanding of subject matter cannot be assumed. At any one time, our learners could be experiencing conceptual or language problems or indeed both. (Kotecha, 1991:166)

Leading theorists like Widdowson (1987) refer to " a universal underlying structure to different areas of scientific discourse which is neutral in respect of the different languages which are used to realise it." (op.cit:27).

What is often overlooked is that the types of learners referred to (like our French second language learners) have probably had a good early undisrupted grounding in education, which was compulsory and that their mother tongue has evolved to a fairly sophisticated degree.

Widdowson's assumption that " the student entering higher education will have already been initiated into these concepts and procedures as they are realised through his own language and through non-verbal symbolisation. Thus he already knows a great deal of how scientific communication is carried out through the use of the particular linguistic system of English. The task of the English teacher at this point, therefore, is to extend the

range of the student's communicative ability by making him aware of an alternative way of expressing the knowledge of science he already has" (op.cit:27) is not applicable for us.

This traditional ESP approach (a la Widdowson) assumes that students have studied science and acquired the basic scientific concepts in their first language and require assistance in expressing these appropriately in English. Our learners, however receive their science teaching in a second language from Standard

The theoretical brief from this dominant approach which advocates that " the English teacher's task is not to develop this knowledge but to demonstrate how it is realised through the medium of a different language" (Widdowson op.cit:28) cannot be applied in South Africa.

DET learners have been disadvantaged educationally, more specifically scientifically as well as linguistically. These learners have to acquire the language of the subject, general language/learning skills and the content of the subject simultaneously.

Therefore the theoretical and methodological approaches used in overseas courses and materials cannot be used wholescale since most of them take for granted the universality of language structure and a level of scientific competence.

Implications for EAP materials development.

Materials development has always occupied an important place in ESP literature. In any teaching situation, materials "are an embodiment of the aims, values and methods of the particular teaching/learning situation." (Hutchinson and Waters, 1987)

Materials make up the interface between the syllabus and the method: they enact the curriculum by means of smaller, focused,

meaningful activities. By engaging in activities, learners participate in a process of discovery of the knowledge and skills associated with a discipline.

Materials provide a framework for learning and teaching.
They are really the tools used by teachers to make explicit the aims of a particular teaching situation.
Thus, materials writing helps to clarify and sharpen the teaching process, especially where the writer and the teacher are the same person which is often the case in ESP.

In ESP teaching, it can be argued that materials are perhaps more critical since ESP is, by definition, a response to a specific learning demand or gap: ESP skills are not addressed in formal, established curricula and textbooks. The ESP teacher is highly dependent upon the development of additional teaching materials, since she is not teaching content matter per se. Thus, ESP has had to occupy this gap and has carved out a specific niche in the materials development market. (Block, 1991)

Sinclair (1978:99) discusses how "circumstances" and "informed intuition" of these circumstances tend to influence materials writing in ESP. The type of materials which need to be developed in South African learning contexts will have particular characteristics since they will be addressing a different type of problem to the second language problems experienced by students in many other countries.

Therefore, the notion of "informed intuition" of our own circumstances will have an even greater bearing on the materials writing process in the South African context.

Developing tailor-made materials does have many advantages since the writer can pitch them at the level suitable for the particular group of learners. Since in this kind of situation, the writer/teacher has a very good idea of the range of ability in the class, tailor-made materials have the added advantage of

flexibility. So, if certain skills need to be further practised, the materials writer is able to add to or to extend the skill/topic.

However, Sheldon (1988:238) gives materials developers a salutary warning when he remarks that, " it is a cruel paradox that for students, teacher-generated material (which potentially has a dynamic and maximal relevance to local needs) often has less credibility than a published textbook, no matter how inadequate that may be".

According to Hutchinson and Waters (1987), good ESP materials should contain interesting texts, enjoyable activities which engage learners' thinking capacities, opportunities for learners to use their existing knowledge and skills and content which both learners and the teacher can cope with.

2.3 Summary Issues from the Literature

What are the relevant pointers from the literature search for EAP practitioners in South Africa?

In summary, the literature search provides us with:- i) micro-level pointers for content-based EAP courses in our tertiary context and ii) offer macro-level categories for organising the rest of this study, ie, the case study and the broader investigation.

1) Pointers for the design of content-based EAP courses in South Africa

The literature indicates that the following factors need to be taken into account for the course design and implementation of content-based EAP courses in South Africa:

a) an understanding of language and the learning

difficulties posed by a particular discipline

b) a detailed needs analysis of the learners in question

c) a need to integrate the language, learning and content components of the discipline

d) an approach which combines the linguistic, communicative, cognitive and academic requirements of the discipline in question

e) the kinds of expertise which need to be harnessed in the design and teaching of an EST course

f) materials which reflect the above considerations

2) Five broad categories emerging from the literature search

An analytical reading of the content of the literature search offers the five broad categories of a) needs and perceptions, b) course design and approach, c) staffing/ expertise/ methodology, structure and consequently, d) evaluation. These are helpful overall categories which will be used as an organising frame or conceptual checklist device for the presentation of the South African EAP experience.

A Needs and Perceptions

Whose needs should be identified?
Whose needs should be given priority?
How should the needs of all parties be accommodated?

B Course Design and Approach

What view of language and cognitive development should be adopted for ESL underprepared students at tertiary level in South Africa?
How can a discipline-based, content-based course be developed? How can the appropriate skills be identified?
What kind of materials are required?
Which methodology should be adopted?

C Staffing, Expertise and methodology

What kind of staffing arrangements are necessary?

D Structure

Where should the course be "housed"?

Which kind of structural arrangements enhance the status and credibility of the course?

E Evaluation

Are the course objectives being met?

How will the effectiveness of the course be assessed?

How will student progress/performance be tested?

The macro-level categories from the literature search will be tested against the experience of one particular course as well as other EAP/ESP experience in South Africa.

CHAPTER 3: A CASE STUDY OF THE WISPE LANGUAGE AND COMMUNICATION COURSE

Introduction

Much has been written (Craig 1989, Agar 1990, Hofmeyer and Spence 1989, Millar 1989, Scott 1990) on the nature and effects of problems experienced by underprepared students in South African universities but relatively little on how they may be remediated in a structured and developmental way.

The following case study outlines the development of an EAP course in a chronological way, ie,

i from conducting a needs analysis to :
ii conceptualising a course outline or syllabus
iii implementing and piloting it
iv evaluating it to assess its strengths and weaknesses at tertiary level

This course has been in operation since 1987 and was developed over three years by the researcher in collaboration with subject specialists and merits documentation since it departed from the conventional practice of offering decontextualised language /academic skills support.

3.1 The Teaching and Learning Contexts of ESL Underprepared Engineering Students at the University of the Witwatersrand (WITS)

The problem

The failure rates in engineering for all students have been unacceptably high at Wits. "Only 25% of all students, and 6% of DET students registered in first year at Wits between 1980 and 1986 graduated in the minimum period of 4 years," (Jawitz, Kotecha et al, 1990).In 1986, the faculty decided to explore

ways in which to improve the retention and pass rates of these students.

Reasons for failure

The reasons for failure are wide-ranging: the Engineering syllabus is heavily content-based and all students have to grapple with new, often unrelated information, new concepts, differing lecturing styles, major time constraints and a totally different social environment. Successful adaptation to university study requires a high level of initiative, understanding and motivation and a rigid self-discipline to cope with the volume and pace of the work. An ability to make the best use of resources is also advantageous.

Moreover, the style of teaching within the faculty is such that the onus is entirely on students to take full responsibility for their learning in a system with large classes and limited individual attention. High student-staff ratios, lecturer-dominated instruction and the lack of personal contact with faculty staff require a radical shift from the learning styles in a school environment.

Besides the disadvantages with respect to formal education, underprepared students also experience social and economic disadvantage and do not have easy access to the amenities, benefits and knowledge taken for granted by the more priveleged students. These can act as restricting factors on their academic development, especially in high-status disciplines like engineering.
All these factors contribute to the high failure rates found in engineering at Wits.

The Nature of Under-preparedness and the Experience of Addressing it at the University of the Witwatersrand

The nature of underpreparedness in engineering was gauged by

investigating:-
a) the engineering staff' perceptions of learners' difficulties and;
b) the ASP's experience of meeting the needs of underprepared learners and its study skills course.

In ascertaining faculty perceptions and experiences of the academic problems faced by underprepared learners, the following became clear :

* " Lack of awareness of Engineering, lack of working knowledge of contextualised language and lack of problem solving skills" (Bruckmann, 1983:35) were cited as the three major problems that learners experience.

* A fast moving curriculum meant that underprepared learners were faced with a barrage of new scientific concepts without having a firm grounding in the sciences from school.

* The experience of the Science Faculty was cited. Their "slow stream" reduced-load option indicated that students do not necessarily make good use of free unstructured study time even though they are provided with ample time at their disposal. The assumption that " they would be sufficiently motivated to use the additional time, and indeed know how to use it." proved to be unrealistic in practice. (Bradley and Stanton, 1986:534)

Discussions with ASP staff indicated that :

* Since underprepared learners tend to work at a slower pace and require extra time to engage in extensive bridging activities, it was important for learners to spend adequate time-on-task (Agar, Hofmeyer and Moulder, 1991) for virtually every subject or at least on high risk courses.

* A concurrent form of support was deemed advisable as the skills and groundrules appropriate to the discipline and its curriculum are acquired in context; context-free academic support courses were proving inadequate, as students were finding it difficult to transfer skills into their own courses.

It was considered that the concurrent model would also improve the awareness on the part of mainstream staff. They would be sensitised to the problem and so improve their own practices. This process would neccesitate a fair amount of contact and exchange between support staff and mainstream staff to ensure that the support provided was immediately relevant.

* A sound educational approach was deemed necessary for successful remediation to take place. (Gerrans, 1986) Cognitive development in learners is dependent not only on what is taught but how it is taught.

  Research has shown that successful learners are those who systematically employ meta-cognitive strategies (Wenden and Rubin, 1987). Meta-cognitive processes involve thinking about thinking: MacDonald (1987) explains these as "control activities which are important for the solution of tasks or problems."(op.cit:5)

She elaborates upon what this means in practice by identifying five key processes;

> "1 Planning the steps to be used to do the task
> 2 Monitoring the effectiveness of the steps taken
> 3 Testing one's strategy as one performs it
> 4 Revising the strategy as the need arises
> 5 Evaluating the strategy for effectiveness" (op.cit:5).

In other words, a process of reflection and evaluation of task performance are important sub processes which take place in the

The pre-dominance of rote-learning strategies mean that these vital meta-cognitive abilities remain undeveloped.

Therefore, support teaching for underprepared learners would have to consciously address this.

* Since the ASP study skills course was specifically designed for underprepared learners, it provided a good starting point to gain insights into the remediation of rote learning strategies. It proved to be a general, fairly theoretical course which showed learners the processes behind key aspects of learning, eg reading, note taking. Attendance at and observations from the course led to the conclusion that the course offered a sound but subject-free meta-cognitive approach to studying.

The course offered valuable insights into the kind of broad learning skills which underprepared students need to acquire. But an analysis of how these skills relate to the demands of the engineering curriculum was subsequently necessary.

Why an Adjunct EAP Course for Engineering Students?: Background

In 1986, discussions took place between the Faculty of Engineering and the Academic Support Programme at the University of the Witwatersrand to address the low retention rates of first year underprepared students.

It was felt that these students required support around their language and learning needs as well as in their mainstream content areas. A language specialist was appointed to conceptualise, develop and implement an EAP course. At the same time the faculty was concerned about how best to address the need for academic support in the mainstream content areas.

Three main reasons were given for the development of an adjunct (Brinton, 1989) EAP course were given:

(Brinton, 1989) EAP course were given:

1. Second Language Speakers in SA need to develop academic/ language skills and need time in the undergraduate curriculum to practise writing and reading in English

2. The nature of Engineering discourse requires a particular form of communication which means that the visual, mathematical, oral and written forms all inter-relate to convey meaning.

3 There is great frustration within the Engineering profession which finds that graduates are unable to write or speak with the level of fluency and clarity that is required. The undergraduate curriculum needs to address this.

The prevailing form of academic support was to provide voluntary, supplementary tutorials for students over and above their normal heavy workload. The experience, in engineering and in other faculties was indicating that:

a) despite the provision of academic support in the first year, the normal length of degree structures was beyond the capabilities of underprepared as well as the majority of all students.

b) it was difficult to compensate for twelve years of educational disadvantage in one year of academic support.

Having assessed the problems associated with the prevailing forms of academic support, the faculty of Engineering with the assistance of the Academic Support Programme decided to establish an alternative, extended five year curriculum called The Wits Integrated Study Programme for Engineers (Wispe).

3.2 The Structural Context for the EAP Course: The Wits Integrated Study Programme for Engineers: Wispe

Course structure

An wholistic approach to academic support was Wispe's distinguishing feature. This was arrived at by analysing the Engineering curriculum in its entirety and determining the form and nature of support required by underprepared, second-language learners from the DET school system.

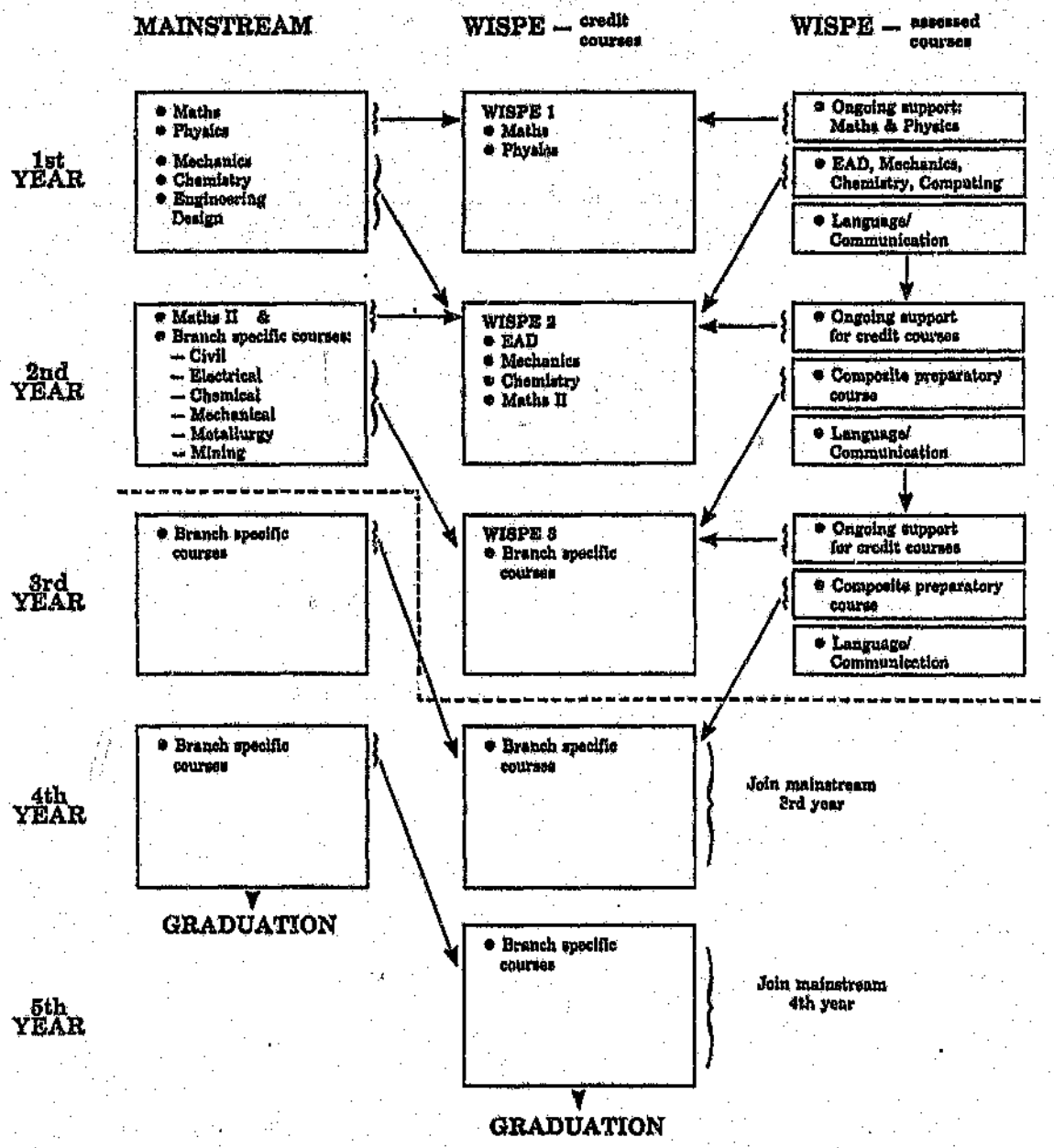
The first three years of the engineering curriculum have been re-structured by extending the degree from 4 to 5 years.
The subject courses in the first two years of the engineering curriculum were spread over three years. The remaining two years stayed the same as in years 3 and 4 of the mainstream four year degree. The changes amounted to fewer mainstream credit subjects in the first three years of a five year extended degree programme.

The extra time gained was utilised for the three components of the Wispe programme which were:

a) **a support component;** the inclusion of formal academic support courses for the content subjects,
b) **a preparatory component;** introductory courses designed to prepare students for mainstream courses which were taken in the following year of study and
c) **an academic/language skills course. (Figure 3)**

Students are invited to join on the basis of their April test results. First year Wispe students retain two mainstream credit courses and are enrolled for the three components of the Wispe Programme. In the second year of the programme, students complete the remaining first-year courses, do preparatory courses for second-year mainstream courses and continue with the academic/language skills course. In the third year of Wispe,

FIGURE 3: The Wispe Curriculum Structure



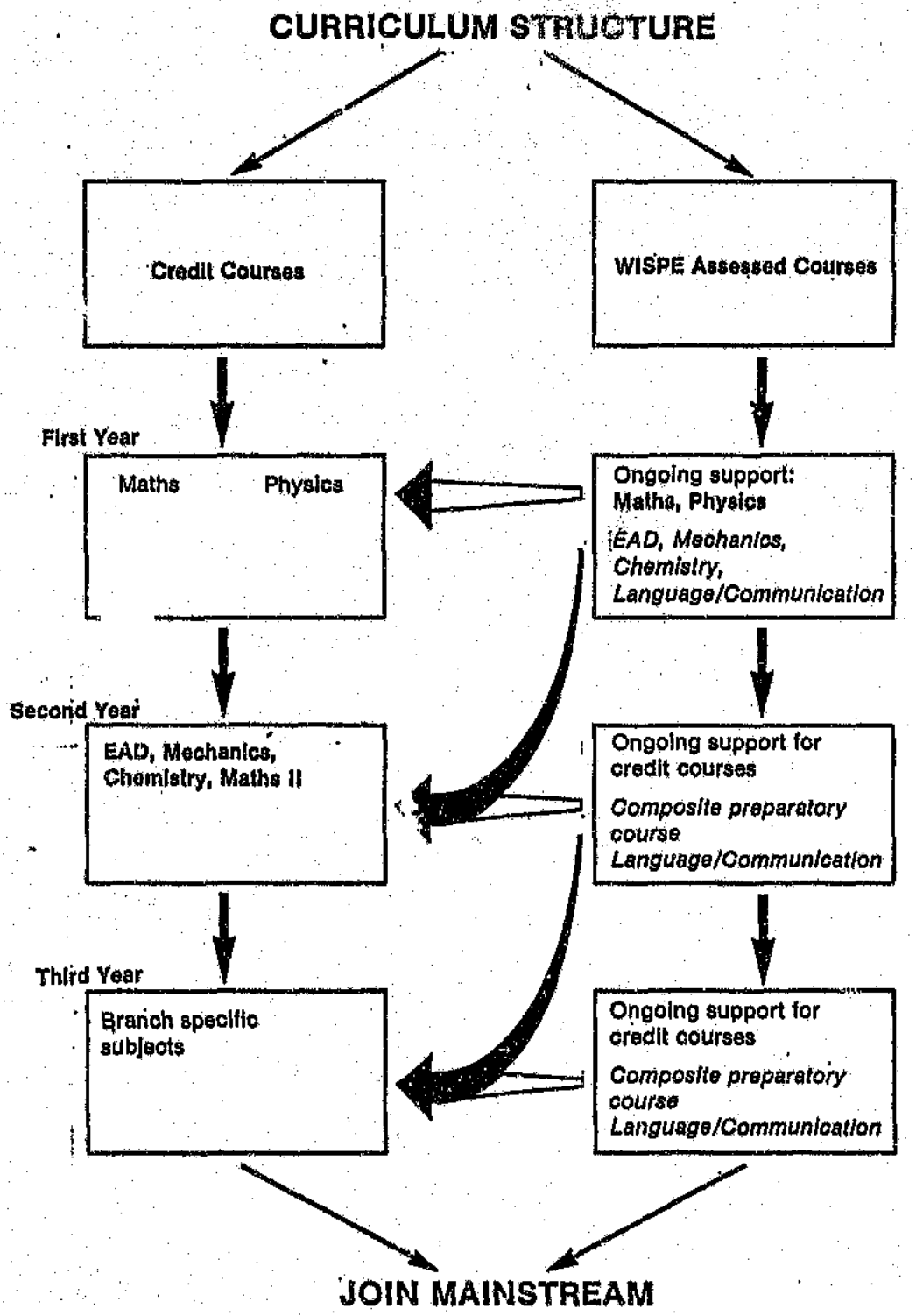
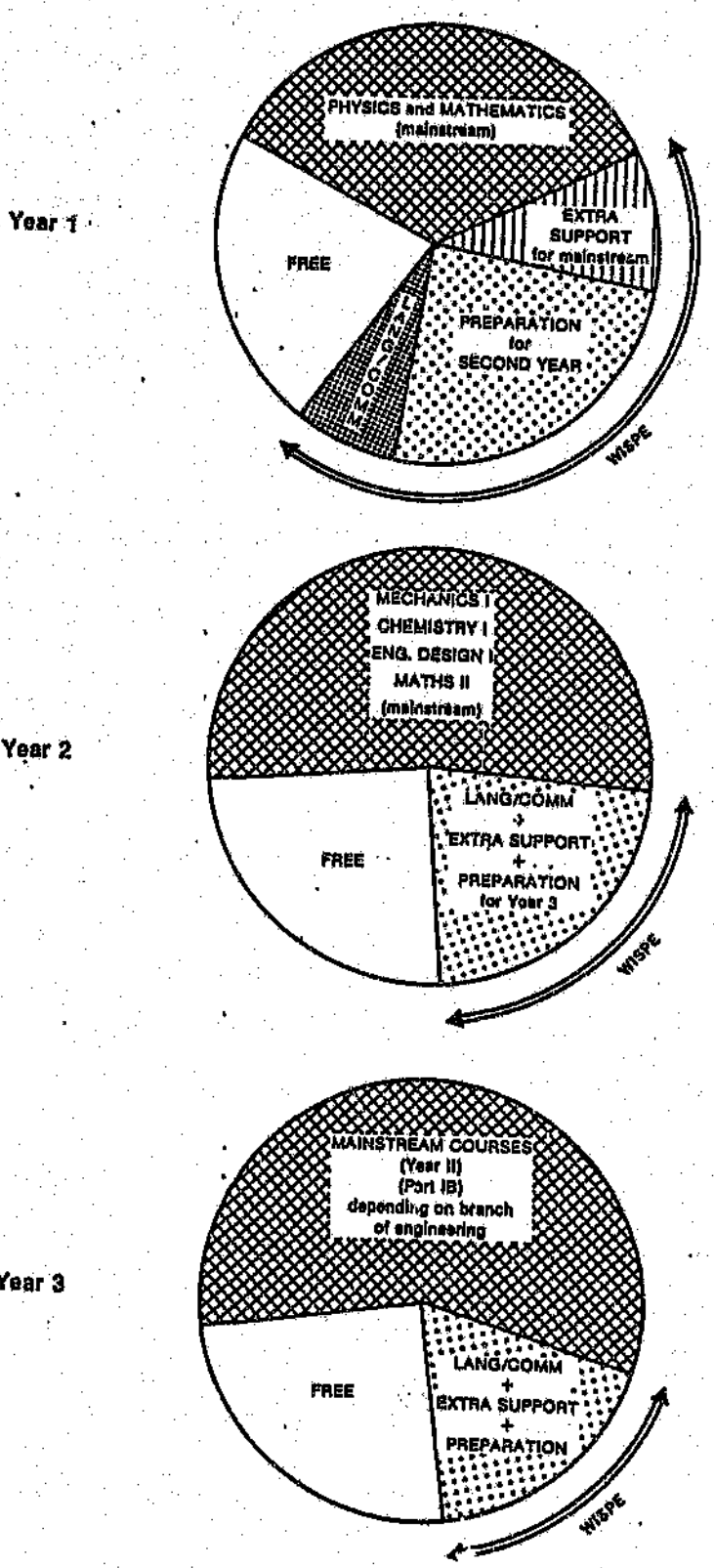

CURRICULUM STRUCTURE
Credit Courses
WISPE Assessed Courses
First Year
Maths
Physics
Ongoing support:
Maths, Physics
EAD, Mechanics,
Chemistry,
Language/Communication
Second Year
EAD, Mechanics,
Chemistry, Maths II
Ongoing support for
credit courses
Composite preparatory
course
Language/Communication
Third Year
Branch specific
subjects
Ongoing support for
credit courses
Composite preparatory
course
Language/Communication
JOIN MAINSTREAM

FIGURE 4: Proportion of Time Spent in Mainstream and Wispe



students do second year engineering courses specific to their chosen branch and receive additional assistance with them, while continuing with the academic/language skills course.

The programme was specifically designed to integrate academic support with the mainstream credit courses by offering a concurrent model of support. All these courses were non-credit-bearing but compulsory. However, course codes were ascribed to each course to give the courses and the whole programme a formal, official semblance. The programme was included and publicised in the faculty's official " Rules and Syllabuses" information booklet as a recognised alternate curriculum structure.

Proportion of time spent in Mainstream and on Wispe

In effect, learners spend time in the mainstream environment as well as within a highly structured and systematic support programme. The total contact time per year for Wispe students was approximately the same as for students on a four year curriculum. This arrangement was also favoured since it was felt that it best allowed the learners to become accustomed to the pace and pressure intrinsic to engineering study at Wits.

A considerable amount of time spent by the learners on specific Wispe courses in the first year. This time decreased in the second year and reduced further in the third year, with a corresponding increase in the time spent on mainstream courses **(Figure 4)**. The term "scaffolding" is used to describe the provision of support structures in learning which are gradually withdrawn. In Wispe, learners are offered a substantial scaffold and the learning tools when they start; on entry to their third year of the normal curriculum, they are expected to cope on their own after 3 years with Wispe.

Thus, a holistic, integrated curriculum which reduced the number of credits taken over a period of three years but at the same time enabled them to adjust to the academic environment was established.

Selection and enrolment

A "falter-first" approach to selection was used because students find it difficult initially, to accept assistance. When they eventually do, it is more often than not, too late. At the "open" universities mere acceptance is perceived by them as an affirmation of their ability. (Hofmeyer and Spence, 1989)

Engineering students write their first subject tests in April. These results provide the first indication of student performance in a university environment so that although this is at an early stage of students' academic career, the faculty believed that it was one of the better predictors of success at the end of the first academic year.

The selection process was based on the April Maths and Physics test results which were subjected to a discriminant analysis, designed to identify " at-risk" students who had a reasonable chance of passing by the end of the year. (Appendix 1)

The programme catered for 30 students: roughly 60-70 letters were sent to these "at-risk" students offering them a place on the programme. All interested students were interviewed and completed a biographical questionnaire. Priority was given to African students and if space allowed, a few places were offered to other, predominantly Indian, students.

Whilst enrolment for Wispe was voluntary, once a place had been accepted, attendance of all the courses and the tutorials was compulsory.

1987 was the first year of the Wispe programme in which students enrolled. After the first two years, approximately 60-70 students were enrolled on the Wispe programme and therefore the EAP course in any one year.

Staffing arrangements

Mainstream staff and post-graduate students were approached for the teaching of the subject-specific courses. They identified the typically difficult concepts and skills within the mainstream courses and used these as the core items for the development of the Wispe course outlines.

A lot of autonomy and flexibility was granted to the co-ordinator and the individual tutors. This was advantageous from the point of view that it enabled experimentation to take place but disadvantageous in that important decisions relating the choice of content, skills and approach were to be left to the discretion of the tutors at an individual level.

Since the extended programme was the first one of its kind, it was important to keep good records on attendance figures, to monitor student progress in the tutorials and to monitor aspects of overall course development and implementation.

For this purpose, each tutor was required to complete a tutor record sheet (Appendix 2) designed to note

a) the topic/aim of each tutorial,
b) the method used, and
c) comment on how the session had transpired and
d) the absentees.

Such records were considered important as they would assist towards an internal, formative evaluation as well as a long-term external evaluation of the courses and the programme as a whole.

The characteristics of Wispe can be summarised as follows:

A faculty-based programme
An integrated programme
An extended degree structure
Addressed retention and academic support beyond first year
Early identification of "at-risk" students
A steady group of learners(ie. they stayed on the programme for three years)
Voluntary enrolment, compulsory attendance
Instruction in problem-solving, academic/language skills for communication
Mediation in and preparation for content in mainstream courses

Implications for the EAP course

The Wispe format of academic support strengthened the position of the prospective EAP course from many points of view. It was part and parcel of a structured, programme which had an immediate network of engineering staff to consult and work with in a collaborative way.

The course would therefore not be marginalised; it was to have an official code and had the same status as the other content support courses. Its aims and objectives would be shared with the other programme staff who in turn could reinforce its aims. A three-year course meant that it was possible to devise a well-structured course which could provide learners with ample practice in the varied and numerous academic, language and communicative skills that they required.

3.3 Conceptualisation of the Course

In conceptualising the course, the kind of immediate and basic issues which required consideration were:

What kind of a course was required to equip underprepared students to become efficient learners in engineering?
Who should teach it?

How should it be taught?
What kind of content was desirable?
How would the skills and tasks be sequenced?
What kind of materials were required?

There were several constraints which needed to be taken into account before the course could take shape.

The Main Constraints

At Student Level

Students perceptions and attitudes towards a prospective EAP course varied a great deal. The mastery of content matter in the engineering was of paramount importance to them. These were students who were already struggling in their mainstream subjects and therefore a discrepancy was found between their perceived and actual needs in English.

Faculty Staff

Mainstream engineering staff were unequivocal on the need for the development of language and learning skills in under prepared students. As subject specialists they felt that they had no training in how to identify or to teach the language/academic demands of their courses. They were primarily appointed on the basis of their qualifications rather than on their ability to teach or lecture well. No educational training prior to the appointment was required. They felt that a language specialist was more suited to the task.

The Language Specialist

As is generally the case, the appointed person came from an Arts background in education and language training. It was evident to her that a fusion of the two very different disciplines of science and language would be necessary. However, difficulties

were posed in identifying subject specific staff who could work closely with the language specialist and provide input in the design of this new course.

The students clearly needed to develop their language, academic and communicative skills within the context of their discipline. The question was how to address these given the reported attitudes of the learners and the lack of expertise of the specialist in science/engineering.

If resistance rather an acknowledgement of their needs was likely, every effort would have to be made to devise a course which would enlist their participation and co-operation. A developmental rather than a remedial approach was favoured despite the fact that the rudiments of the English language had been covered unsatisfactorily at school level .

The Needs Analysis

Discussions were held with key Wits engineering staff to identify possible content and skills for the course. Simultaneously, an international literature search was embarked upon to find out about the type of courses which had been designed overseas. The information gleaned from the two sources was then formally translated into a course design.

As part of the needs analysis, familiarity with engineering was required to establish the kind of groundrules associated with this discipline, to acquire a "feel" of these.

The method behind the needs analysis was to interview engineers about their discipline, track (ie attend lectures and tutorials) and to workshop the precise range of skills which would be included in the course.

The Target Situation Analysis: Defining Engineering as a Discipline

A colleague in the Engineering faculty provided this definition of his discipline: " Engineering requires a knowledge of the mathematical and natural sciences which is gained by study, experience and practice and applied with judgement to develop ways to utilise, economically, the materials and forces of nature for the benefit of mankind."
(Bentel, 1987)

As a discipline, engineering is grounded in the sciences. Both scientists and engineers observe, understand and explain the principles of nature but engineers go beyond this shared perspective and use scientific knowledge to improve the world around us by inventing new devices that can serve people. Engineers **apply** the principles of science to construct dams, bridges, chemical plants, electrical grids and to extract minerals and metals.

The academic study of engineering involves the ability to solve problems. The combined skills of producing workable solutions within given constraints, drawing upon scientific theories, using mathematical and design procedures are required from an engineer.

The study of engineering at university is demanding and intensive. It requires a high degree of motivation, self discipline, sophisticated problem solving skills and a capacity for independent learning. A fast moving curriculum coupled with heavy workloads mean that learners need to employ efficient study skills in the context of a second language.

In 1987, no comprehensive EAP curriculum in SA which had been tried and tested in Engineering was available, therefore there were no models to follow. A few short communications courses were formally offered as part of mainstream curricula in engineering departments but these did not include language/academic skills

and were not geared for underprepared learners.

Having achieved a better sense of the subject and its groundrules the next task was to define more closely the necessary academic, cognitive, communicative and linguistic skills for studying engineering successfully.

Findings of the Needs Analysis

In answer to the above question, the skills of graphical literacy, contextualised language and communication:written and verbal (Kemp, 1983) were cited as crucial. The transfer and integration of information between the verbal, written, numerical and diagrammatic modes of expression are prominent features of engineering discourse and would require explicit teaching.
Essentially, the needs analysis highlighted the key organising principles of the development of problem solving, academic/study skills, contextualised language, and reading/writing in science/engineering. Although initially, the problem was felt to be predominantly a language one, the needs analysis suggested that the a range of learning skills would also have to be addressed and integrated into this course. Language skills development would have to be an aspect within the course but would not provide the sole focus.

The course would have to adopt a task-based teaching approach involving the use of authentic science/engineering subject matter. Academic skills would have to be integrated with engineering rhetoric.

The higher order skills of analysis (selecting relevant information from a pool of information) and synthesis (comparing, contrasting, arguing around this information) and the presentation of researched material could be expected towards the end of the course. The basic skills of listening, talking, reading and writing in an academic context would need to be mastered and reinforced at the early stages. Mastery of these

basic skills when combined with increasing the level of complexity of the tasks should lead to the mastery of the higher order skills.

3.4 The Course Design

Out of the needs analysis process, some clarity had emerged and a statement of intent had been articulated to alert all the parties which had contributed to this process of clarification of the stance taken.

The intervention was "to develop cognitive skills in Engineering using English as a medium to solve problems. Emphasis will be laced upon the discovery of processes in problem solving. English and study skills will have an implicit role in so far as students will be reading and comprehending problems and writing up solutions. Language, communication and academic skills will be integrated but the overall emphasis will be on **developing appropriate cognitive skills for communicative competence in the academic study of engineering."** (Kotecha, 1987)

The course designer, at this point found a subject specialist who was interested in team teaching the course. A workshop was organised to brainstorm the specific skills required by students. The help of three ASP staff members and engineering staff was enlisted to further refine the objectives. This produced a comprehensive list of academic and language skills which staff felt were important to develop in learners. Broad aims were arrived at first, followed by the discrete skills. The identified aims of the course, the approach and the skills are outlined below.

A: Course Aims:

1 To develop appropriate cognitive skills in Engineering students using English as a medium of learning

2 To emphasise the learning processes required in problem solving and to develop strategies to facilitate such learning processes.

3 To develop talking, listening, reading and writing skills for the purposes of
   a) Seeking, gathering and synthesing information.
   b) Problem identification, definition and solution.
   c) Writing and presenting reports
   d) Effective communication with engineers and non-engineers

4 To develop a critical awareness of the use of language in Engineering

5 To enable students to develop a self-confident, positive outlook of their own capabilities by encouraging active, critical and independent approaches to learning.

B: Sources for Contextualisation and Materials Development

1 The Language team tracked all Wispe courses to draw from and build upon the content and underlying learning/teaching processes.

2 Other related sources such as "New Scientist", "Engineering News", Escom publications, "Mining Survey" and Transport/Electrification-related journals and other popular engineering journals were used.

3 Engineering staff were also to be approached for ideas, data and case studies.

C: Skills

Six major skills areas were identified:

i) Reading

Students should be able to:
preview, skim and scan
comprehend reading material, ie, prescibed textbooks

elicit explicit/implicit meanings
for specific/general information
transfer and transform information
integrate concepts
identify arguments and supporting points
decode scientific jargon
analyse and synthesise various readings
spot inferences and logical connections
evaluate readings

ii) Writing

Students should be able to:
develop appropriate writing styles (structure and lexis)
practise clear, precise, logical writing
develop report writing skills
take useful notes
develop research writing skills

iii) Communication

Students should be able to:
ask questions
be aware of relation between answer and question
listen actively
rephrase questions
give explanations
present structured talks
structure communication in orderly fashion
be aware of audience and intent
talk at appropriate levels
initiate and participate in group work
communicate by graphical means

iv) Language Development and Contextualised Language

Students should be able to:
use language appropriately

use the impersonal, precise and objective language of science
use scientific registers
identify and differentiate between words used in a technical/scientific context and everyday contexts

v) **Conceptual Skills for Engineering**
Students should be able to:
be aware of the learning process
formulate effective learning strategies
develop lateral but logical thought
reflect upon, understand and evaluate one's own learning
encourage learners to overcome affective blocks
identify, explore, understand and synthesise
explore links between life experiences and academic theory

vi) **Problem Solving**
Students should be able to:
understand and identify problems
analyse and intepret data
synthesise information
present viable solutions." (Kotecha, 1987)

The identified skills and the approach chosen then had to be matched with suitable engineering content for teaching purposes.

Materials development

Several commercial textbooks were scrutinised but they tended to include topics like "Measurement", "Construction " and " Tools" which could broaden learners knowledge, but it was felt might not hold immediate appeal or interest for our learners. These overseas textbooks tended to emphasise cognitive and language skills somewhat repetitively and include many drill-like activities rather than open-ended problems, so it was felt that

materials which were more appropriate for our particular learners were needed.

Therefore, the quest for appropriate textbooks which would work in our context was abandoned at an early stage.
The course design had included materials development as an integral component of the team-teaching and contextualisation venture. The plan was to write our own materials using local, ie South African, engineering issues, concerns and topics as the content for the teaching and practising of the identified language/academic skills.

Materials development was therefore seen as the important link between the design and the implementation of the course and it was felt that considerable time would need to be invested in this area.

The limited engineering knowledge of the course designer would undoubtedly restrict the complexity and kind of tasks that could be set despite the anticipated involvement of a subject specialist. Therefore, popular non-technical but engaging engineering texts would have to be used.

3.5 Intended Methodology and Role of the EAP Staff

The adoption of the principles of CBI or contextualisation/ integration and team teaching appeared to be the only way to meet the constraints. Contextualisation would mean using science/engineering material to teach in an integrated way the identified skills.

Team teaching would mean collaborating with a member from mainstream staff who would be prepared to help the language specialist to develop the course.
In reality, team teaching was the most pragmatic option available for implementing an integrated approach.

The ionale for the two principles was based on the following points:

* The language specialist had a background in the Arts and the Humanities and would find it difficult, at least initially, to deliver content effectively from a discipline outside her training.

* It was known that students lacked competence in both science and in academic/language skills and would have difriculty in coming to terms with the latter problem. The presence of both specialists should enhance the face-validity of the course.

* The problem of lack of transfer of language/academi . skills into engineering would be minimised by taking the cognitive demands of the same discipline and using these as an organising principle to devise an EAP course.

The subject specialist would articulate the explicit and the implicit demands of the discipline to the language specialist; they would jointly develop a relevant course.

* Team teaching would enable the subject specialist to develop a sensitivity to and an awareness of language issues as well as to acquire the training in how to teach them and vice-versa. The language specialist would integrate content matter of the specific discipline with the academic/language skills.
Both specialists would plan the sessions together, develop materials and evaluate the course from their respective perspectives.

* Team teaching would improve the chances of well-chosen material because the subject specialist would be able to decide on the suitability of content and level.

* Greater ownership and sharing of the language problem would be made possible. Traditionally, language support has been firmly

located within academic support units or linguistics departments. Disciplines tend to relegate language/academic skills work to an outside "expert". Team teaching would enable the subject specialist to play a pivotal role in contributing relevant knowledge. Thus both specialists will gain additional expertise in an important area of educational development.

The findings of the literature search and the needs analysis helped to inform this rationale. Johns and Dudley-Evans (1980), based on their now, very well known, enterprise on team teaching emphasise the importance of "the triangular relationship" between the student, the subject teacher and the language teacher. Their justification for a team-teaching approach is that when learners fail, it "is rarely attributable to "knowledge of the language" or "knowledge of the subject" but that "these factors are inextricably linked".

A resonance was found between their justification of this approach and the course designers' reasons for opting the team-teaching route.

In addition, the two specialists would attempt to :

1 act as facilitators and create learning environments which encourage active participation/exploration of given material.
2 adopt a discovery/guided discovery method depending on the nature of the subject material
3 promote an inquiring, questioning and deep-level approach to a pre-determined body of knowledge
4 adopt learner-centred methods using peer groups
5 develop interactive teaching/learning strategies using creative science/engineering material
6 undertake 1,2,3,4+5 in **a team teaching or collaborative teaching context**

3.6 The Division of Skills over the Three Years of the EAP Course in Engineering

The three years of the course encompass all the afore-mentioned skills. The three years are divided in the following way:

Year 1 is devoted to the development of the basic academic skills. The areas which are covered are reading skills, both general and in the sciences, the structures of information in science, scientific register and vocabulary, listening skills, notetaking skills, library skills, time management, exam techniques and a unit on introduction to writing skills.

Year 2 has report writing and presentation as its overall focus. The different sections of a report, its parts, organisation and structure, interpreting data to use in a report, the role of graphics, coherence and cohesion in report writing, descriptive/ expository/discursive writing, features of scientific writing ie, the passive and the use of logical connectors, developing arguments logically, using appropriate register and giving oral presentations are covered.

Year 3 is based on project work. Various task-based engineering problems which require an analysis and synthesis of given data are set. The learners are expected to generate realistic solutions to these problems.

It was decided to call the course the Wispe **"Language and Communication" course.**
The development of language skills would not be addressed as a separate component but would be integrated, monitored and assessed in all three years. When particular language problems surface they would be addressed in context.

The overall objective of the course was to equip learners with the tools to express and present material clearly in writing and

in speech.

3.7 Implementation of the Course Design

The course has now been in existence for six years. The first two years were team-taught and up until 1990 the L/C course was a three year course. Subsequent to 1990, the course was condensed into a two year course.

How has the course fared in practice? What was actually implemented and how?
An overview of the range of topics taught and how they interfaced with skills development, materials development and task formulation over an actual three year period is presented in a condensed ... in **Table 1** below. The information was drawn from the numerous files containing records of tutor intent and implementation of each teaching session.

Table 1: An Overview of the Wispe Language/Communication Course Illustrating the Interface of Topics, Skills, Materials and Tasks employed in 1991

Year 1 WISPE Language/Communication course

TOPIC	SKILLS	MATERIALS	METHOD	TASKS
COMMON STUDY PROBLEMS	Identifying and taking responsibility for one's own study problems	Personal progress chart	Small group discussion Whole group discussion	Formulate objectives for studying more effectively
PRINCIPLES OF TIME MANAGEMENT	Using study time more effectively	Personal study timetable	Individual work	Complete the study timetable based on your own needs
ACTIVE READING	Understanding the reading process	OHP on "The Reading Process" and "Active vs Passive Reading" Scientific article on "The Magnetic Monopole	Elicitation and tutor input Timed reading and reflecting in pairs	Write down the information you managed to glean from the article. What does this tell you about the content of the article?
PREVIEWING, SKIMMING AND SCANNING	Reading quickly and efficiently Using typographic lines and layout of a text Identifying main points	Scientific article on "Four fundamental Forces" OHPs on "Levels of information" Chapter on "Heat" from 1st year Physics textbook	Individual reading - class discussion Tutor input and discussion Further individual practice at previewing Individual work	Write down the main ideas in each paragraph Under timed conditions, write two paragraphs on "Why does water in a canteen stay cooler if the cloth jacket surrounding the canteen is kept moist?"
STRUCTURE OF INFORMATION IN ACADEMIC TEXTS	Using information structures to determine authors intention and line of argument	Article on "The nature of reading in Science: the text and the task". Worksheet designed to enable students to access the structure of information in the article.	Individual reading Pair work Whole group discussion	Write down the headings for each paragraph in the table provided with the article

TOPIC	SKILLS	MATERIALS	METHOD	TASKS
SCIENTIFIC TEXT TYPES	Developing appropriate reading strategies for different text types	Information handout on the 7 main text types in science. Student worksheet analysing different text types.	Tutor input Individual work	Complete the chart designed to access information pertaining to each text type
ASSESSMENT ON ACADEMIC READING	Evaluating and testing std's reading abilities in relation to task accomplishments	Exam paper contained: Article on "Physics of the Food Industry". Selection of four text types from various sources and questions based on them. Article on "Airship Technology".	Timed (15 minutes) reading of text and answering questions Written answers in time conditions (1 hour)	Complete the reading and writing tasks in the exam paper
CHARACTER-ISTICS OF SCIENTIFIC WRITING	Identifying and using scientific register, sequence markers, specialist terminology, meaning in context and everyday vs scientific meanings of words	Handout illustrating characteristics of scientific writing, including exercises and free writing tasks	Tutor input Pair work	Complete the exercises and writing tasks in the handout

TOPIC	SKILLS	MATERIALS	METHOD	TASKS
NOTETAKING 1: FROM LECTURES	Determining relevant and irrelevant information in lectures. Listening for semantic markers. Listening for fact and opinion. Identifying the structure of a lecture, main points and examples. Developing strategies for cued and uncued lectures. Imposing one's own structure of information. Highlighting and abbreviation techniques. Developing criteria for useful notes and methods.	Students own set of Physics notes Handout of 3 different sets of notes Notemaking exercises and tasks of increasing difficulty Two taped mini-lectures on "Two theories of light" and "The four-stroke engine" Sample notes	Pair work comparison Small group work Individual work Individual and pair work	Determine which is the better set of notes. Give reasons. Write notes on the two lectures. Compare with your partner and against sample notes. Identify the features of the best set of notes.
NOTETAKING 2: FROM TEXTS	Selecting main ideas. Synthesising information from different sources.	Range of materials on fossil fuels	Tutor input Pair work Individual work	Using information from your notes, write 3 paragraphs on "Why it is important to find alternative to energy derived from fossil fuels. Discuss some of the alternatives."
USING THE ENGINEERING LIBRARY	Introducing elementary information-gathering and research methods Using microfiches and catalogues to find information	Handout on the referencing and classification system in the Engineering library	Class discussion and oral exercises based on the handout Group discussion and comparison of answers	Use the microfiche and consult bookshelves to answer 24 questions in worksheets 1 and 2

TOPIC	SKILLS	MATERIALS	METHOD	TASKS
INTRODUCTION TO WRITING SKILLS: TEAM BASED PROBLEM SOLVING TASK (An 8 week project)	Reading a range of materials. Notetaking, information gathering. Defining the scope and tasks for: a) whole team b) individual Conceptualising and planning the project. Dividing up time and responsibilities. Integrating information from different sources. Decision making based on consensus. Writing drafts and editing. Making recommendations. Oral communication. Engineering technical drawing skills.	Handout outlining project Folder of basic readings on Housing, power supply, water supply and transport Handout on oral presentations Checklist on the writing process	Group work (teams of 4) Consultations with tutor by each team rep Individual and team write-ups Submit drafts to tutor and peers Individual writing Oral presentations	Team task: "Developing the infrastructure around a new housing scheme" - submit a group report Individuals in team: "Research and recommend: a) an appropriate type of housing for the scheme b) an appropriate transport system c) an appropriate water supply system d) an appropriate source of power for domestic purposes Each team to present their findings to whole class and a panel of invited guests

Table 1: An Overview of the Wispe Language/Communication Course Illustrating the Interface of Topics, Skills, Materials, Methods and Tasks employed in 1991

Year 2 WISPE Language/Communication course

TOPIC	SKILLS	MATERIALS	METHOD	TASKS
PRACTISING SCIENTIFIC WRITING	Describing a process Writing for 3 different audiences Writing in the passive Comparing and contrasting Building an argument using logical sequencing and other linguistic devices	Handout and worksheet on "Rubber" manufacture 3 articles on "Glass Manufacture" Worksheets of increasing difficulty on the topic of "Minerals" (close exercises, paragraph writing and extended writing) Handout on Hydro-electric and Pump storage systems Handout on "Electrostatics in the Oil Industry" sample answer	Pair work Individual work Pair work Individual work Small group work Individual work Reflection and comparison Small group work Individual work	Complete graded exercises on scientific writing. Apply these principles to a written description of the Glass-making process. Using appropriate register and the passive, write 2 short descriptions on the process of power generation employed by the 2 systems Write a coherent text, explaining hazards due to static electricity and how an oil company can reduce these risks
GRAPHICAL COMMUNI-CATION	Purposes and uses of graphics Visualising and transferring information Integrating graphics into writing Cross-referencing skills Determining appropriate graphic in relstion to purpose	Information handout on types of graphics, including exercises, task-based, written and graphical assignments Handout on "Soda Ash Manufacture": mini project on integration of text and graphics	Tutor input Small group work Individual writing Pair work	Complete graphic and text integration exercises in the handout Develop a flow chart on Soda Ash making process and use it to present a talk to 1st year Science students at the University of Botswana

TOPIC	SKILLS	MATERIALS	METHOD	TASKS
ENGINEERING REPORT WRITING: PARTS OF A REPORT	Understanding basic structure and conventions of report writing Analysing and improving a poor report Writing conclusions and recommendations based on given data Writing a synopsis Writing a complete report	Information handout on the structure of reports An envelope of jumbled up parts of a report on "A faulty boiler" Report on "Gasoline and Turbo Fuel" An incomplete report on "A Rip Snorter Saw"; 1. Article on engineering curriculum minus the synopsis 2. Industrial safety article Data and information sheet on Industrial Safety Sample outline Checklist criteria on "Organisation and presentation of reports"	Tutor input Small group work Pair work Pair work Individual work Pair work Individual work Reflection and comparison	Identify and explain the functions of parts of a report Rearrange the various parts of the report in a clear and logical way; Draw up an outline for an improved version of the report; Write the conclusions and recommendations section of the report, using same register and tenses; Write a synopsis for the report on the explosion at the factory; Write a report for the managing director, based on your findings of the industrial accident which occurred at SAMED;
DEVELOPING ORAL SKILLS AND COMMUNI-CATION	Reading and integrating information from different sources Marshalling facts as supporting evidence Interpreting data	Handout on toxic emissions in Eastern Transvaal from coal-fired power stations. Eskom data sheets on Nuclear Power and Koeberg. Weekly Mail discursive feature on Nuclear Power. Handout on criteria for the assessment of oral presentations. Handout on use of OHP's.	Tutor input Small group work Small group work Individual oral present-ations	Write an article for "Engineering News" on the topic: "The Nuclear Power controversy in South Africa". Present a short talk on the subject to the whole class

TOPIC	SKILLS	MATERIAL	METHOD/	TASKS
INVESTIGATION -BASED REPORT WRITING	Researching a topic Determining cause and effect Using logical connection Writing and editing skills	Article and handout on Kinross mining disaster	Class discussion Small group work Individual report writing Peer editing	Write an investigative report on alternatives to polyurethane as a tunnel lining in mines, with special reference to the Kinross disaster
DATA-BASED REPORT WRITING	Interpreting, analysing and applying data	Handout on generation of electricity including output data from all SA coal-fired power stations Map of South African Power Grid	Tutor input Pair work Individual work	Write a report for PROTEC students on the advantages and disadvantages of building a new coal-fired station in SA. Include a graph on consumption and future requirements of coal and a graphic illustrating the generating capacity of power stations
PROBLEM SOLVING REPORT ON COMMUNITY DEVELOPMENT	Reading, selecting and integrating information from various sources Notetaking Interpreting given data Lateral and logical thinking Problem solving Making recommendations based on research and evidence Coherence and cohesion in writing	Map of town of Ixopo and data on climatic conditions, power costs and other typographical information Descriptions of 3 energy retrieval systems	Tutor input Small group work Individual writing	Analyse information relating to the town of Ixopo and different type of energy retrieval systems and recommend one for use in Ixopo

Table 1: An Overview of the Wispe Language/Communication Course Illustrating the Interface of Topics, Skills, Materials, Methods and Tasks employed in 1991

Year 3 WISPE language/Communication course

TOPIC	SKILLS	MATERIAL	METHOD	TASKS
ASPECTS OF GOLD MINING: A LITERATURE-BASED REPORT PART 1	Reading skills Notetaking Using the library Drawing information from different sources Establishing a conceptual framework for the task and report Integrating graphics Oral communication	A folder consisting of preliminary readings on aspects of gold mining	Tutor input Independent collection of additional information	Write a report outlining the present situation, related problems and possible changes on on of the following topics: 1. Problems of underground mining 2. Health and safety in mines 3. Refining the ore: the recovery process 4. Power supply (electrical, air,water) to the mines 5. Re-processing of waste dumps 6. Housing on the mines 7. Mechanisation of mines Present your findings to the whole group
EVALUATION OF THE GOLD MINING INDUSTRY	Interpreting data Making calculations and recommendation Persuasive writing	Data sheets on South African gold mines: gold yields, production and working costs / profits of the mines regionally; Article from Chamber of Mines and The Star; Sample draft report	Interim small group work Consultations with subject specific staff Individual work	You are a consultant engineer and you have been requested to write a report outlining the criteria you would use to recommend the continued working or closure of the mines listed on the data sheet
PROJECT 1 AN EVALUATION OF WATER RESOURCES IN SOUTH AFRICA PART A	Conceptualising a macro-problem; Interpreting data and diagrams; Making calculations; Reading maps; Problem solving	Handout outlining project specifications; Maps and tables of water; Availability and demand; Description of hydrological cycle; Table of areal and seasonal distributions of rainfall and runoff in South Africa	Tutor input Intensive small group work Individual consultations with tutors	Write a report on aspects of water availability, demand and distribution in South Africa for the general (educated) public. Consider 3 aspects: natural water precipitation, water availability / consumption by area and season and collection and distribution of water
PART TWO APPLICATION OF WATER RESOURCES	Notetaking Making recommendations based on research and evidence Coherence and cohesion in writing	Authentic map of area in which a community in Eastern Cape is located Handout on the writing, drafting and editing process	Individual work Consult when necessary	Write a report recommending the best option for installing a domestic water supply for the Spioenkop community. Consider the location, height of the community dwelling, the distance from the source of water and the storage/distribution of the water from source of dwelling

3.8 A Detailed Look at the Materials Developed Over the Three Years

The materials development aspect of the EAP tutors' work, unquestionably, constituted by far, the heaviest load from the range of their other responsibilities and therefore merits a detailed description.

To illustrate the integrated-skills, integrated-content and graded nature of the course, selective tutorial plans, materials and worksheets are described below. Some typical examples of course content are exemplified to demonstrate the rationale and thinking underlying the materials and therefore the teaching session.

As a general rule, each unit includes a direct skills introduction/development stage as well as an application/ transfer stage. Task-based work is set in the latter stage: it is at this stage that the extent to which the skills learnt are integrated, internalised and applied in a different context is assessed.

Unit on reading from Year 1

Year 1 concentrates on the acquisition and practice of the fundamental academic skills which underpin studying at tertiary level.

Worksheet 1 (Appendix 3) is a "lesson" plan which shows how a session is organised from the tutors' point of view. It tackles the skills required for effective reading. Science/engineering textbooks and discourse are very difficult to access; they are characterised by dense, compacted layout and text. As a result, learners very rarely read or consult them. One of the key reasons why they find this so difficult is because they attempt to read every word in a passive manner which results in frustration and lack of understanding.

The aim of the session is to demonstrate to learners the difference between active and passive reading. An awareness of reading with a purpose is the desired outcome of the session, using an article entitled " The magnetic monopole" and a chapter on "Heat" from their Physics textbook.

The method used in this session makes conscious use of meta-cognitive questions like "How did you approach the reading of the article ' The magnetic monopole '? ". Highlighting effective reading strategies is not adequate so learners are also given the opportunity to practice alternative methods by way of, in this case, directed task-based reading.

Worksheet 2 (Appendix 4)
Apart from pre-viewing, skimming and scanning techniques, an understanding of the information structures found in science textbooks can improve reading strategies. In this session, learners were introduced to the notion of an information structure which underpins a scientific text. The way in which information is organised in scientific texts is different to that of the narrative texts of non-scientific texts. The learners are encouraged to explore and make explicit the information structures in various scientific texts to help access the underlying meanings.

Worksheet 3 (Appendix 5)
Attention is drawn here to the features of scientific writing and scientific text types. Knowledge of the different text types can alert learners to the kind of reading strategies that are required from them.

The identification of the text types and their characteristics is presented and an example of each is included. These examples were , as far as possible, taken from their mainstream textbooks. In the handout they are presented in order of difficulty, so for example, a classification text requires the reader to identify the characterisitics of properties and the system used for their

classification and categorisation.

At the other (more conceptually difficult) end of the text-types continuum, a hypothesis text, required the conceptually-demanding reading skills of identifying a hypothesis and evaluating its validity based on the evidence.
Alongside exposing learners to the range of available scientific text types, they are also introduced to the features of scientific writing such as precision, the use of the passive, use of compound nouns and sequence/logical connectors. This is useful exposure since mainstream lecturers expect learners to emulate this method of writing; the next section of this unit focuses on this.

Unit on a team-based written assignment (Appendix 6)
Team work is expected from learners in mainstream engineering as well as in their eventual real-life work situation.
The "Introduction to report writing" project attempts to pull together all the skills practised earlier in this first year.

Each student is required both as a member of a team and individually to select and research an engineering aspect of Community development. Learners are provided with a file with a description of and data pertaining to a particular rural or peri-urban community. Video material, talks by engineers/"development" personnel and topical readings on housing, transport, water etc. are provided as initial input.

The data on the community of Orange Farm and Cottondale is genuine: each team is expected to solve the basic infrastructural problems that the communities face.

A lengthy process of research and negotiation for each team is required followed by an equally time-consuming drafting, editing and writing process. To "transform writer-based prose into reader-based prose" (Flowers 1981) is the final task for the learners after an intensive process of engagement with the

problem.

This project has now been set for three years and has been extremely successful each time. Since the assessment of their work is done orally and in written form by invited members of the engineering faculty and a video tape made of the presentations, the motivation to do well is very high.

Unit on Graphics (Appendix 7)
The use of graphics as a medium of communication is regarded as the scientist/engineer's shorthand. (Bradley et al, 1985) The purposes to which graphics are put, the features of good graphic devices and using the appropriate form of graphic are the learning objectives in this unit.

Devising and using graphics is the intention in this unit. Learners are expected to choose between bar charts, histograms, graphs, flowcharts, and pie charts and to integrate the graphic within a wider piece of written communication. Typical tasks which include interesting engineering content and require transfer of information in graphical form are:

a) represent information on vehicle usage in SA in a table
b) re-illustrate the line-graph comparing inflation in SA and in other industrial countries in an alternate graphic form
c) write a short paragraph on the pictogram comparing the proportion of engineers and technicians in SA and other countries
d) based on the pie-chart on the working costs of South African gold mines, transfer the information to written form

Following on from this, the worksheet presents data on the utilisation of coal and water in the generation of electricity in South Africa. Learners have to analyse the amount of coal

which was used in the decade of the eighties and give a projected estimate for the nineties which has to presented graphically. In addition, they have to calculate the number of water sources (ie Vaal dam, Spruit dam, Komati scheme etc) which supply the coal-fired stations. The harder task of ranking them in order of size of the water sources in a graphical form is the next task.

A final investigative report is based around the task of citing the advantages and disadvantages of building a new coal-fired power station in South Africa. The two graphics are to be incorporated in this written report.

Unit on a research report (Appendix 8)
..... shows the kind of research-based projects which are set in the third year. In the lead-up to the " Aspects of gold-mining" project, learners are given information regarding the productive output of gold and average yields of the mines.
In their roles as consulting engineers, they have to submit their proposals around possible closures of unproductive mines and the criteria to be used in making this decision. The newspaper cuttings highlighted areas where the consequences of closure would be particularly hard felt; learners have to address all such concerns in their totality.

Following on from this task, each learner can choose one aspect of gold-mining which they would like to research extensively, for example, power supply to the mines, problems of underground mining etc.

For such research-based projects, learners have to do their own primary information gathering: in earlier work, readings were supplied; at this stage they consult staff on specific problems they experience either in conceptualising the research problem or the methodological aspects of the projects.

The increasing level of cognitive difficulty illustrated across the range of the material illustrates the progression

the students have to make from context-embedded tasks to context-reduced tasks.

As can be seen from the above descriptions, our materials writing process involved the formulation and use, in order of importance, of the following criteria:

1 Relevance to mainstream syllabus/ engineering content which was basic to or related "across" all engineering branches

2 Integration of skills and spiral re-inforcement of skills

3 Text-based (ie involves writing)

4 Opportunity for graphical presentation of information

5 Inclusion of some planning / design component

6 Suitability for oral presentation

7 Low or no level of specialist understanding

8 Development of scientific argument: from descriptive to discursive writing.

3.9 <u>Implementation of the Stated Methodology of the Course</u>

Methodologically, there were two distinct phases in the implementation of the course.

Phase 1 : the experience of team teaching

In retrospect, it has been found that all the reasons for team-teaching (pgs 63-64) were justified and borne out by our experience.

In 1986, team-teaching was felt to be the only and most viable way of addressing the multi-faceted needs of the learners and implementing the aims of the course. It enabled the language specialist to gain confidence to the extent that after two years, it was possible for her to further develop and teach the course on her own.

The first two years can be considered as a Phase 1. In this period, both specialists planned, designed materials, taught and evaluated the course. An intense process of skills clarification, gathering and honing of source material, writing of detailed tutorial plans with clear time allocations for each specialist characterised the planning process before every teaching session.

In the teaching session itself, the two specialists had to as Nolasco (1981:126) calls it, "operate in tandem." The subject specialist was very clear that her input was really the vehicle through which learning skills were being acquired and practised; her role being that of introducing the content and monitoring its understanding.

The language specialist had to ensure that learners had a clear idea of the place, purpose and importance of the language/ academic skills to be practised. The content was the main driving force in each session and it varied as to which specialist occupied the driving seat; the one certainty was that the language specialist had to consciously steer the direction of the session, emphasising skills development, albeit, sometimes from the back seat.

This wasn't always easy; the learners, as prospective engineers, tended to find the content always more interesting and it was natural for them to enquire further on content matters.In practice, there was often a tension between content and skills and in this tug and pull situation a fine negotiation of roles took place.

Clarity on the purpose of each teaching situation helped to inform the role that each specialist was to play although in practice the weight and time apportioned to these roles were frequently affected by the dynamics, interests and knowledge of the learner group. With practice, both specialists ensured that the reins were drawn in when academic skills were subjugated in favour of strong flows of content.

A great deal of tolerance and understanding had to be exercised by both specialists; we found Nolasco's observation that " joint ventures seem to depend crucially on the creation of a framework in which the professionalism of both sides can contribute to each other" (op.cit:126) to be highly relevant.

Emphasis in the first two years was very much on ensuring that team teaching took place smoothly. Once the language specialist had gained sufficient confidence and insight to teach on her own, engineering staff were brought in on a more flexible basis.

The effectiveness of a team-teaching approach in developing the course, in our case, was irrefutable. The team teaching was a rich colloboration and served as a springboard for all future developments; it certainly helped to establish the course on a very sound footing.

The advantages of this approach were that the student perception of the relevance of language/academic skills was enhanced and their needs were met in the context of their chosen discipline. The involvement of a subject specialist enabled them to acquire an understanding of the underlying competence required in engineering. Moreover, the language specialist was not plagued by doubts of credibility and was relieved of the worries of subject irrelevance, a near certainty had she chosen to teach the course in a general, de-contextualised fashion, on her own.

As a direct spin-off of this team-teaching experience, the subject specialist was able to devise and establish a Masters in

Science " Language in Science course" within the Faculty of Science, which in turn is "educating" future science researchers and educators in this field.

The success of the team-teaching depended ultimately on the professional attitudes of the people concerned and the compatibility of the personalities. In our case, we respected each others input and were guided entirely by the aims of the course.

The disadvantages of team-teaching are that:

- it is expensive in terms of personnel, time and effort;
- it frequently depends on personality factors;
- it is dependent on the degree of receptivity and willingness of both specialists to work together.

However, in our case, team teaching enabled a meaningful, fruitful interface in curriculum development to take place.

Phase 2: collaboration of a more flexible nature

Phase 2 of the implementation of the course marked the phasing out of the team teaching venture in its original form.
The language specialist had been "initiated" and "educated" in acquiring the groundrules of the discipline and could select engineering material and mould it for the purpose of teaching language/ learning skills.

After two years of team-teaching, a wealth of experience had been gained by her on how to teach successfully in an integrated contextualised way. The language specialist was now able to recreate appropriate engineering contexts for academic/language skills development fairly independently and competently.

A wide range of engineering staff from all branches were still consulted when new material was required, asked to give introductory talks on a chosen theme or to help assess oral presentations/ written reports.

The main difference was that the language specialist was now in sole command and control over choice of material, prioritisation of skills and the timing of the topics to be covered. The legitimate constraints of team-teaching fell away and academic skills development was guaranteed priority.

A new modus operandi had been arrived at: in fact teaching was further strengthened in that the language specialist was now experienced and could find ways to shift the emphasis from **content and skills** to **skills over content.** (ie the perspectives of the language specialist now predominated whereas before there was a close negotiation over a shared perspective).

Energies, in Phase 2, were directed at materials development and streamlining the course. Collaboration with engineering staff continued but occured on a more flexible basis.

3.10 The Experience of Materials Development

Two major observations were recorded in relation to our materials development experience: firstly, that the content should include a combination of the familiar and the unfamiliar for the students; and secondly, that the level and difficulty of the content should be carefully chosen, otherwise there is a danger that the skills to be practised get less time and become secondary to the understanding of content.

Two sets of materials which best met the above two principles are described below to illustrate the principles in practice.

Worksheet 4 (Appendix 9) is designed to give learners the opportunity to improve their writing skills by interpreting information around the theme of electrostatics and its hazards in industry.

The skills of interpreting information from text and diagrams, logical sequencing and the use of logical connectors were selected by the team teachers to be the foci of this session.

At the time of selecting this content, it was known that the learners had covered the theoretical aspects of Electrostatics in their mainstream Physics lectures so it was considered timeous to expand upon this topic. Learners could thus bring their wider theoretical understanding to bear in this practical writing assignment.

A promotional pamphlet published by BP provided the source material which was then re-organised by the team teachers. The re-organisation involved changing some of the language, making the skills explicit for the learners, crafting the content to problematise the issue of electrostatics and designing the lay-out with an introduction, task formulation and student worksheet. By the end of this process, the original material had been extensively re-worked whereby an information sheet had been adapted to a learning-to-write tool.

The cognitive skills of selecting/linking key ideas with supporting examples as well as decoding diagrams had to be employed by the learners in making sense of disparate "bits" of information. Having done so, the writing task required them to present the information in a coherent, scientific style. By using challenging, syllabus-related content, learners had the chance not only to deepen their understanding of engineering subject matter but also to develop key cognitive and communicative skills.

This material was designed for a team-teaching session. The content and presentation of the material as well as the presence of a subject specialist contributed to the high degree of involvement and interest displayed by the learners. As a result they approached the writing with a keeness to demonstrate both their understanding of the topic and mastery of the language/ academic skills.

Worksheet 5 (Appendix 10) sets a problem solving task on the question of which type of energy system would be appropriate for

the hypothetical town of Ixopo. The ideas and source material were brainstormed and the worksheet prepared jointly with two members of the electrical engineering branch. A wide variety of articles and reference books from the engineering library were used.

Learners were given readings on three energy systems: the Oceon Thermal Energy Conversion system, the Solar Pond system and the Helio-Hydro-Gravity system. These readings were fairly lengthy and included information on the kind of criteria and conditions which are required for their implementation. Learners were expected to utilise the reading strategies which had been practised earlier in the course. The data pertaining to the town of Ixopo would have to be taken into account when the learners investigated which system they would recommend.

Learners have to examine the assumptions behind some of the data: for example the stipulated cost of salt is high and since cost effectiveness is a very important criteria for engineers, learners would have to take this financial consideration into account. The data assumes increased significance once probing of its application is undertaken. The design and presentation of this material encourages learners to take a critical, questioning stance and defend their position.

As this was a fairly taxing task, a framework in the form of a table, was provided for learners to make notes which would allow them to compare and contrast and therefore synthesise complex information.

This is a typical engineering task. This kind of problem solving involves choosing a particular solution from a variety of solutions, given the set of local conditions. Learners are requested to justify this choice in writing and demonstrate why the other options were unsuitable. The materials developed for this experience show how powerful the process of materials writing is: the data obviously plays a delimiting role but at the

same time allows learners some option, as long as they can provide a sound argument for their choice.

The materials writers could appreciate Laurillard's (1984) cautionary note when he remarks that " The design of problems is important because the cognitive activity inherent in a particular problem solving task determines the way the student will think about the subject matter." For the materials writers, this task encapsulates the entire philosophy of the course, that of integrating a wide range of academic and language skills, using increasingly complex material. In the hierarchy of problem solving tasks, this task ranks fairly highly.

The specialist staff participated in this exercise with tremendous enthusiasm; they enjoyed working with and shaping content from the perspective of a materials writer, found it instructive, and thought that the task provided good training for students since "Engineering is all about making decisions"

Evaluation of our materials

A continual refinement and honing of materials occured.

Attendance of an overseas materials development course by one of the practitioners highlighted a couple of gaps in our materials. One of the course presenters, Dr. Mike Scott (1992), well-known for developing the Brazilian ESP project, presented a useful way of viewing the relationship between the way materials are organised/used and the teaching process.

He stipulated that course materials tend to involve the "practice" dimension of the teaching process at the expense of other equally important dimensions. He offered three other equally important aspects of the teaching process which materials can support:

Messages	Strategies	Practice	Assessing
learn about	how to	do some	effective?

He explained that, several points are conveyed to learners in the teaching process. Ideally, learners get messages (the "learning about" dimension), are taught strategies ("how to" carry out a certain task), get the opportunity to practice ("do some" activity) and get the chance to assess what and how they have done. Materials tend to assist/support the teaching process but tend to concentrate on the "strategies" and "practice" aspects.

Our materials were analysed to assess if a balance of these four aspects were manifested. It was learnt by us that the strengths of our materials were that they provided students with excellent opportunities for the practice of skills development and at enabling students to develop their own learning strategies but that they were less good at incorporating the underlying messages behind the teaching/learning process and at explicitly incorporating assessment devices which enable students to explicitly articulate what was learnt.

In other words, the links between the message and the practice are not always made clear in the materials given to the students even though these links are made explicit in the actual teaching session itself.

If Bruner's (1967:53) contention that "instruction is a provisional state that has its object to make the learner or problem-solver self-sufficient...Otherwise the result of instruction is to create a form of mastery that is contigent upon the perpetual presence of a teacher.", is to be taken seriously, it is useful to bear in mind the four aspects offered by Scott when writing materials.

By consciously including the "messages" and "assessing " aspects

of teaching, in creative ways, within our materials writing, the materials can be comprehensive and can play a constructive role in assisting students to become autonomous learners. Furthermore, these materials can be used by a wider group of learners as the materials would embody, very explicitly, the multiple aspects of a teaching item.

The materials developed on the course are presently being further developed, incorporating the above-cited four aspects, for publication. Swales' (1980) concern that there are problems with "showers" of single-paged handouts and that one of the "potential values" of published materials is that "they have a clearly discernible shape: a beginning, a middle and an end" has been consciously addressed by us in the latest phase, this year, of adapting our materials for publication purposes.

3.11 Evaluation of the Language/Communication Course

The L/C course was one course within an integrated support programme. The overall aim of the course was to assist under-prepared students to pass their courses and to develop learners who are critical and independent thinkers, effective in processing, organising and communicating facts and ideas.

The effectiveness of the course in achieving this aim has been tackled in three ways;

a) as part of programme evaluation
b) as part of a comparative analysis of retention rates of Wispe students and other black students in the faculty
c) as it is perceived by learners.
d) as it is perceived by the EAP tutors.

An introductory note to the evaluation

When the programme was evaluated at the end of the first year, it became evident that the motivational problems experienced by the first group could partly be attributed to "the position of

Wispe in the faculty and problems relating to recruitment." (Mashishi, 1987)

When he interviewed the students in the first term, Mashishi found that " *students wanted to know how they had been selected - particularly why students who they knew had not performed well.... had not been invited into the programme.*" It emerged that students had been harbouring deep suspicions on selection methods and did not like the idea of black students being identified for support.

Once they were on Wispe, and especially towards the end of the year, a change in attitude was noticeable: " *The programme has helped us. In fact, it rescued us and I feel it is and will in future play an important role in developing most people, who because of poor education background cannot cope with the standard of education at Wits.*" (Mashishi, 1987)

Following the 1987 evaluation report, an information leaflet, publicising Wispe in detail, an orientation process for interested students as well as interviews with prospective students were introduced prior to selection time. Direct contact with programme staff and increased availability of information has made an enormous difference in the attitudes of students. The more established Wispe has become, the greater the interest displayed by prospective students. As more and more students have been through the programme, the image and popularity of Wispe has been enhanced.

This introductory note serves to explain the considerable change in attitude of learners towards the L/C course and the Wispe programme.

a) Comments on the L/C course arising out of programme evaluation

The course has not been evaluated separately but programme

evaluation has been performed three times - in 1987, 1989 and 1991. Each time the course has been evaluated (by different people) as part of the overall programme.

In 1987, the relevant feedback for the L/C course from the evaluator was that engineering content shoud be used at all times, that " an explicit connecti should be made between the knowledge, skills and attitudes taught in the course and the demands of Engineering.", and that cognisance should be taken of the fact that this group of students perceived their major problem to be lack of time and not inadequ te skills. In addition, these students associated the terms "Language" and "Communication" with the Arts and it was recommended that the name of the course be changed to " Introduction to Engineering Communication." (Mashishi, 1987)

In 1989, the evaluator (Gilbert, 1989) commented upon two particular strengths of the course as being its practical orientation which related to " (i) a better understanding of lectures, lecturers, tutors and texts and (ii) more effective vocalising and writing."
In 1991, the evaluator, (Agar, 1991) cited that one of the effective elements of the L/C course was the project work offered.

b) Retention rates of Wispe students

One of the ways to judge the effectiveness of the L/C course, is arguably, to compare the pass/failure rates of Wispe and other learner groups . Agar (1991) found that Wispe students performed better in terms of accumulated credits than any of the comparable groups that he used in his study. He also found that the retention rate for the 1987 intake was higher than any of the comparable groups.
Although, no statistical significance can be drawn from the data (given the small numbers and the fact that both the course and the programme are young) and therefore no judgements can be made

in terms of the long term success of Wispe students, this finding is encouraging.

The fourth intake of Wispe students shows a significant improvement in the first year (from 1987 - 1991) results. Since the type of Wispe student admitted to Wispe has been fairly consistent in terms of their entry level performance, the improvement is encouraging.

It is difficult if not impossible to measure the contribution of the L/C course in the overall improvement of the first year results because of the nature of its content and a recognition of " an almost universal lack of acceptable instruments " (Alderson and Waters, as cited in Hutchinson and Waters, 1987:145)

c) Learner evaluation of the course

" ESP is accountable teaching" (Hutchinson & Waters, 1987:144). Accountability to learners is more sharply experienced by ESP course designers than by mainstream lecturers because these courses are often supplementary in nature and normally have "non-traditional", specified learning objectives as opposed to content-specific objectives.

In our experience, a heightened sense of accountability to learners was created because the first group of learners had mixed feelings about the validity of such a course. Given the wider constraints experienced by the course designer, a challenge on the validity of the course placed additional pressures: not only did the course have to be started from "scratch", but its existence had to be justified to learners.

Therefore since its inception, the emphasis has been on learner assessment of the course. To date, no formal evaluation has been done of the course itself mainly because it was felt that the course needed to go through at least two cycles (ie, years 1,2,3,

to be taught twice).

Attention was focused on gauging learners' response to the content and methodology to illuminate ways in which to improve and refine/professionalise the course.
All three years of the L/C course have been evaluated in a formative, qualitative way. A questionnaire was administered each year to assess the course's usefulness as far as the learners were concerned. (Appendix 11)
The process was a voluntary, anonymous one and the return has never been less than 75% in any one year.

It has been interesting to note that as the course and the programme have, over the years become more established and recognised, that learners' involvement and attitudes have been increasingly positive. The findings of these questionnaires will be presented chronologically as there is a correlation between increased interest in the course and the length of time it has been in existence.

The format of the questionnaires over the years have not altered radically. As the level and interests of each learner group varied to some extent, this feedback was considered essential.

Class of '87

The attitudes of the first group of learners were highly ambivalent. A small vocal group had been negative about the inclusion of such a course and asked if they could be exempted from attending it, to spend time on the other "engineering" subjects. This displayed a clear paradox between their perceived and actual needs: they were struggling to cope under pressure but at this stage did not value instruction on the kind of strategies that might help them.

Many of the questionnaire responses revealed a deep sense of insecurity experienced by this Wispe group who had been selected

insecurity experienced by this Wispe group who had been selected for such support for the first time, in this highly competitive faculty. The evaluation of the programme also accessed this issue of bruised egos arising from the method of selection and as a result, motivational problems persisted for ALL the courses on the programme.

By the end of the course, half the learners (11) stated that the course had been useful, "*especially at the end of the course.*" For these learners the course had helped them develop confidence, taught them to think, problem-solve and the discussions had helped their spoken English.

However, even at the end of the year, 4 learners out of this group were very negative and expressed their dissatisfaction at the idea of teaching about studying and the time spent on this.

As far as the content was concerned, the most representative reservation of the whole group was that the course could have been better structured for engineering purposes but that "*it will improve in the future.*" This was taken to mean that the degree of contextualisation was considered unsatisfactory.

Note-taking, problem-solving and reading skills were particularly appreciated and there was a persistent and urgent note in this early evaluation to include topics like report-writing and project work which were to be addressed in the second year of the course. This has continued to be the case in subsequent evaluations and can be attributed to the learners' perception that these are the overt and principal means by which engineering students are assessed and that too much time is devoted to the underlying skills, ie, the meta-cognitive aspects of learning.
" *Many four year curriculum students fail in their projects because they cannot write good reports which the faculty expects. I'm afraid we might experience the same thing because we did not learn anything concerning report-writing and presentation.*" (in Kotecha and Rutherford, 1989)

They were very positive about working in small groups and felt that it was good preparation for Engineering because it helped develop co-operation, self-confidence and repo.t-back skills since engineers work with many other people in their job; "*Good preparation for Engineers because helps to learn how to communicate.*"

Methodologically, the majority view was that it made a "*nice change*" to be team-taught, found the differing styles interesting; it trained them to "*listen carefully*" and "to learn to accept different tutors". Although the responses were generally positive, a few learners indicated that one style tended to be better than the other depending on the subject matter and that it sometimes affected continuity and development of thought; it was "*difficult to follow a tutor's thought process.*" The topics were sometimes "*badly presented to give value and meaning in the field of engineering.*"

As the two specialists were still learning how to team-teach, learners experience of this process was critical. Pacing of and continuity of instruction in team-teaching surfaced as two key issues: " *Sometimes it was confusing because there was no pause, ie, immediately after one tutor stopped talking, the other one starts. It was as though we were listening to a tape or television.*" Clearly, learners needed more time to synthesise the varied input that was provided and this was addressed by one specialist taking the main or entire resposibility for a section of the tutorial, whilst the other adopted a monitoring function, rather than key concepts being introduced by both specialists.

One very perceptive learner remarked that " *the tutors appeared to be helping one another during the lesson. But gradually it proved to be something worthwhile as it improved the student-tutor relationship.*" Clearly whilst the specialists were adjusting to each other's styles and at the same time trying to ensure that the content perspective and the skills perspective were being appreciated by learners, the learners themselves were

bemused at times!

This first year was an anxious and difficult one.
The novelty of the programme and its L/C course combined with the low self-esteem experienced by the selected learners militated against their adoption of an open-minded, positive attitude. One learner summed up the pervasive attitude aptly when he admitted that " *we led ourselves away with negative expectations of the course and the whole programme.*" (in Kotecha and Rutherford, 1989)

These were students who had been high achievers in their schools, to whom their identity as future engineers was very important, who now found themselves battling to understand lectures and to keep up with the pace of work at university. We have subsequently found that improvement is more noticeable in learners who are more favourably disposed towards the course.

Classes of '88, 89, 90, 91 and 92.

From a teaching point of view, it was interesting whether these subsequent groups found the course useful in general and the which topics/skills were ranked as the most useful. Although, there were always some reservations expressed, on the whole the responses were favourable. There has never been a similar learner group to the '87 one which unequivocally was the least co-operative, most unenthusiastic group. Subsequent groups have been more constructive with their criticisms and displayed a genuine interest in helping to improve the course.

The four areas that learners had the most to say about were popular/useful topics, the relevance/contextualisation issue, small group work and on the question of confidence.

Popular/Useful topics

Report writing, project work and oral presentations were the most

popular every year and learners consistently demanded more time to be devoted to them: *"We must have more lessons in project writing and oral presentations so that when we are doing our final year it can be simple for us to present a project."*

The opportunity to practice their English language skills was particularly appreciated: *"The course is very helpful especially to people who speak English as a second language. More especially because their English is no longer developed whereas they are expected to apply the language."*

Relevance/Contextualisation

The reservations tended to centre around the issue of relevance and the degree of contextualisation learners considered ideal. When asked to submit ideas on the kind of topics/skills they would like to see included, the representative feeling can be summarised as *"I can't pick anything out but my suggestion is that they should not interfere with much of my working. I will like them as long as they teach me something that helps me in my day-to-day life."* This was the over-riding concern: that no matter how useful some academic/language skills could be, they have to dove-tail with mainstream concerns.

This sentiment confirms the hypothesis that the course designer held when conceptualising the course: that the language/academic skills intervention has to be perceived as being immediately relevant. The most useful topics cited above were definitely those which addressed these perceived needs, ie, those which the learners felt were the most applicable to their engineering courses.

On the issue of "contextualisation", again and again, learners pressurised us to select content from their particular branch of engineering. Each year there were learners who pressed for civil, mechanical or mining content: *"The material should be found out from the different branches because our interests are*

different.". Persistent requests like " *don't exclude mechanical engineering topics.*" and " *assignments involving Chemical and Metallurgical processes as most of the ones were more Structural and Electrical.*" were difficult to ignore but since there were six branches in the faculty, this was an impossible demand to meet in every session. In the first three years of the course, content, where possible, was chosen with this criteria in mind but as the course became more skills-driven, no apologies were made on the chosen content but rather an explanation offered of the aims underlying the content.

Small group work

Every year, small group work continued to be popular. Talking, listening, reading and writing in groups not only engaged them but also meant that they had to take responsibility for their thoughts and actions. "*Working in small groups was rewarding and interesting. One had to do everything with the utmost seriousness in order to prove to his fellow group members that he was also good.*"

It became clear that group work has, almost a "culture" of its own, creating far more complex dynamics than the traditional teacher-learner relationship. Learners were clearly using each other as "resources", as a sounding board for their ideas. "*It was interesting because you had to judge your reasoning, how do you react to someone's views and how to be co-operative within a group. This has helped me because it has destroyed all the tension I had when I was with a group in mainstream.*"

Confidence

A recurring and strong theme in the responses when asked how they had benefitted from the course was the gaining of self-confidence. The overwhelming lack of confidence that these learners experienced in their academic work was very striking: although this had been recognised as a problem when the course

was designed, the severity of it was expressed by the learners every year; "*to summarise everything, it is a useful course because it brought me back my confidence through showing me that, I can study engineering but the only problem at the beginning of the year was fear*".

At the same time, feedback from mainstream staff confirmed that they found "*an improvement in Wispe students during the year in that they develop confidence, lose their sense of inferiority and develop better communication skills in terms of ability to interact with me.*" (in Kotecha and Rutherford, 1989)

In a report that a visiting lecturer from the UCT Science Foundation Programme who came to observe the L/C tutorials wrote that "*the first thing that struck me was the high attendance, particularly at such a late stage in year.*" (Garraway, 1989.) To illustrate this quantitively, it was found that a random analysis of attendance figures for the 1991 L/C course revealed a 87% attendance rate.(Garraway's report, in full, can be found in Appendix 12 and offers many interesting observations of the course.)

d) Tutor perceptions of the course

The sources of information in this section were tutor record sheets, tutor interviews and regular meetings of the EAP staff. These were all analysed and the common themes are presented.

Students' learning strategies

Tutors reported that rote-learning strategies were difficult to undo, that students were very caught up in the patterns they had been taught at school, despite the sustained and conscious attempts of the EAP tutors over a period of three years. Detailed marking and feedback had to be given to the students, very often on an individual basis, to develop their meta-cognitive strategies. Appendix 13 lucidly illustrates the scrutiny with

which their written was marked and used as a learning tool.

"Development" and "Standards" issue

Students did improve: their oral and writing skills in the second year of the course were better but the final products, on the whole, were still fairly pedestrian. This consistently led them to question the relationship between developmental progress and the issue of acceptable standards on the course. However, in the absence of valid measurement criteria and instruments, this concern was never resolved and criterion-referenced assessment of individual assignments was practicised.

Tutors, intuitively felt that the course did make a difference but it was difficult to prove this as factors such as the increased exposure to English in a university environment, maturation and influence of the other Wispe and mainstream courses upon the students must contribute to their overall development. In objective terms, it was frustrating not being able to assess how much the course had contributed to their development.

Students' attitudes towards the course

At a psychological level, tutors felt that students were torn between the stigmatisation label attached to such a course and the knowledge that they do not have the required skills for the study of engineering at university level. A basic inability to come to terms with this inner dilemma had an effect on an overall lack of ownership of their problems.
In addition, like all engineering students, they felt under severe pressure from mainstream demands despite an extended curriculum, and did not view their language needs as the most important.

Lack of recognition and involvement from the faculty

Tutors felt that the course was not given enough recognition by the faculty. This, they suggested, could be related to the fact the course was developed as part of a support programme, or that it was a language course and therefore a non-engineering course. An accredited course for second-language students on the basis of proficiency testing might have been held in higher regard by mainstream staff and students.

Another problem that was cited was that in order to develop challenging and relevant materials, the EAP tutors needed a committed and organised back-up team. The tutors had to rely on input on from busy mainstream staff on an informal, "grace and favour" basis.

Tutors felt that a more established and formal access point agreed by the faculty, the chosen mainstream staff and the EAP tutors would have been a better working model. An arrangement whereby such staff could be freed by their heads of departments on a once or twice-weekly basis would have enabled them to draw upon the knowledge, insights and suggestions of mainstream staff. Assistance from the faculty in setting up such a forum rather than leaving it to EAP staff to establish networks would have made a real difference.

Tutor reliance

Tutors expected students to take the initiative but often, regardless of the interactive nature of the tutorials, students were very reliant upon the tutors to instruct or guide them on the execution of the tasks. The most striking and persistent comments recorded by tutors in the tutor record sheets over the years all related to students' lack of independence. A selected few are presented below to convey this theme:

"*Class always responds better to an 'input' session than*

to an 'open' session." (Wispe 1, L/C course: 22/8/89)

"Very receptive to tutor input, what they perceive as teaching." (Wispe 1, L/C course: 29/8/90)

"In this apparently straightforward exercise, I was hoping to develop the following skills:

1. *Problem Solving - students were not guided as to how to answer the question.*
2. *Logical thinking - working out the process*
3. *Language skills - use of the passive and appropriate semantic markers to show sequence*
4. *Describing a process and using original language to do so.*

"As usual, I was struck by the students' apparent inability to interpret and answer the question by themselves. They probably would have had to, left to themselves, or in exam conditions, but they seem to need tutor reassurance and guidance." (Wispe 2, L/C course: 22/3/90)

"My major concern is that the students seem to need a lot of guidance to get started." (Wispe 2, L/C course: 25/7/90)

First/Second-language mix

The tutors felt that the inclusion of the few first-language students on the course had been an unwise decision. The first/second-language mix proved to present a number of problems. The need to develop appropriate proficiency tests was deeply felt.

For students who had severe language problems, tutors had to devise specific exercises for them. Tutors would have liked to incorporate an ongoing research component on the precise nature of the students'linguistic problems by doing systematic error analysis of their written work and although all their written

work was photocopied for this purpose, time did not allow it.

The Wispe L/C course experience in its totality will be summarised under the five categories defined earlier in the literature search.

3.12 Concluding Remarks on the Wispe Language/Communication Course

A) Needs Analysis

Considerable effort was made to elicit students'views on all aspects of the course in a systematic way. There was a constant interpretation and negotiation in practice between the skills and content dictated by the target situation and the demands of the students. The EAP practitioners often felt pulled between the need to represent mainstream concerns and expectations and the need to negotiate these and the course content priorities with the learners.

Ultimately, however, the EAP practitioner had to act as the main decision-maker between these two parties and take responsibility for the choices made. Authority had to be enforced sometimes in subtle ways and at other times quite decisively and target situation factors were used as evidence for the adopted approach.

It is the opinion of this researcher that had the students been offered the course on a voluntary basis, the majority would not have accepted. In other words, they would not have taken the responsibility for attending to their difficulties for two reasons:- firstly, they have genuine problems with time management and base their reasoning on the misguided optimism that any extra time they might have at their disposal is better spent on content, irrespective of poor study habits and secondly, that if they struggled on, somehow their difficulties would lessen with time.

All the tensions have not been alleviated but given the kind of

inherent constraints pertaining to an ESP/CBI context, the practitioners attempted to deliver the best kind of learning package possible under the circumstances.

B) Course Design and Approach

An inordinate amount of time went into finding authentic engineering source material as well as into adapting it for instructional purposes. In many ways, this process can be viewed as a less-specialised recreation of engineering within an adjunct language/academic skills course. A potential alternative to this approach would have been the integration of explicit skills teaching within mainstream curricula to be undertaken by mainstream staff who can consult EAP practitioners but the faculty had already chosen the former route.

Creative and interesting curriculum development took place especially around the integration of a variety of identified skills, sequencing and establishing a hierarchy of these skills and translating all these into presentable materials.

As more experience was gained, the materials became more and more refined. The development of writing skills proved to be the most important skill as they require the synthesis of cognitive, academic and language skills, ie the making of meaning with a purpose and for an audience.

C) Staffing, Expertise and Methodology

On this course, content and language are locked together in a symbiotic relationship, based on the premise that language and academic skills acquisition provides the access to the meaning of content.

Therefore, long-term educational development in addressing language /academic s ls, it would seem, is dependent upon the nature of colloboration between subject and language specialists.

Since collaborative work of this kind is unconvential practice, rewards and incentives need to be considered by policy-making structures at departmental level.

The kind of academic environments and processes which facilitate the active participation of learning, such as small group work, writing as a process etc.., in which students have the chance to synthesise material and relate it to their own needs seem to offer better opportunities for students to access, own and create meaning.

D) Structure

Non-accredited courses are placed at a distinct disadvantage as they carry a service label with them. Students, therefore resist them, do not take them seriously and view them as an optional extra. Had the Wispe L/C course been a fully recognised, accredited course, it would have improved the status of the course for the students and placed the responsibilty of determining a standard for such a course by the faculty of engineering and the EAP practitioners, as external examiners would have been involved.

Non-accredited courses are forced to occupy a disenabling space in academe, especially under circumstances when science/engineering students are under such pressure from the content areas and would probably **prefer** language/academic skills to be addressed by tbe mainstream staff.

By the very unfavourable structural position of such courses good EAP practice can be severely undermined.

E) Evaluation

The case study of the Wispe L/C course demonstrates that developing academic, language and communication proficiency in ESL, underprepared students at tertiary level is an intensely

demanding experience for EAP staff. Undoing rote-learning habits (in students and by staff) and simultaneously equipping students for academic achievement is a slow, developmental educational process which requires official recognition and collaboration from mainstream staff and structures.

Curriculum development initiatives of this type are filling in a crucial gap because our tertiary education system has not adapted successfully to the realities of its majority school system. This work cannot be allowed to remain the sole responsibility of EAP practitioners.

Since it is mainstream curricula that provides the basic framework for the teaching/learning process, greater, formalised articulation needs to be forged between mainstream staff and EAP staff at all levels.

3.13 Conclusion

The comprehensive, integrated view of language/academic skills of course development advocated by Richards and Rodgers (1986) in the literature search was trialled and tested within the Wispe L/C course. This approach was regarded as laudable, challenging and highly desirable by the practitioners but the case study illustrates that the pre-requisite conditions for the long-term consolidation of such an approach were not to be found in engineering. (ie, access to mainstream staff, accreditation and status)

An underlying theme which emerges out of this case study is the issue of where this kind of EAP curriculum development work belongs, and who should teach it. From the comments of the students, the EAP practitioners and some of the problems experienced, the evidence seems to suggest that a paradigm shift is necessary.

Two choices are apparent:

a) either to make EAP courses fully accredited, recognised courses and to provide them with full support from mainstream staff and the administration in the form of formal access to mainstream curricula knowledge and content

b) or to encourage and equip mainstream staff to address language/ academic skills issues in their teaching and curricula. Very valuable and innovative work was accomplished in the L/C course, but this knowledge and experience remained on the outside of mainstream curriculum development: to maximise this and to make it sustainable on a longer-term basis, the EAP practitioners would have appreciated invitations from mainstream staff to work with them on a consultative basis.

The most ideal scenario would have been if faculty leadership had formally attempted to access the L/C approach and initiated policy and practical discussions on how to incorporate it within mainstream courses.

However, it is likely that the former option will continue to be favoured by mainstream staff as well as some EAP practitioners; if this is the case EAP practitioners and courses need to be given a much higher status in tertiary institutions. Such courses do have the advantage of providing the time and focus for students to develop their skills, but these need to be re-inforced and given greater prominence within mainstream curricula and assessment procedures.

A detailed account of one course has been presented. An investigation was undertaken to find out how other courses in the country are placed in relation to the experience of the Wispe L/C course.

CHAPTER 4 A WIDER INVESTIGATION OF EAP/ESP COURSES ON A NATIONAL BASIS

Aims:

a) to investigate the type of EAP/ESP courses which are currently being offered at other tertiary institutions in SA and to document the extent to which they share the predominant concerns raised in the literature search and the case study.

b) to assess any common threads which emerge out of the SA and to identify the main factors which influence their design and implementation.

At the end of the report of this investigation, these concerns are grouped under the five categories identified in the literature search.

There were two distinct stages in the data collection process. Stage 1 involved the formulation and dissemination of a questionnaire and Stage 2 involved interviewing EAP practitioners on a national basis.

4.1 Stage 1: The Design, Dissemination and Distribution of the Questionnaire

Method

A wide survey was initiated to ascertain the range and number of courses being offered in South Africa by starting with the network of practitioners who meet annually at the ASP national conference and consulting the conference proceedings. These practitioners were contacted individually as well as via their department to assist in identifying other EAP practitioners in their respective institutions.

Since this researcher was particularly interested in science-based EAP courses, at institutions where no formal EAP courses were being offered, Heads of Science Faculties at all the universities and staff working in student counselling or ASP-type units were contacted to ensure that no EAP-type initiative had been excluded. All the 21 South African universities comprised the original population.

Once a comprehensive list of courses had been compiled, a questionnaire was devised to access basic characteristics of these courses, the types of students, numbers enrolled, the compulsory/voluntary nature of the enrolment, the length of the courses, staffing, selection procedures and whether the courses were team-taught and student work examined. (Questionnaire given in Appendix 14) This data was classified in a comparative framework for intepretation purposes.

Although, initially only South African universities were the target, this researcher was aware of courses being offered at universities in Botswana, Zimbabwe and Swaziland, as well as university bridging programmes so they were also included in the study.

Course outlines were specifically requested with the completed questionnaires to get a fuller picture of the kind of pedogogical intervention envisaged on the ground.

A content analysis of the course outlines was conducted to determine whether certain topics/skills pre-dominate across the range of courses. This was done by identifying and coding each time an explicit, main topic/skill was listed across the courses.

Associated topics/skills or sub-topics were then grouped under these main topics (Appendix 15): a count of the number of times each associated topic or sub-topic was mentioned across the course outlines was made to assess their dominance. The topics/skills were then ranked in order of their numerical frequency.

Analysis

From the questionnaires sent out, responses were received from 11 SA universities, 2 Southern African universities (Zimbabwe and Botswana) and 2 post-matric bridging programmes, a total of 15 institutions. A total of 23 questionnaires
were returned as some institutions offered more than one or two courses.

A breakdown of the responses

11 responses from 4 historically-white universities in SA
(WITS, UCT, UND, UPMB)
6 responses from 5 historically-black universities in SA
(UNINORTH, UDW, UWC, UNIBO, VISTA)
2 responses from 1 non-residential university in SA
(UNISA)
2 responses from 2 Southern African universities
(ZIMBABWE, BOTSWANA)
2 responses from 2 university bridging institutions
(LEAF COLLEGE, KHANYA COLLEGE)

This was considered a fairly representative sample as it reflects the uneven development of EAP/ESP projects in the country which are concentrated in historically-white institutions. No responses were received from the Afrikaans-medium universities.

Table 2 provides an overview of the findings of the questionnaire.

Table 2: Characteristics of 23 EXP/ESP Courses offered at Southern African Universities and Bridging Colleges

Inst	Course	Audience - Students	Length	Voluntary/ compulsory	Credit bearing	Nos	1st/2nd Language	Proficiency tests	Content	Integrated	Staff nos	Assessment	Team teaching
Vista PE	Science communication	Science BSc and BSc Ed	6 mnths	Comp	Yes	144	Both	Yes	Science	Yes	7 FT	Continuous assessment and terminal exam	No
Vista Soweto	Science communication	All Science	6 mnths	Comp	Yes	All 1st year	Both	Yes	Science	Yes	2 FT	Continuous assessment and terminal exam	No
Univ of Botswana	Pre-entry Science course: Language and study skills	All Science stds on a one year bridging program	6 mnths	Comp	No	360	Both	Yes	Science	Yes	5 FT	Continuous assessment and terminal exam	Sometimes
Univ of the Western Cape	English special	Arts	1 year	Voluntary	Yes	360	Both	No	Language and literature based	No	4 FT 1 PT	70% CA 30% TE	No
Univ of Natal Durban	English language studies	1st yr 2nd language - Arts, Commerce and Law	6 mnths	Voluntary	Yes	180	2nd language only	No	Linguistics based	No	5 FT 4 PT	terminal exam one 3 hour paper	No
Univ of Natal Durban	Language and Communication A "Communication for Academic Purposes"	2nd language Arts, Commerce,Engineering, Science, Social Science, Architecture	6 mnths	Voluntary	Yes	150	Both	No	Humanities based	Yes	3 FT 4 PT	28% CA 72% TE	No
Univ of Natal Durban	Language and Communication B "Communication for Business & Professional Purposes"	Commerce,Engineering, Science, Social Science, Architecture	6 mnths	Voluntary	Yes	150	Both	No	Humanities based	Yes	3 FT 4 PT	28% CA 72% TE	No
Univ of Natal PMB	Language, Learning, Logic	2nd language Arts, Commerce, Science, Social Science	1 year	Voluntary	Yes	No limit: approx 90	2nd language only	No	Humanities based	No	4 FT 3 PT	Continuous assessment and terminal exam	No
Univ of Natal PMB	Language, Learning, Logic - Science Foundn Programme	Science Foundn Programme - Science	1 year	Comp	Yes	32	2nd language on'	Yes	Science	Yes	5 PT	30% CA 70% TE	Yes

Inst	Course	Audience - students	Length	Voluntary/ compulsory	Credit bearing	Nos	1st/2nd language	Proficiency tests	Content	Integrated	Staff nos	Assessment	Team teaching
Univ of Natal DBN	Communication	Economics, Management	1 year	Comp	No	40	2nd language only	Part of programme selection	Economics, Comm Law, Accounting, Bus studies	Yes	1 FT	Formal CA	No
Univ of SA (UNISA)	Practical English	2nd language Humanities	1 year	Voluntary	Yes	4,000	Both	No	Humanities based	Yes	13 FT 15 PT	Continuous assessment and 3 hour TE	No
UNISA	English for Science students	Chemistry	6 mnths	Comp	Yes	400	Both	No	Science	Yes	6 FT	Continuous assessment and 2 hour TE	No
Univ of the North	Language of Science	Science	1 year	Comp	Yes	250	Both	No	Physics, Chemistry, Biology	Yes	2 FT	Continuous assessment and TE	Frequently
Univ of Zimbabwe	Communication skills	Science	6 mnths	Comp	No	1000	Both	No	Science	Yes	10 FT	Continuous assessment	Frequently
Univ of Dbn-Westville	Division of Language Usage	Arts and Science	6 wks	Voluntary	No	280	Both	No	Language based	No	4 FT 1 PT	Continuous assessment	No
Univ of Bophuth: .wana	Special English	All 1st year	1 year	Comp	Yes	500	Both	No	Humanities based	No	10 FT	Continuous assessment and TE	No
Univ of the Witwatersrand	English as a Second Language	2nd language Arts	1 year	Voluntary	Yes	220	2nd language only	Yes	Linguistics based	No	6 FT	50% CA 50% TE	No
Univ of the Witwatersrand	Language and Communication	2nd language Engineering on WISPE programme	3 year course	Voluntary enrolment on WISPE programme - compulsory course	No	60	Mainly 2nd language - Both	No	Science/ Engineering specific	Yes	1 FT 1 PT	CA TE	Yes

Inst	Course	Audience – students	Length	Voluntary/ compulsory	Credit bearing	Nos	1st/2nd language	Proficiency tests	Content	Integrated	Staff nos	Assessment	Team teaching
Univ of Cape Town	English for Academic Purposes in Science	1st year Science	1 year	Comp	No	40	Both	2nd language students achieving <60% enrol	Science	Yes	1 FT 1 PT	Continuous assessment	No
Univ of Cape Town	Communication	Engineering – ASPECTS programme	1 year	Comp	Yes	55	Both	Yes	Engineering, Geology	Yes	1 PT	CA TE	No
Khanya College	Learning skills	All students	1 year	Comp	No	110	Both	Yes	Science	Yes	1 PT	CA	Yes
Leaf College	Communication	Commerce, Engineering	1 year	Comp	No	240	Both	No	Physics, Economics, Engineering	Yes	1 FT 2 PT	CA	No
Univ of Cape Town	Introduction to Medicine & Physics	Medical, Science	6 mnths	Comp	Yes	201	Both	No	Medicine, Science	Yes	1 FT	CA TE	Frequently

SUMMARY TABLE

Inst	Course	Audience-students	Length	Voluntary/ compulsory	Credit bearing	Nos	1st/2nd language	Proficiency tests	Content	Integrated	Staff nos	Assessment	Team teaching
23 courses	14 courses include the term "English" or "Language" in titles of courses	Wide range of students are catered for. 12 of the courses are Science/ Engineering based	6 mnths: 9 courses 1 year: 12 courses 3 years: 1 course 6 weeks: 1 course	compulsory 15 courses voluntary 8 courses	Credit bearing	Nos range from 4,000 to 32	6 courses cater for 2nd language only 17 cater for 1st and 2nd language	7 courses employ proficiency testing	Majority of courses use content to varying degrees except the pure language based courses (3)	17 courses integrate content and skills	28 FT and PT staff to 1 PT	Majority of courses use a combination of continuous assessment and terminal exams Almost all the courses (-1) use CA	6 team teach

Key Findings

The key findings are described below.

Types of courses

The tabulated data reveals that the courses offered are wide-ranging and vary in terms of course design, the numbers of students they cater for, their "home" department and their staffing arrangements. This is not altogether a suprising finding given that historically ESP courses are viewed as service-based and their orientation tends to be shaped and influenced by a particular institution's and students' view of the problem and by their structural location, ie, their departmental home.

General versus specific audiences

When categorised according to the types of learners that the courses service, half the courses (13/23) cater for a specific target audience like economics, science or engineering exclusively (**Table 3**). Only 3 courses have mixed audiences which means that the scope of the content and the skills (and language to a very small extent) is likely to span between the general and the specific. 7 of the courses offer general,decontextualised, academic skills. The spectrum, in other words, ranges from English for Academic Purposes to English for Specific purposes. Courses tend to fall predominantly, within these two broader approaches.

Table 3: SOUTHERN AFRICAN COURSES PLACED ALONG EAP/ESP CONTINUUM

ENGLISH FOR ACADEMIC PURPOSES ⟶ FOR SPECIFIC PURPOSES

GENERAL	GENERAL & SOME SPECIFIC	SPECIFIC
Special English (UNIBO)	Communication for Academic Purposes: A (Univ of Natal Dbn,) (for 2nd Arts, Commerce, Social Science, Engineering and Architecture)	Science Communication Course (VISTA PE)
English as a Second Language (Univ of Wits)	Communication for Business & Professional Purposes: B (Commerce, Social Science, Science, English & Architecture)	Science Communication Course (VISTA Soweto)
Practical English (UNISA)	Learning Skills (Khanya College)	Language/Study Skills: Pre-entry Science Course (Univ of Botswana)
Language, Learning, Logic (Univ of Natal, Dbn, PMB)		Language, Learning, Logic: Science Foundation Programme (Univ of Natal Dbn, PMB)
Division of Language Usage course (UDW)		Communication, ASPECTS (UCT)
English Language Studies (Univ of Natal, Dbn)		Language & Communication (WISPE, Univ of Wits)
English special (UWC)		Language of Science (Univ of the North)
		English for Science students (UNISA)
		(EAP in Science) UCT
		Communication Skills (Univ of Zimbabwe)
		Communication (Leaf college)
		Introduction to Medicine & Physics (UCT)

Location of the courses

When categorised according to their departmental home (**Table 4**), the courses are divided between English departments, faculties of Education, Linguistics departments and specific Faculties (ie Science, Economics and Engineering).

Prior to this categorisation exercise, the assumption was that the general/specific thrust of the course would be determined by its location within a departmental home. However, on investigation this was not neccessarily the case. Table 4 shows that it is not as clear cut as one would presume. For example, the Communication Skills courses at the University of Zimbabwe are highly specialised courses but are housed in the Linguistics department. Similarly, the English for Science students at Unisa caters for the very specific language needs of Chemistry students but is housed in the English department.

Clearly Linguists, English educators and ASP/AD staff are being called upon to provide services for second language speakers and since that is where the expertise is located, their respective departments tend to shoulder the responsibility for academic and language skills development provision.

The type of courses these practitioners devise depends on:

i) the range of students on their courses,
ii) their theoretical understanding of the overall problem,
iii) their own practical experience of the problem,
iv) their own location and links with mainsteam departments.

The extent of the latter determines whether they can call upon subject specialists to assist in the development of their course. No doubt the home department of the course has some bearing on the nature of the course but this does not appear, at this stage of the study, to be a major factor.

Table 4: DEPARTMENTAL HOMES OF EAP/ESP COURSES AT SOUTHERN AFRICAN UNIVERSITIES AND BRIDGING COLLEGES

LINGUISTICS	EDUCATION	ENGLISH	A S P	FACULTY
English language studies (Univ of Natal Dbn)	Language of Science (Univ of the North)	English Special (UWC)	EAP in Science (UCT)	Science Communication course (VISTA)
Language and Communication (A & B) (Univ of Natal)	Special English (UNIBO)	Language, Learning, Logic (Univ of Natal Dbn, PMB)	Science Communication (Vista PE)	Language/ Study Skills: Pre-Entry Science Course (Univ. of Botswana)
Communication Skills (EAP) (Univ of Zimbabwe)		English for Science Studies (UNISA)	Science Communication Vista Soweto)	Language, Learning, Logic: Science Foundation Programme (Univ of Natal Dbn, PMB)
English as a Second Language (Univ of Wits)		Practical English (UNISA)	Learning Skills (Khanya College)	Communication Course, Economics & Management (Univ of Natal Dbn)
		Division of Language Usage Course (UDW)		Introduction to Medicine & Physics (UCT)
				Communication ASPECTS (UCT)
				Language & Communication (WISPE-WITS)

The courses were analysed to assess where they could be placed on the EAP, ie, general, versus ESP/ . ,ie specific, continuum. In **Table 3**, the Faculty-based/requested courses are placed in the right hand side of the continuum whereas the Linguistics ones are on the left, showing the wide spectrum of courses which fall under the Southern African EAP/ESP umbrella. It would appear that the trend is towards ESP or content-based courses.

All the course outlines were studied to see how the academic and language skills were organised in the context of the EAP and ESP continuum already identified. The following 3 course outlines have been selected to illustrate the range along this continuum. **Table 5**. (See next page.)

Most of the courses are fairly new and the practitioners are still evolving and modifying their approach. The majority of the courses do not restrict places to second language learners and out of 23 courses a significant number (12) operate within science and engineering contexts.

Two approaches which do not fall within clearly defined courses which need separate mention are the College of Science at the University of the Witwatersrand (as no course is offered) and Khanya College approaches. These projects incorporate academic/language skills in a staff development approach, ie their policy is that subject specialists address these skills in the mainstream content teaching.

Compulsory/voluntary nature of the courses

The majority of the courses are compulsory as well as credit-bearing and are taught over a one year period. The underlying assumption is that an intensive 1 year course will equip the learners with the appropriate academic and language skills.

Table 5: Three Course Outlines to Illustrate EAP and ESP Content and Skills

SPECIAL ENGLISH : University of Bophuthatswana offered to all 1st year students	COMMUNICATION FOR ACADEMIC PURPOSES (A) offered to second language learners in Arts, Commerce, Social Science, Science Engineering and Architecture students at the University of Natal	COMMUNICATION SKILLS course for 1st year Science students University of Zimbabwe
SECTION A: BASIC SKILLS Understanding the reading process Reading interactively Developing concepts Improving and judging reading speed Strategies for difficult vocabulary and terminology Taking responsibility for monitoring one's own progress SECTION B: READING FOR A PURPOSE Identifying the main points and following writer's argument Notetaking and summary writing Synthesising information Evaluating what one reads Reading critically Interpreting graphic information SECTION C: WRITING FOR ACADEMIC PURPOSES Writing as a process of intellectual development Lecturer expectations of writing Establishing one's purpose by analysing essay questions Gathering and organising ideas and information Drafting and revising Writing up one's argument Expressing ideas accurately Referring to sources Editing one's draft Using an academic style Presenting a final, polished version of an essay	Interpersonal Communication Academic Essay Writing Non-Verbal Communication Varieties of Language Comprehension and Interpretation Reading and Listening Intercultural Communication Small Group Communication COMMUNICATION FOR BUSINESS AND PROFESSIONAL PURPOSES (B) offered to Commerce, Social Science, Science, Engineering and Architecture students Persuasion Report Writing Professional Correspondence Communication in the organisation Graphics Public Speaking	TERM 1 The relevance of communication skills to academic study and to scientific enquiry How to get most from a lecture: information structure; lecturers' techniques; how to listen actively Analysis and discussion in groups of notes taken at a lecture Improving note-making techniques: layout, abbreviations, diagrams, study habits and time budgeting. How to consolidate what has been taught How to handle difficulties and ask the best questions How to get most from a textbook: introduction to reading scientific texts An introduction to the purpose of scientific writing What are the characteristics of scientific writing: conciseness and precision Locating sources: skimming and scanning Techniques for effective revision How to tackle exam questions TERM 2 Words that matter in science: a) coping with technical terms b) semi-technical terms, including abstract nouns, important verbs and problematic adjectives c) logical connectives; problem areas in vocabulary Essay writing: a) analysing a topic and finding information b) organisation of the essay; references and bibliography Description: a) reading descriptions with understanding; the place of description in essays, lab and field reports and exam questions b) important vocabulary in description; how to understand and write descriptions of processes Comparison and contrast: understanding, organising, writing Explanation: a) reading explanations with understanding; expression of result and of cause and effect b) establishing relationships Theory, generalisation and prediction: understanding and expression Reading for meaning: an overview Oral presentations based on material read Revision and exam techniques

Size of learner groups

The most striking difference that emerges from the data is the size of the learner groups: the numbers enrolled vary from 1,000 to 30 students. Unisa, as a distance learning institution caters for the unusually high number of 4,000 for a language course. The size of learner groups is bound to have pedagogical and methodological implications as well as obvious staffing implications for the courses.

Proficiency testing

Language proficiency is not tested in the majority of courses and where such tests are used, they are employed for selection for the main academic support project within which the language course is one of many other courses for example, the Aspects or the Science Foundation programme at UCT. Very few courses (6) are team taught with subject specialists. Most courses test learners by combining continuous assessment with a terminal examination, which is in keeping with the developmental thrust of such courses.

Names of courses

It is interesting to note that on close reading of the names of all the courses in relation to the syllabus objectives, even though most courses address primarily academic AND language skills, many of them give greater prominence to the terms " English" or "Language" within their titles.

This seems to reflect a paradigmatic and ongoing tension: when interviewed most practitioners indicated that the initial impetus for their courses was the perceived acknowledgement that language AND academic skills were the root causes of the problem. However, course content and practice show a greater emphasis on academic skills indicating that the understanding of students'problems is much broader even though the course titles do not reflect this.

On reflection, the name of the Pietermaritzburg course, "Language, Learning and Logic" appears to be the most apt and accurate summation of the particular content of this course. Names like "Special English" and "English for Science students" and "Language of Science" tend to encapsulate and emphasise the language aspect of their courses at the expense of the various other components of their courses. It would appear that more careful thought needs to be put in the consideration of course names to reflect the content balance more accurately .

The course content analysis

Figure 5: Main topics/skills identified in rank order from a content analysis of courses

Academic Writing skills	73
Academic Reading skills	62
Language/Grammar	36
Communication	24
Oral skills	24
Examination techniques and preparation	17
Listening skills	16
Research Assignments	15
Report Writing	14
Notetaking	10
Organisation of study time	8
Graphics	7
Using the Library	3
Problem Solving	3
Project Work	2
Using a dictionary as a resource	2
Site visits	2
Media	2
Memory and recall skills	2
Design Project	1
Assertiveness training	1
Computer literacy	1

The overwhelming emphasis in the majority of the courses was on the development of academic writing, followed closely by academic reading (Fig.10) Although language and grammar skills followed in third place, this distorts the overall findings as 3 out of the 23 courses were exclusively and purely Linguistics-based courses and all the topics listed were wholly language-related which affected the topic counts. Only three courses mention

skills explicitly, and even then they form a minor component of their courses. Thus, numerically, language and grammar skills occupy an unrepresentative third place when analysed across all the courses. Communication and oral skills were represented across the courses and thus can legitimately follow as the next two largest categories.

It has been possible in this section to arrive at an overview and a limited categorisation of the courses presently being offered.

4.2 Stage 2: Interviewing the Practitioners

The purpose of the interviews was to arrive at an in-depth understanding of the experience of implementing each individual course. A comprehensive set of questions were formulated to cover all aspects of the courses:- the objectives, design, selection, student attitudes, implementation problems and insights.

Practitioners were asked about their perceptions of the strengths and weaknesses of their courses and to document the type of problems experienced in the learning and implementation process. Interviews with learners were attempted but proved difficult to schedule.
A deeper level of interrogation of these issues was the aim of Stage 2 of the investigation.

Method

A total of seventeen interviews with practitioners were conducted by telephone. (Appendix 16) A description of the research project was sent (Appendix 17) to them and permission to interview staff using the telephonic method was secured from project heads six weeks prior to the interviews. A list of questions was posted (Appendix 18) three weeks ahead to each institution and a schedule of pre-arranged times for the interviews was drawn up.

Interviews lasting between 30-45 minutes were conducted. A highly sensitive conference microphone was attached to the telephone and to a tape recorder. The recorded interviews were then transcribed: the questions were grouped under the three categories of;

a) student characteristics,
b) course characteristics and
c) course evaluation issues

for the purposes of analysis and summary. Out of these, five were from within the sciences. At times, people were interviewed per course or as a team on a particular programme: for example, at one institution (UCT) the interview was held with all staff members as a team.

Analysis

Since the intention was to draw common threads across these courses, only the responses which could be broadly correlated, ie, issues which could be intepreted across the data are mentioned below. The responses to the fifteen questions are reported below under the five broad groupings identified by the literature search rather than the three, initial categories used for analysis, as the five categories have been used throughout this study and are more refined.

All individual interviews are very interesting, rich in detail and depth, and read as mini "case-studies" in their own right and therefore a sample of 2 interviews are to be found in Appendices 19a and 19b.

1. Needs Analysis and Perceptions

a) The Nature Of The Students' Problems

Interviewees gave lengthy and broad lists of characteristics of students' problems. However, when analysed, it was possible to divide the problems into four

basic categories of background, learning styles, thinking skills and language.

Background

The combination of disadvantaged backgrounds as well as poor schooling was cited as the main factor which contributed to the learners' problems. A narrow or cultural-specific vision thus predominates in students which results in the lack of access to world knowledge. This makes it harder for such learners to access the "*culture capital*" of the institution; the socialisation of knowledge that is usually imparted in the schooling process is absent. This leaves learners in a position of cultural, social and educational inequality which manifests itself in a "*lack of know-how, lack of preparation for university study*" and on a more specific learning level, it manifests itself in a "*lack of background knowledge that is usually brought to a text.*"
(Pandor)

Learning Styles

The use of school strategies at university was cited repeatedly as a major problem. Heavy reliance on teachers and rote learning methodologies have encouraged a dependency syndrome and a lack of rigour. Learners are locked in tracks which make them convention bound. As one very experienced practitioner put it, the learning "*culture of black schools is essentially oral. They hardly read at all. I've been to so many black high schools, and I don't think I ever go into a class in which they do reading and writing, even if there are libraries very little use is made of them, teachers themselves don't read or write much. Essentially, it's listening and speaking a bit....*" (Murray)

Therefore, learners have poor, inefficient reading and writing skills and find it difficult to adopt flexible reading strategies or to write coherently. Understanding and responding appropriately to tasks, organising ideas into sensible,logical arguments and handling ideas at different levels of generality in an academic context pose problems.

Thinking Skills

The inability to engage effectively at a conceptual level is reported in such statements as "***lack of clarity of thought/critical ability, their thinking does not come through.***" (Hill)

Language

Practitioners cite the use of convuluted language, inappropriate mode of expression and discourse and colloquial rather than academic language. The reasons given were the lack of formal instruction in the English language throughout secondary education which results in "fossilised" competence, ie, the use of English does not develop but stays static . Learners exposure to English also tends to lean towards literary or stiffly formal rather than communicative English.

It is believed that the majority of the problems are essentially cognitive in nature. This dimension has surfaced as the dominant one, whilst language is perceived as a secondary one. The combination of lack of background knowledge and poor school teaching gives rise to the catalogue of problems cited above.

One practitioner based her analysis on "***the whole notion of what constitutes the theory of comprehension. Our current use of how people comprehend means that it's your whole***

experience of life that contributes towards whether you're able to comprehend them, be it in your first or second language. If you're second language, you've got the added difficulty of decoding and simply identifying what a word means, the syntax etc..

Nevertheless, a great part of comprehension even in the second language is background knowledge that you bring to the text and that's going to be made up of your knowledge of the content and cultural knowledge.The whole culture of the schools that they've been in does not prepare them for university." (Murray)

No practitioner cited language as the main problem that learners experience.This is best expressed in the following quote: "*it goes beyond language and that it's a whole understanding of what university education is and what is required. The approach is so different moving away from the rote learning model to a model of questioning, debating and understanding. There doesn't have to be an answer, there has to be an argument*" (Thesen). Language problems are clearly evident in learners work; their severity, however tends to be eclipsed when put against the broad range of other problems.

Learner attitudes

The majority (9) reported that students are wary, even negative towards EAP/ESP courses but this changes quite fast and they tend to be positive about the course towards the end of it. Students found that they gained confidence and had developed the required skills

4 practitioners said that the attitude of the students was positive from the start. Interestingly, these comments come essentially from accredited, long established courses. They either have evolved in a subject specific way from a

established general course. When asked to account for the very positive attitude , at one institution, the interviewee said "*it might be that students on the mainstream aren't forced to do 3L and students on the foundation programme are getting the credit for it which they are not getting for other things, maybe it's that aspect which makes the students think it worth working at.*" (Inglis)

4 practitioners describe the attitude as ambivalent. They say that students do find the courses useful but "*still dislike the time spent on them, feeling it could be better spent on direct subject study. While students may see the value of the course and rate it high on teaching and presentation, they resent having to spend time on the course. They feel that there is a stigma attached to being selected to attend the course.*" (Stephenson)

Most people indicated that students who weren't worried about their image and accept and respond to the new challenges within the courses are those who allow their own development to take place and therefore show the most progress. A number of interviewees mentioned that rural students recognised their need for assistance and therefore had a more positive approach.

2 Course Design

a) Aims of the courses

Practitioners stated the following as their expressed aims: they have simply been listed since these verbal formulations provide the reader with an overall impression of the primary aims which drive the courses.

The main aims were:
task analyses,

to tran[illegible] skills,
to develop study and writing skills,
to make explicit academic ground rules,
to develop effective communication skills,
to move from rote learning to critical learning,
to promote efficient,flexible reading strategies,
developing techniques to meet academic tasks,
to use language effectively for the purpose of co[illegible]ing ideas and constructing arguments,
to work co-operatively,to acquire an understanding of the learning environment,
to develop appropriate communication skills,ie, to read and write in English,
to develop proficiency in conceptual demands in different disciplines,
developing responsibility as learners, developing meta-cognition, transferring skills to other academic work,
to read scientific English,
to integrate language in science content lessons,
to develop communication and study skills in Engineering,
developing appropriate language in science,
to teach the characteristics of scientific language,
to develop academic tasks in sciences at tertiary level,
to improve organisation and precision in scientific writing.

b) Proficiency and Selection Procedures

On the question of proficiency testing, the responses were dependent on where the tutors were departmentally located and for whom the course had originally been intended. This appeared to influence the answers in that their own immediate experience informed their views: for example the Linguistics departments felt that any second language learner who wanted to improve their English, at whatever level, should be allowed to do so.

9 practitioners thought that proficiency tests are necessary in selecting students for their courses in order to target learner groups. Supporters of this position felt that given the vast range of ability, grouping all second language learners without assessing the differing levels of competence was problematic. This leads to a situation where the selection window becomes too wide. In addition, some ESL students do not experience problems; including them in such courses only leads to disaffection. Interestingly, with the exception of one course, practitioners from the more established courses used proficiency tests more than the less established ones.

A common criticism of testing is that learners feel inferior and stigmatised. Although there are genuine problems as far as perceptions and self-image are concerned, a pragmatic response was "*If our black students want to improve their skills they've just got to handle that problem themselves , They've got to accept that we are not labelling them as second class citizens, we're saying that you haven't got the same language skills as a student who has been speaking English since he was born.*" (Du Plessis)

8 practitioners were not keen on testing or it wasn't an issue for them because everyone had to join their courses or voluntary enrolment was practised. This type of response came mainly from people involved in self-subscribing, voluntary credit courses. The reasons given for this position were that anyone who feels they need it should be allowed to join and that the skills offered were sufficiently broad to benefit learners at different levels. A few people hadn't thought about the issue carefully because their courses had been open to all ESL students.

c) First/Second Language Mix

The responses were related to the type of courses on offer. A typical example would be the " Skills for Studying Science" which is intended as a general introduction to science study at university. Here it has been found that first language students contribute creatively to discussion. However, only 2 practitioners out of seventeen felt that the mix works.

Most courses had second language learners as their primary audience, and the majority felt that a learner mix does not work and presented difficulties.They reported that first language speakers tend to dominate and monopolise the interaction since they have better language skills. They are easily bored and unmotivated. Although attempts were made to win these students around and persuade them that it was their responsibilty to share their skills and knowledge, students remained unconvinced.

The majority argument against a mix is the tendency to be "*missing your target all the time. You're trying to get to the middle group with the result that first language learners are unmotivated and second language speakers are drowning*" (Du Plessis).

d) Academic / Language Skills Development

All the practitioners categorically stated that their courses addressed both academic and language skills. The general feeling was that it was difficult to separate them. The cognitive and academic needs were the most pressing whereas language skills tend to be taught in an adjunct manner. They are held together in a Vygotskian framework which views language as a medium, with learners making their way through the content via the language.

It is felt that "*once a student can get hold of the notions of structure, argument, coherence, a feel for this, the language problem almost disappears.*" (Thesen) Very little or no time is spent on direct or pure language work and the view that, with intensive output of writing, language development shifts and grows, is a predominant one.

The emphasis is on academic, higher level organisational, information-processing skills; language work accompanies this but not in isolation. Academic tasks are a vehicle for language exploration and development.

When translated into an approach, it "*centres around current use of language teaching that it should be task-based, that the focus should not be on the language but achieving some task or goal so you could be going in there with a totally linguistic approach, your goal could be to improve the students' language, but you still might take that route whilst working on a task*". (Murray) The tasks provide an authentic structure within which to practise the language skills.

Examples were given of earlier unsuccessful experiences of purely language-focused approaches wherein little improvement was noted; little or no transference occured and the problem of fossilised language meant that significant advances were not made by learners. Where specific language conventions are crucial to a discipline, these are incorporated and emphasised within a broader task. In some courses, close marking was viewed as a consistent way of explicitly addressing language errors.

Varied intepretations of the term language were evident in the interviews: reading and writing were used synonomously with it as were conceptual skills. Language in other words has been used very loosely amongst practitioners in this field.

3 Staffing/Expertise/Methodology

a) Relationship with/impact Upon Mainstream Departments.

Most said that mainstream staff had a general, fairly nebulous idea of the kind of skills covered in the EAP courses without knowing the specifics. Since reinforcement of the language and academic skills in mainstream is lacking at present, communication and exchange was viewed as desirable, if not essential. On the whole there are weak links between the "service" course and mainstream although where departments are more open minded towards the EAP type efforts, there is some reformulation of curricula to include an assessment of explicit learning skills.

4 Structure

a) Status of the Courses

Practitioners from only 2 courses, both of long standing, unequivocally, attested that they were granted recognition at their institutions.

8 said that their course status was improving and that greater recognition was being granted specially at departmental level. This was either because departments acknowledged the importance of the course and, in the case of accreditated courses because they contribute to students overall success.

One measure of recognition, it was felt, was the allocation of full-time posts and here progress is slow. Part-time contract posts predominate, although applications for longer term posts are being considered especially for accredited courses. The status issue was also measured by the placement of the course in the timetable and here time slots were often eroded by mainstream subjects. Once

courses enjoy credit status, this often means that reports are submitted to key structures like Boards of Faculty. Also, once improvement in students becomes noticeable, " *People are recognising that the course is effective and valuable , so it has won recognition but it takes a long time*" (EAP staff,UCT)

7 said that little or no recognition was granted. This manifested itself in "add-on" to the main curriculum -type arrangements which leads to de-motivation in learners. Sometimes it was manifested by assuming that mainsteam staff can and should respond to student needs as part of the mainstream. As one practioner put it, the work is "*farmed out, dealt with primarily by temporary and contract staff...There are little things like when the schedule of work is drawn up, the English for Science (ENS) students course gets forgotten, although between Practical English and ENS contribute something like 65% of student numbers and therefore a point for our salaries....*" (Van Zyl)

The key to greater status was fe ' quite simply to be accreditation.

5 Evaluation

a) Severity of Language problems

6 The ast majority, (excluding 2) indicated that they had a very small minority group of learners who had severe language problems. A few tutors saw these students separately since they required remedial work but said that the extent of progress was minimal. For these learners the backlog was too great to bring them up to the required academic competence.

The courses which had no learners with severe problems tended to be those which required sound language skills on entry to the course, ie those with a rigorous selection

process.

b) Error Analysis

8 Virtually no work has been done on error analysis although all types of errors have been noted. For example, omission of articles occurs frequently. However, practioners stated that their main concerns focus on conveying meaning clearly. "*Although there are problems with grammar, vocabulary and syntax, these do not have serious effects on intelligibility. It is the higher level skills which are more serious.*" (Stephenson)

The common feeling is that "*problems are to a large extent developmental, reflecting the increased demands of tertiary study. They include weakness in organisation, coherence and cohesion, imprecision in expression, both in lexical and syntactic choice. Low-level errors of grammar and syntax also occur, but rather little attention is given to them if they do not interfere with communication as they are not likely to impede the student's academic progress.*" (Love)

The difficulties appear more to do with being able to put a complex ideas in clear language, making the transition from conversational to academic English and using precise terms rather than broad sweeping statements.

In summary, errors are interpreted as those which "*range from micro-level of sentences, fragmentary sentences - the most common are at organisational level, they don't get their thoughts organised* " (DuPlessis)

c) Skills students were able to develop

Greater confidence is mentioned by all. It is hard to generalise because progress is dependent on proficiency at entry but it appears that the intervention is successful at

a developmental level. There is progress at surface level processing, or as one person described it as "*the more mechanical skills, they pick up very fast identifying sign posts, transitional cues etc- they are very bad at identifying main ideas and extracting the gist of something, sorting out the relevant from the crucial and that does not improve dramatically, they need intensive practice*" (Van Zyl).

However, learners continue to encounter considerable difficulties when it comes to deep level processing "*and they struggle with identifying the intention of the writer, what is the essential message that the writer wants to convey. It all comes back to this business of argument and inference*" (EAP staff, UCT)

Oral communication develops faster than written competence, although where intensive writing input is provided marked progress is mentioned.

d) Successful Materials

The most successful materials reported were undoubtedly those which included topics which the learners could identify with; "*the more you contextualise in the South African context the more interested they are*" (Murray). Exercises or use of textbooks which are closely related with mainstream syllabi were also popular: "*students respond well to it because they know that what they are doing in the language course is relevant to what they are doing in the mainstream course*" (Ralenala). Authentic, group-based, interactive and thematic materials are reportedly met with enthusiasm.

e) Strengths and weaknesses of the courses

The reported strengths are that established courses are now

in existence and help to sensitise mainstream academics to the learning processes/skills taken for granted in their courses.
Learners, too, accept the courses, gain tremendous confidence and learn to work co-operatively. Some academics are also willing to include EAP practitioners in a curriculum development endeavour to include the type of skills covered in such courses within mainsteam curricula.

Another major strength was that student writing appears to improve: "*We certainly found that in their writing they've learnt what was required in an academic context. When they did their first essay on their own and then re-submitted that there was a definite improvement in their marks. I also looked at the marks of the next essay and the marks of the exam essay and a large number had maintained an understanding of what was required.*" (EAP staff, UCT)

The major weaknessess are the uncertainty of transferability, the lack of statistical evidence that these courses make a difference,the lack of research on the specific nature of language problem for E2L learners and the lack of an academic base.

f) Achievement of aims

Most courses include formative evaluation using open-ended questionnaires. Detailed ongoing feedback is elicited from learners who make statements like "*it's been tremendously useful*" (Inglis), and" *They've said positive things so we can assume that we are achieving our aims*" (Du Plessis). A characteristic response from learners is to inform the practitioners that "*they couldn't have achieved so well without their bridging*" (Flockeman). Therefore, most practitioners stated that they were reasonably content that their courses were achieving their aims.

Various longitudinal studies are being initiated to assess the effectiveness of these courses and the trends point to improved performance: "*We compared our students on their credit course with the whole class and with other black students from DET schools and they have done amazingly better, their pass rates are sometimes 80% when other DET students have 30% and sometimes its 70% and 50% but its always much better. It's a very significant difference and of course you can't really say what it is that made the difference, because they're on a reduced load, and we also like to think what we teach them helps, but I'm sure part of it is just being in a small group, in study groups, building confidence etc*" (Flockeman).

Within science related courses, practitioners note that learners have become better readers and "*become aware that English is something that can be useful to them as scientists, whereas before they thought it was for arty, humanitarian people*" (Van Zyl).

g) Main Problems encountered

Two types of responses emerged: in the case of non-accredited courses - erratic attendance and timetabling problems: "*where there is any empty space in the afternoons they will reserve that for the language course.*"(Ralenala) Learners tend to treat assignments less seriously than those set for credit courses - "*producing minimal work or copying from others.*" When mainstream demands are heavy, attendance is seriously affected" (Stephenson).

The lack of articulation in standards on the EAP courses and mainstream is explained as a real problem: - "*the mismatch between the standards set in our courses and those set by mainstream subject lecturers who exercise a great deal of tolerance. Thus Communication Skills Course's teaching is not generally reinforced* " (Stephenson).

The lack of communication with and reinforcement by mainstream academics surfaced repeatedly "*we are very different from the rest of the university, we act very much on our own and don't have the time or space to work in great detail with mainsteam departments. The impact of our work is limited by that lack of access and any good that we do is negatively affected by the fact that academics are not interacting with our teaching*" (Pandor).

This leads to marginalisation of the intervention and more importantly, a discrepancy between the expectations of mainstream curricula which is very content-bound and those of the academic/language skills courses which concentrates on key learning processes.

4.3 **mary of the Wider Investigation**

South African learners, in addition to having to operate in a second language are underprepared in a number of ways. Therefore, the primary focus for practitioners tends to be on academic/cognitive skills. Language input is either a minor or integrated component within the courses. The generally preferred approaches are to address language skills as they arise in the learning situation or to have an adjunct focus on language rather than focus exclusively or mainly on language activities.

From the stated aims of the courses it is possible to surmise that there is a place for general academic skills although the trend is towards content-based EAP/ESP instruction. By general is meant the skills which all groups of learners require, those of reading, writing, speaking and listening. It is the form that these take, the vehicles which are used to teach these skills that are in question.

The pressing issues are concerned with developing better researched and refined instruments for selecting students, fairer timetabling of the courses, raising the status of the courses by

accrediting them as well as the crucial issue of raising mainstream staff awareness of their content and approach.

There is a very real need for mutual interaction between the departments/units who offer the courses and the mainstream departments they 'serve". Many practitioners felt that formal structures which enable ongoing communication on all aspects of their courses (teaching, administration, student performance) are necessary to provide a better service as well as to signal the importance of these courses to students.

Course practitioners should not be placed in a situation wherein they have to justify the raison d'etre of their courses; the overall message that learners should be receiving from mainstream and the course practioners is that mastery of the stipulated skills is important.

Altogether more dynamic and reciprocal arrangemements to take ownership of the problems are felt to be necessary. The all too frequent attitude of mainstream staff to the problems, ie, "*Many people are just too relieved not to have to deal with it and leave it to the people who are perceived as glorified school teachers*" (Van Zyl) is clearly a major obstacle on many of the fronts described above. If the desirable and very necessary transfer of the skills taught in these courses is to occur, the co-operation of mainstream staff is vital.

Practitioners envisage a growing demand for more of such courses; that such courses will be called upon to serve larger numbers of students in the future. Ad-hoc responses to the issues of selection, status, course content and delivery tend to dominate the EAP field. Joint responsibility for addressing this problem by departmental staff and EAP staff is an important concern. Creating a professional image of these courses is at the heart many of the problems mentioned already.

It would appear that most courses fall into the "student

development model". This model, as the term implies, has as a disadvantage, its underpinning notion that students lack certain skills and need to acquire these by way of compensatory education. The advantage of a student development-based courses is that they can be of an empowering nature, in that, they provide students the time, opportunity to focus on their difficulties, ie, they offer a pathway to academic achievement.

However, in the broader ASP/AD community, practitioners are strongly arguing that it is becoming necessary to address the development of these skills by training their mainstream staff so that they can incorporate them in their day to day teaching (Mehl 1992, Walker 1992). This model has come to be known as the staff development and /or curriculum development model and clearly is a long-term process requiring change at the institutional, policy, curriculum, training and assessment levels.

A combined approach incorporating realistic time options for student development and staff development within flexible curricula structures is desirable, in the interim, until substantial mainstream curriculum development work becomes established in institutions. This is a sensitive, even political, issue for universities as it tends to be (and not always appropriately) associated with the issue of "standards" and the image of universities.

Increasingly, the combination of student development, staff development and curriculum development is being advocated. In practice, all three need to to be placed on a continuum of educational development work at our universities. A more organic relationship between mainstream curricula, staff and learner competencies needs to be effected.

It has been possible to describe key characteristics of the kind of courses in existence and the type of concerns facing course practitioners: these insights are incorporated in the

next section which draws upon all the evidence from the literature search, the case study and the wider investigation to identify key factors for the successful development of content-based courses.

CHAPTER 5: CONCLUDING CHAPTER ON THE FACTORS INFLUENCING THE DESIGN AND IMPLEMENTATION OF CONTENT-BASED COURSES IN THE SOUTH AFRICAN CONTEXT

The intention behind identifying factors which influence content-based courses for ESL underprepared students in the South African tertiary context is to inform other EAP practitioners of the kind of content-based course developed at one particular institution and the extent of corroboration of this experience by other practitioners nationally.

The majority of the identified factors have arisen from one adjunct content-based course although most of them are reinforced by the findings in the literature and in the wider investigation.

It would appear that the following factors need to be considered in the conceptualisation, design and implementation of adjunct content-based courses. The factors are presented in the order of the five categories used throughout the study.

1 Using target situation analysis as a principal data source for a wider needs analysis and for course design. (A needs analysis factor)

2 Incorporating learners' interests, needs and levels of competencies. (A needs analysis factor)

3 Integrating the content of the discipline with the academic/language skills which underpin that discipline. (A course design factor)

4 Designing and formulating authentic materials and tasks which allow the progression and accomplishment of context-embedded to context-reduced tasks and incorporating a "learning to learn" component. (A course design factor)

5 Developing entry-level proficiency tests, criterion-referenced assessment and identifying exit-level competencies. (A course design factor)

6 Establishing formal access to mainstream staff and the knowledge base of the discipline. (A structural factor)

7 Accrediting the courses so that they become part of the degree structure and gain the same status in the curriculum and the timetable as other courses. (A structural factor)

8 (a) Developing a team-teaching methodology or flexible collaborative arrangements so that a degree of co-ordination between the EAP practitioner and content staff is established.

(b) Improving the status of EAP staff by including EAP practitioners in key curriculum development and policy-making structures (Staffing/methodological factors)

9 Developing small group work contexts: where large numbers of students are involved, to find creative ways to provide opportunities for interactive learning so that deep level processing can be practised. (A staffing/methodological factor)

10 i) Using triangulated, qualitative evaluation techniques systematically to
   a) gauge learners' perceptions and experience of the course,
   b) gauge EAP tutor's experience of teaching the course and
   c) gauge mainstream staffs' experience and observations of student development.

ii) Using quantitative techniques to conduct a comparative valuation of students on the adjunct content-based courses and those students outside these courses. (Evaluation and research factors)

Although the above factors have emerged out of one content-based course, they are applicable to the other content-based approaches, particularly, those located within mainstream curriculum development work. Whether it is a six weeks orientation course within a department or a fully integrationist type endeavour, the principles can be applied flexibly and creatively.

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HOW ARE THE STUDENTS SELECTED?

This is based on the April Maths and Physics test results which are subjected to a discriminant analysis to identify "at risk" students who have a reasonable chance of passing. The following tables indicate the window of selection as well as end of year pass rates.

Combined 1985 and 1986 passes and fails related to "discriminant analysis" sources

%	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	
Fail	3	16	50	73	84	26	9	1	1	263
Pass	0	0	2	42	83	126	150	74	21	498
Total	3	16	52	115	167	152	159	75	22	761

Relationship between "discriminant analysis" scores and end of year pass rate in 1988 for all students

Rating	<40	40-44	45-49	50-54	55-59	>60
Pass Rate	7% of 57	37% of 30	51% of 43	74% of 42	74% of 49	83% of 211

Relationship between "discriminant analysis" scores and pass rate of first year WISPE students in 1988

Rating	<40	40-54	≧55
Pass Rate	17% of 6	67% of 12	100% of 4

From the evidence, it appears that the WISPE selection technique identifies a group of students who stand a fair chance of passing. These students are offered a place on the programme. Whilst enrolment for WISPE is voluntary, once a place is taken up, attendance of all the courses and tutorials is compulsory. A comprehensive learning and support programme has been drawn up and thus the rationale has been to engage the student in this process fully, thereby requiring their full participation and attendance.

Appendix 2

TUTOR SHEET : WISPE

X 1	2	3

Course	Date	Tutor
H/C 1	13/9/90 14/9	A DUPLESSIS

"Community Project"

Topic/Aim of the Session

① Explanation of topic/project
② Group formation

② Needs of a typical underdeveloped community

Method used

Please provide a copy of any handout (notes, test, etc) given to students

① See file

② Taped interview with a resident of Orange Farm

Comments

① Groups were formed under the direction of Sujit & the group topics were then chosen

② The taped interviews went down very well. Most people took (copious) notes. Some class members are trying to organize a site visit to Orange Farm

WISPE I STUDENTS : 1990

Session 2 **READING IS AN ACTIVE PROCESS** 17th May 1989

OBJECTIVES:
* to gauge students'perceptions of the reading process
* to discuss reading as an active process
* to initiate the notion that reading with understanding requires a strategy and specific methods to access information

METHOD:

1 Give students a fairly difficult passage " **The Magnetic Monopole**" to read individually. They will tend to read it slowly and in a disorganised way and most probably will not question the purpose. This task is to highlight their approach to reading. It will enable them to respond more concretely to step 2.

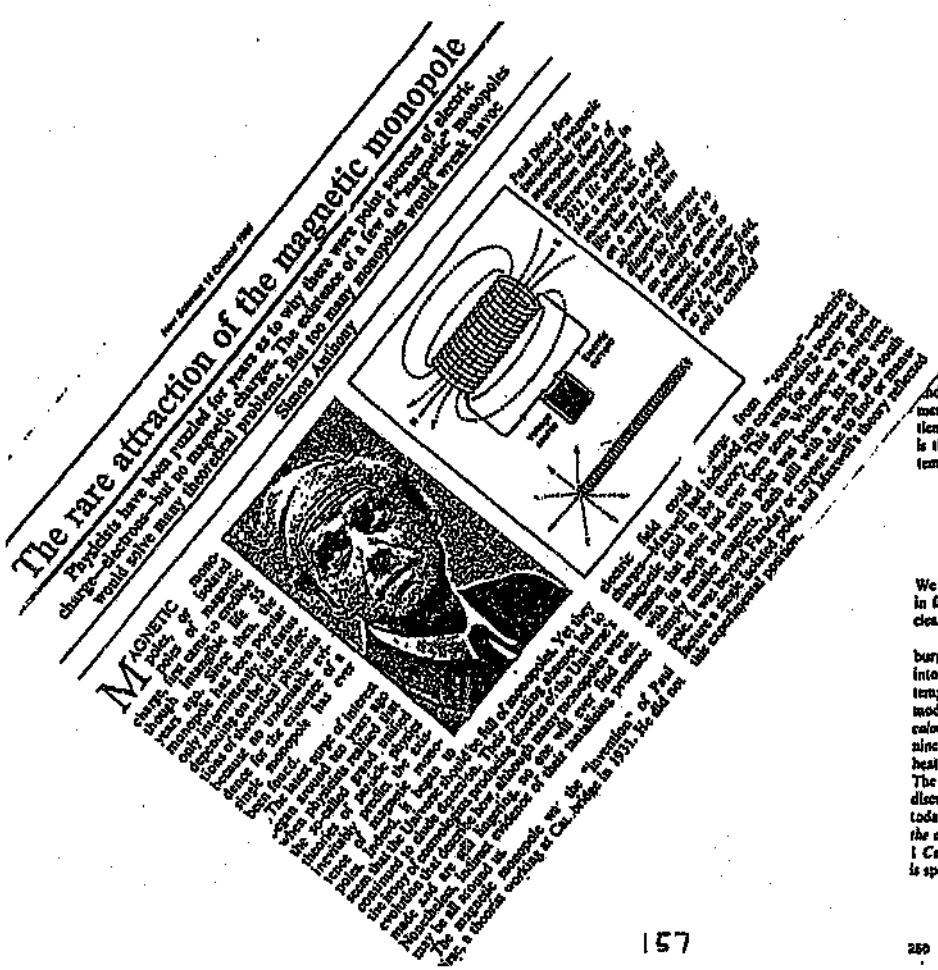
2 Ask students, in pairs, to reflect and discuss their reading approach. What happens when they read?

3 Write the comments of their experience on the board. Most of their comments will probably emphasise passive aspects of reading.

4 Discuss the reading process with them. Develop a mind map on the board.

5 Differentiate between a passive and an active approach to reading. Talk through the characteristics of an active reader on the transparency.

TASK: Give students the extract from the chapter on "Heat" and to answer the question, in writing, on " Why does water in a canteen stay cooler if the cloth jacket surrour ing the canteen is kept moist?
Purpose: to read actively with purpose in mind.



The rare attraction of the magnetic monopole

Physicists have been puzzled for years as to why there were point sources of electric charge—electrons—but no magnetic charges. The existence of a few of "magnetic" monopoles would solve many theoretical problems. But too many monopoles would wreak havoc

Sharon Anthony

MAGNETIC poles, or magnetic charge, first came to explain through magnetic life as monopole. Since then, the only intermittently, its status decreasing on the basis of theoretical progress because no undeniable evidence for the existence of a single monopole has ever been found.

The latest wave of interest began around 10 years ago when physicists realized that the so-called grand unified theories of particle physics inevitably suggested monopoles existed. Indeed, it seems that the Universe should be full of monopoles. Yet they are not. Studies of cosmology cast doubt on the standard version of the big bang theory of the Universe's evolution that describes how, although many monopoles were made and are still known, so one will ever find one. Nonetheless, indirect evidence of their tantalizing presence may be at hand as

The enigmatic monopole was the "invention" of Paul Dirac, a theoretical physicist at Cambridge University in England, who published a seminal paper in 1931. He did not

Paul Dirac first introduced magnetic monopoles into a quantum theory of electromagnetism in 1931. He showed that a magnetic monopole has a field like that of a very long solenoid. The magnetic filament has the field due to an ordinary coil of wire, except that the monopole's magnetic field is confined to the ends of the solenoid, as the field of an electric charge is confined to the ends of a charged rod. (Illustration by Sharon Anthony)

electric charge—field could escape from "source"—electric. Maxwell had included no corresponding sources of magnetic field in his theory. This was for the very good reason that none had ever been seen. Whenever a magnet with its north and south poles was broken, its parts were simply smaller magnets, each still with a north and south pole. It was believed Faraday's copper disc could find or measure a single isolated pole, and Maxwell's theory reflected this experimental position.

HEAT

...pold water is placed on a hot burner of a stove, the tempera... ...ter increases. We say that heat flows from the hot burner to ...er. When two objects at different temperatures are put in con... ...spontaneously flows from the hotter one to the colder one. The ...eous flow of heat is in the direction tending to equalize the tempera... ...if the two objects are kept in contact long enough for their tempera... ...s to become equal, the two bodies are said to be in thermal equilibrium, ...nd there is no further heat flow between them. For example, when the ...mercury in a fever thermometer is still rising, heat is flor 'ng from the pa... ...tient's mouth to the thermometer; when the mercury stops, the thermometer ...is then in equilibrium with the person's mouth, and they are at the same ...temperature.

11-1 | Heat as energy transfer

We use the term "heat" in everyday life as if we knew what we meant. But, in fact, the term is often used inconsistently; so it is important for us to clearly define heat and clarify the phenomena and concepts related to heat.

It is common to speak of the flow of heat—heat flows from a stove burner to a pot of coffee, from the sun to the earth, from a person's mouth into a fever thermometer. It flows spontaneously from an object at higher temperature to one at lower temperature. Indeed, an eighteenth-century model of heat pictured heat flow as movement of a fluid substance called *caloric*. However, the caloric fluid was never able to be detected, and in the nineteenth century, it was found that the various phenomena associated with heat could be described consistently without the need to use the fluid model. The new model viewed heat as being akin to work and energy as we will discuss in a moment. First we note that a common unit for heat, still in use today, is named after caloric. It is called the *calorie* (cal) and is defined as *the amount of heat necessary to raise the temperature of 1 gram of water by 1 Celsius degree*, from 14.5°C to 15.5°C. This particular temperature range is specified since the heat required is very slightly different at different tem-

STRUCTURES OF INFORMATION IN SCIENTIFIC TEXTS

OBJECTIVE: to introduce the concept of structures of information

METHOD: to teach this by using the article "The nature of reading in science: the text and the task" which focusses on the information structure of texts.

1 Ask students to preview the article to access the text for the general structure and direction of the author's aims.

2 Ask students to read the whole article with this question in mind: "How are the texts of science to be described; in what ways do they differ from texts in other areas; and how does the text layout and content influence the reading?"

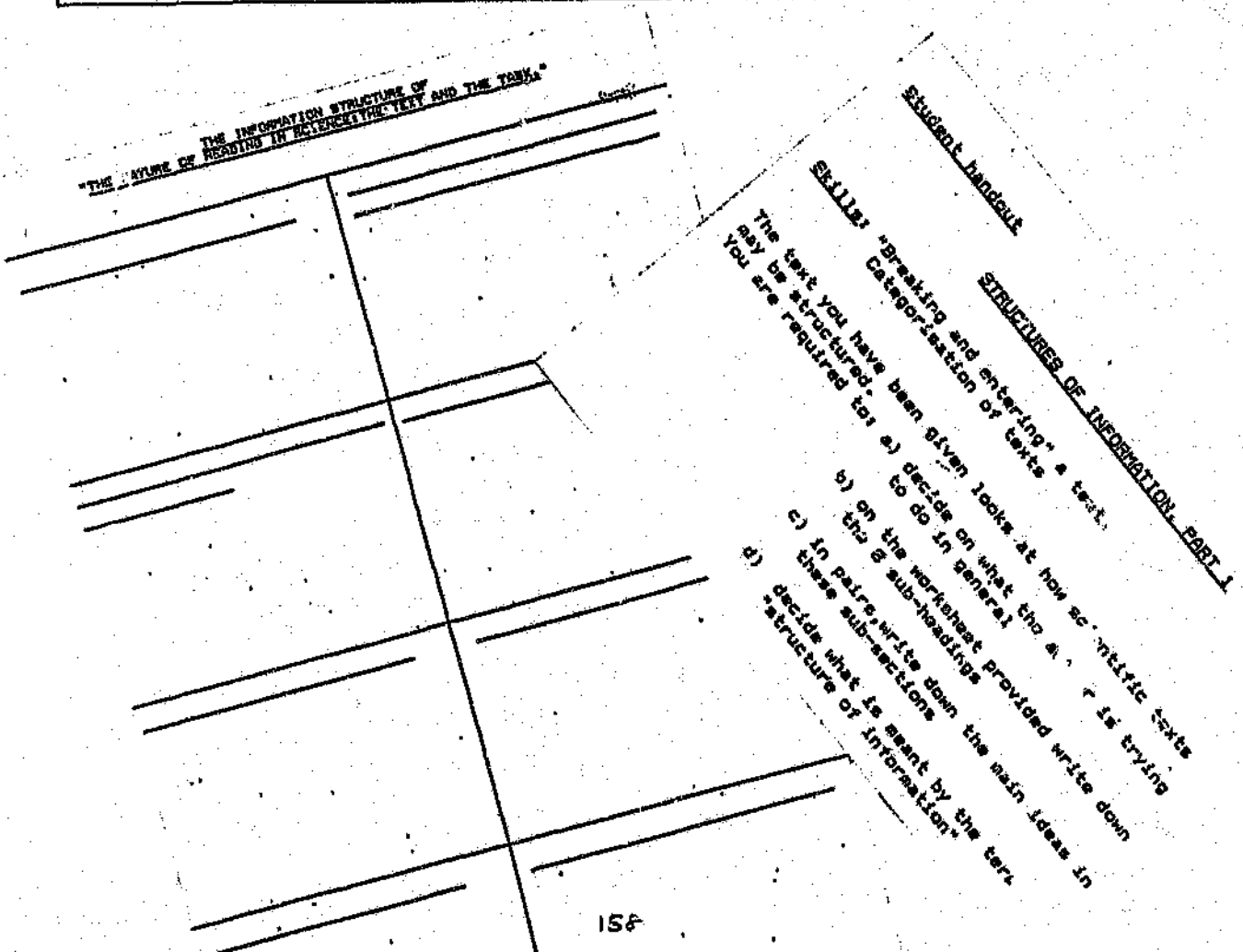
3 Students to skim and write down the 8 sub-headings on the worksheet provided. (This is the information structure of this article.)

4 Ask students, in pairs, to write down the main idea contained in each of the eight parts.

5 Discuss the main ideas with them orally. In doing so, they will be internalising aspects of structures of information. (Note that the main ideas of the article have been succintly summarised in six points at the end. Alert them to this.)

6 Mention that previewing and accessing the structure of information in a text follows one another and/or occurs simultaneously.

TASK: Using previewing techniques, determine the information structure of the article " Four Fundamental Forces".



SCIENTIFIC TEXTS

Researchers have classified scientific texts into three main categories, according to the purpose for which they have been written.

These categories are:

Activities: experiments, observations, instructions
Phenomena: descriptions of structures, mechanisms, processes
Ideas: concepts, principles, ideas

Within these three categories, seven types of text have been identified: instruction, classification, structure, mechanism, process, concept-principle and hypothesis-theory.

1. INSTRUCTION TEXTS

These texts give instructions on, for example, how to do an experiment, make something or use a piece of equipment.

Each instructio. text will contain some or all of the f
elements:

actions or procedures
materials
apparatus
conditions, cautions
results or outcomes
interpretation of results

* The active reader should s'
consider the purpose of

5. PROCESS TEXTS

Process texts describe or explain transformation and sequent changes. They include information about

the state or form of the phenomena at different stages;
the properties/structure of the phenomena;
the stage or steps or time of change;
the action which causes transformation;
the location of the change;
the instrument or agent of change.

Process texts vary considerably and they are potentially very complex.

* To read a process text actively, the reader should

locate the different stages and states of the phenomenon;
assign to these an instrument or agent of change;
identify the transformations which occur.

Example 5: A process text

Although rocks may not be soluble in water, nevertheless the wind, rain, and frost may break them up into smaller pieces. These are washed down by rivers and eventually reach the sea – maybe after many thousands of years – as mud, silt, and sand, which accumulate at the bottom of the sea, or in lakes. As the deposit gets thicker, the bottom part is squeezed more and more, and becomes a compact mass. Often the particles are actually cemented together through substances produced by chemical reactions. The shells of dead sea-organisms, which are made of calcium carbonate (or chalk), may form a layer on top of the mass, or at intervals between layers. Then the sea may have receded, or earth movements may have taken place, making the sea bed dry land. What was the sea-floor may now be hills or even mountain ranges. Rocks of this kind are called sedimentary rocks, and include limestone, chalk, sandstone and shales.

From A. J. Mee, P. Boyd and D. Ritchie, *Science for the Seventies*.

6. CONCEPT-PRINCIPLE TEXTS

Concept-principle texts are about phenomena in the real world, but they are more concerned with ways of thinking about phenomena than with describing them. The ways of thinking may be thought of in terms of concepts or principles.

In the text that is introducing a concept, there is usually a focus on definitions and on the definiting features of the concept. When the text is concerned with introducing a principle, the focus will be on examples or applications of the principle.

Concept-principle texts usually contain this information:

definition or principle or law;
restrictions or conditions;
defining features or evidence;
instances or examples or applications, with analogies;
measure of test.

* What the reader is required to do when dealing with a concept-principle text is to re-examine certain known physical phenomena and reflect upon how they behave. A new framework for that reflection – the concept or principle – is provided. Each part of the text links naturally with what preceded it and with what follows.

2. CLASSIFICATION TEXTS

These texts describe what phenomena are like, what their characteristics are and how we might classify them.

Some elements of a classification text are:

examples
features or properties
comparison/contrast
tests of properties
systems for classifying

* When reading a classification text we should try to identify examples or groups, and their characteristics (or properties or features); work out the system for classification; and categorize examples according to the system of classification.

Example 2: A classification text

Solids, liquids and gases

The most obvious features of the way that the particles are arr
a substance depend on whether it is a solid, a liquid, or a
The particles in a solid must be held in fixed positio
solids would not retain their shapes. Moreover, the p
must be packed very tightly together. This is evider
solids are very difficult to compress. Even at a v
change in volume is very small indeed.
In most liquids, the particles are less ti
This is evident when a solid is melted as
volume on the change from solid to li
also difficult to compress, the r
together. The main difference b
shape. They take th

4. MECHANISM TEXTS

A mechanism text contains the same elements as a structure te
also includes information about the phenomenon or principle
involved, that is, the why and how the structure works in as
important as its parts.

* Mechanism texts are difficult to read; the reader must relate the
text to the diagram and in addition, relate the action of the parts
to the phenomenon acted on.

Example 4: A mechanism text

The aneroid barometer

Although the mercury barometer can be a comparatively accurate
measuring instrument, it is rather bulky and 'spillable'.
Another instrument for measuring atmo
Aneroid Barometer ('aneroid' means 'wi
barometer, air pressure is balanced
The vacuum box is made fr
opposite sides are kept apa
ure tries to squash the b
of the spring are
pressure will
decrease

ric pressure is the
(d'). In the aneroid
ful spring.
netal. The two
hile air press-
the bottom
ease in air
rds; any
the top

HOW INFORMATION IS STRUCTURED IN A SCIENCE TEXT

	TEXT TYPE	INFORMATION IT CONTAINS
Activities	Instruction	
Phenomena	Classification	
	Structure	
	Mechanism	
	Process	
Ideas	Concept-principle	
	Hypothesis-theory	

WISPE 1 : LANGUAGE /COMMUNICATION

COMMUNITY DEVELOPMENT PROJECT : SKILLS AND ASSESSMENT

Your work during this block will take the form of an extended project for which you will be required to select a topic, to research it, and to produce a report on your topic. You will also have to present your research findings verbally, in front of an audience.

Skills

The skills required for the project will incorporate much of the work covered so far in the Language/Communication course, viz

- active reading
- note taking
- writing a passage based on your notes
- public speaking

Assessment

You will be working as a member of a team and individually, to upgrade and develop a specific community. Each team will be assigned as a community and the team leader will report on the project as a whole. Each team member will research one aspect of the community. (See handout 1 for details.)

Specialist input

To assist you in this project you will be given readings on the relevant subject, and talks by engineers and other specialists. You will be required to carry out your own research as well.

We hope that you will enjoy the project and go on to WISPE 2 with added confidence.

WISPE 1: LANGUAGE/COMMUNICATION

COMMUNITY DEVELOPMENT PROJECT

South Africa may be characterized by "the existence of a (highly) developed, energy intensive industrial capitalist economy ... alongside an underdeveloped sector where the majority of the population live in relative poverty" - Anton Eberhard. The people living in these rural or peri-urban communities have to grapple with problems related to, amongst others, water collection and storage, lack of suitable housing and diminishing fuelwood sources.

In this assignment you will use your Engineering skills to upgrade one specific community by suggesting appropriate, low cost solutions to some of the community's problems.

Your task

1. Work in a team of 4 students. Select a team leader.
2. Study the data about your assigned community.
3. Each team member should research one of the following:
   - "If South Africa is to provide all her people with housing by the year 2010, a massive 127 000 units will have to be built each year" - Engineering News. Design an appropriate, low-cost housing unit for the community.
   - One of the most serious problems of rural and peri-urban areas is water supply. How can you address this issue?
   - The dependence of rural and peri-urban communities on fuelwood has detrimental effects on health and the environment. Suggest an alternative way of meeting the community's domestic energy needs.
   - Use your Engineering expertise to solve one of the other problems experienced by your community.

COTTONDALE : COMMUNITY PROFILE

Cottondale is located in the lowveld about 10 km east of Acornhoek which is near Klaserie in the Eastern Transvaal. The northern side of the road through Cottondale is in Gazankulu (Shangaan speaking) and southern side is in Lebowa (Sotho speaking). The information refers to the Gazankulu side of the settlement.

Cottondale is a mixture of the traditional and the modern with a few old thatched huts, but most buildings being rectangular with corrugated iron roofs secured by rocks placed on top. It is a sprawling village, with each homestead surrounded by a piece of land on which they cultivate mielies, ground nuts and various vegetables (mostly indigenous). Families do not have access to any other land. There is a railway station where taxis and bakkies can be hired. Coal can be bought from the coalyard at nearby Acornhoek. The village has a clinic and a large school is being built.

Wood is collected 6 to 10 km from the village. Very little dead wood is available in the immediate vicinity, although villagers sometimes use roots dug up for fuel. Some women said that they even went as far as the Manyeti Game Reserve, about 30 km away by truck, where they climbed a fence and braved whatever wild animals there were just to be able to collect some wood. Some wood is also available from state and commercial plantations in the area.

When interviewed, the residents of Cottondale listed their main problems and needs as follows:

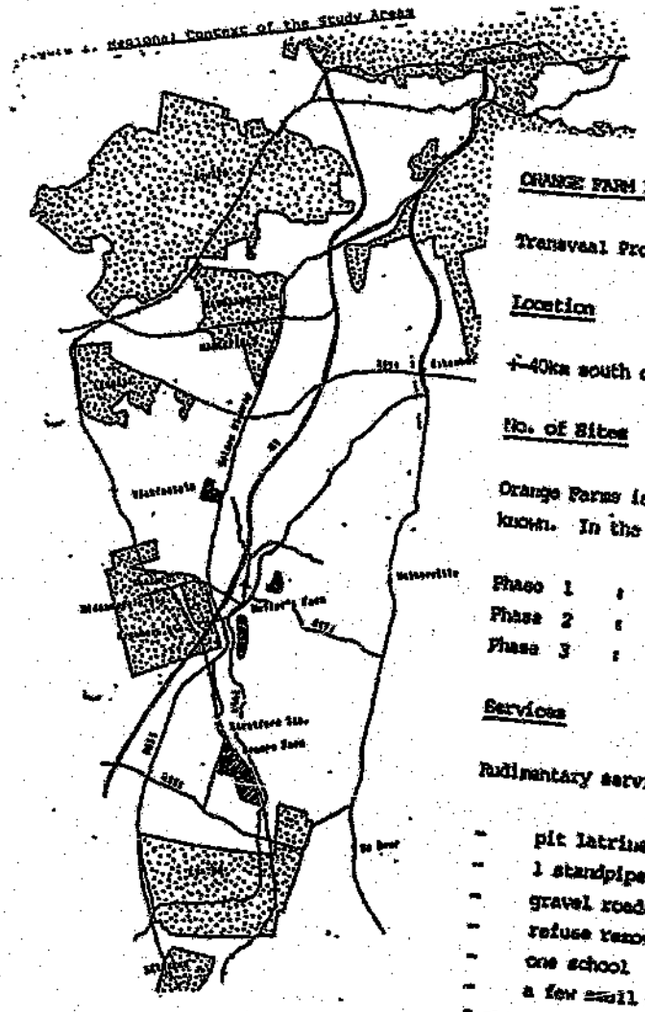
Water supply (77% of people interviewed listed it amongst the top 3 problems)
Fuelwood supply (64%)
Food (43%)
Money and employment (36%)
Housing (30%)
Health and education were mentioned by some.

Generally the people interviewed could not suggest solutions to their problems as in many rural areas morale is low and villagers cannot see any way out of their difficulties. There was generally a stunned silence when interviewees were asked to suggest solutions to their problems and some felt that the government should be responsible for meeting their needs. But the villagers thought that the following factors would make the village a better place to live in:

Improved water	(65% listed this amongst top five suggestions)
Job opportunity	(27%)
Electricity	(25%(
Woodlot	(19%)
Shop	(19%)
Housing	(13%)
Electricity	(25%)
Phones	(10%)
Hospital, clinic	(4%)

(Adapted from Anton Eberhard : Energy consumption patterns in underdeveloped areas in South Africa, Energy Research Institute, UCT).

Figure 4: Regional Context of the Study Areas



ORANGE FARM PROFILE

Transvaal Provincial Administration Site-and-Service Schems.

Location

+-40km south of Johannesburg

No. of Sites

Orange Farms is expanding rapidly and the anticipated number of sites is not known. In the short term 3 phases have been developed.

Phase 1	:	4381 residential erven
Phase 2	:	2982 residential erven .
Phase 3	:	4000 residential erven.

Services

Rudimentary services are provided:

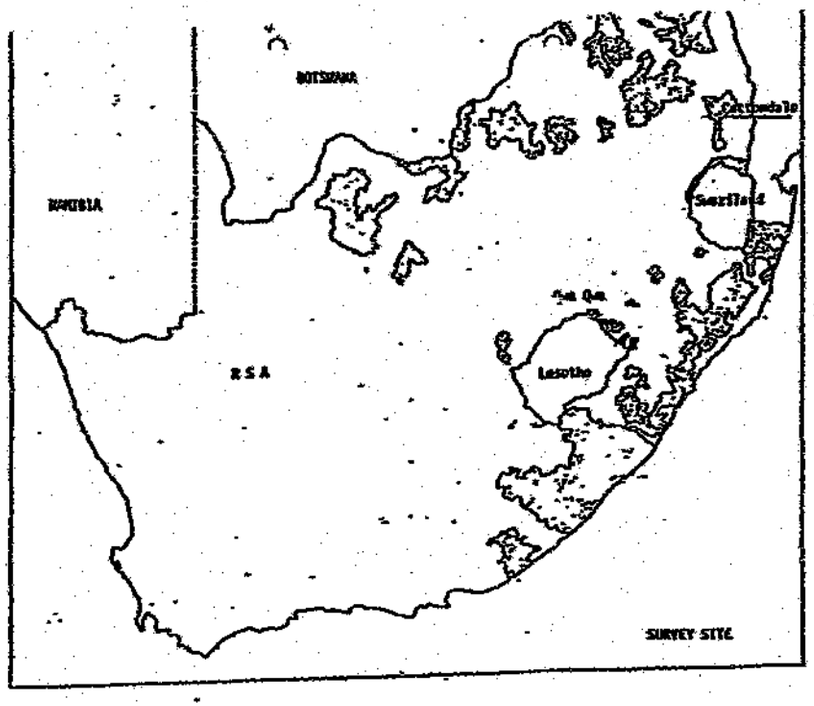
- pit latrines
- 1 standpipe per 32 erven
- gravel roads
- refuse removal.
- one school
- a few small clinics

Cost

Purchase price : R500 per site
Rental : R10 per site/month
Service charge : R29 per month.

Housing

TPA is providing finance for residents of Orange Farms to purchase private



GRAPHIC COMMUNICATION

Engineers are expected to be skilled not only in numeracy and literacy but also in graphicacy i.e. the ability to present and interpret data of all types including statistics in a non-verbal form.

Information which is not given verbally may be presented in the form of a graphic device such as a graph, diagram, chart, etc.

Why use graphic devices?

Graphic devices may be used for a number of purposes:

* to complement information in the text
* to explain
* to simplify
* to summarize, etc.

The advantages of using graphic devices to supplement a report or oral presentation are:

* The reader/listener can visualize the information more quickly and easily.
* Different components of the information may be viewed simultaneously.

What are the features of good graphic devices?

For a graphic device to be successful, the following general points must be considered:

* The device must **facilitate communication**. A badly drawn or unclear graphic will confuse rather than help your readers/audience!
* The device must be **appropriate**. Do not, for instance, try to show a complex relationship by means of a pie chart.
* The device must **clarify** the information. A pie chart or simple table might sometimes present the information more clearly than a complicated graph.

The graphic device must further:

* be neat and accurate, clearly labelled and have a title/heading
* be easy to understand and interpret
* be referred to in the report

Which graphic devices to choose?

The choice of a graphic device to illustrate a particular point will depend on a number of factors:

* the type of information
* the purpose of the report
* the audience for whom the report is intended

Some examples of graphic devices are illustrated below:

BAR CHART:

Used to show all the items in a particular group; not as accurate as a table of figures.

The bar chart below shows the number of vehicles using a particular road over a week.

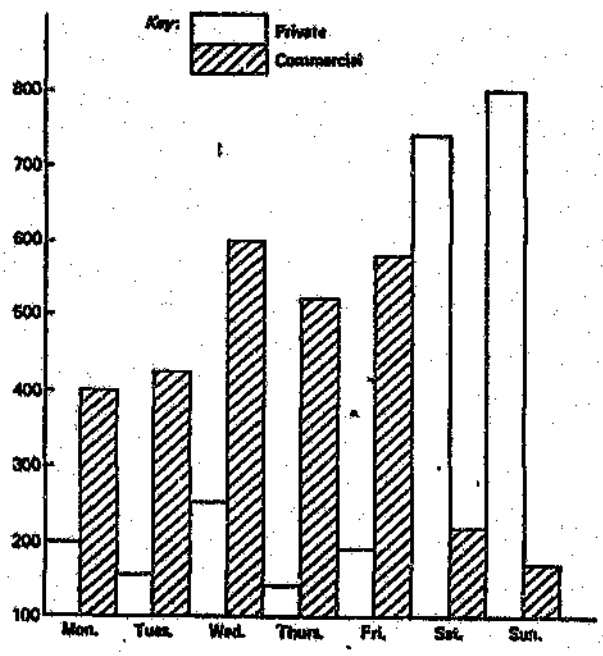


Fig. 1. Multiple bar chart

A multiple bar chart can show different groups of items simultaneously. (See fig. 1.)

A **divided** bar chart shows **subdivisions** of a category. (See fig 1a.)

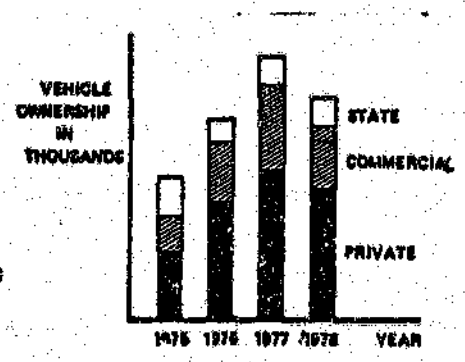


Fig. 1a. Divided bar chart

A **histogram** is similar to a bar chart in that it depicts variables by means of blocks, or divisions, along the X- axis. But in a histogram the divisions are irregular. For example, a hospital survey shows that its patients fall into age categories of different sizes. (See fig. 1b.)

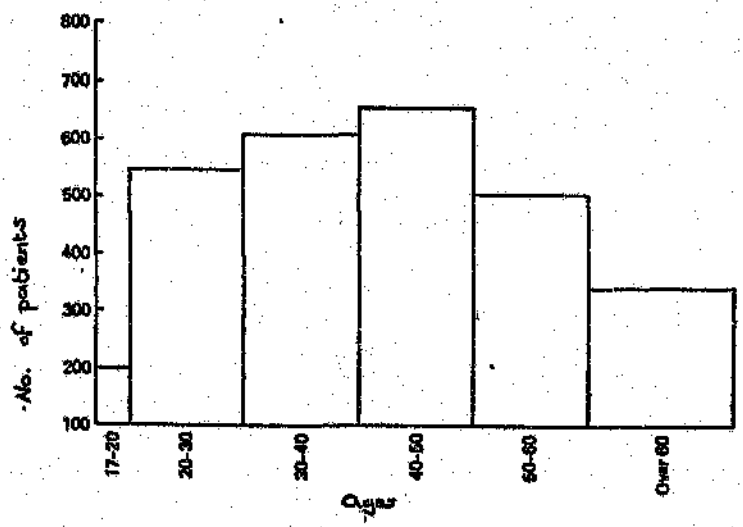


Fig. 1b. Histogram

PIE CHART:

Used to show proportions; shows how an item or unit is divided.

Not accurate enough for detailed scientific use.

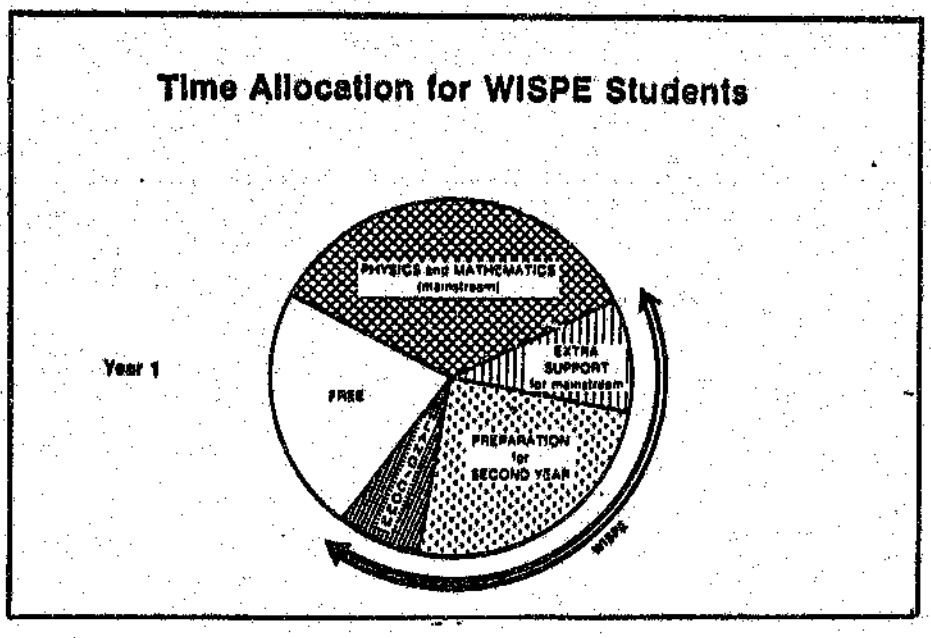
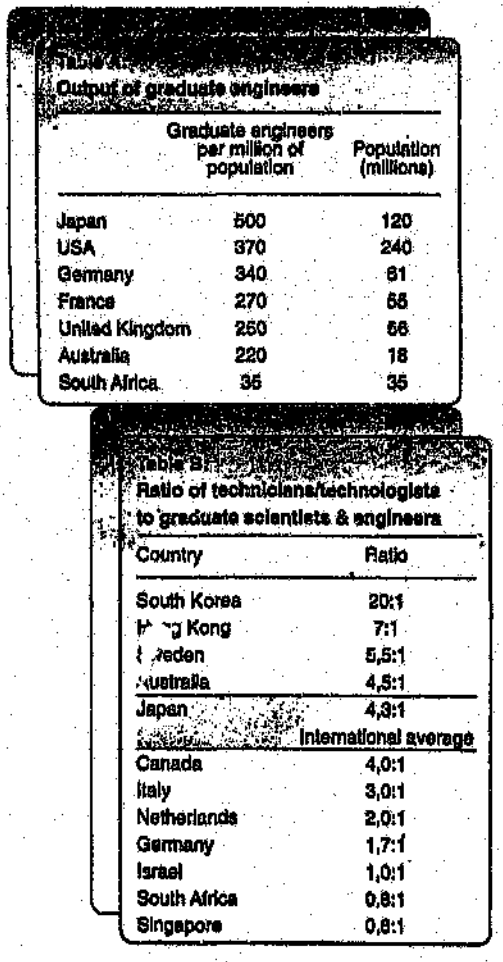


Fig. 2. Pie chart

TABLE:

Used to present a wide range of information; does not show relationships clearly.



Output of graduate engineers

	Graduate engineers per million of population	Population (millions)
Japan	500	120
USA	370	240
Germany	340	81
France	270	55
United Kingdom	250	56
Australia	220	18
South Africa	35	35

Ratio of technicians/technologists to graduate scientists & engineers

Country	Ratio
South Korea	20:1
Hong Kong	7:1
Sweden	5,5:1
Australia	4,5:1
Japan	4,3:1
International average	
Canada	4,0:1
Italy	3,0:1
Netherlands	2,0:1
Germany	1,7:1
Israel	1,0:1
South Africa	0,8:1
Singapore	0,8:1

Fig. 3. Table

Tables are particularly useful when there is a great deal of information or if the information is very complex.

PICTOGRAM:

Gives information very simply to a general audience; cuts across language or education barriers.

The pictogram in fig 4 depicts the ratio of graduates to technicians at present, and what this ratio should be in the future.

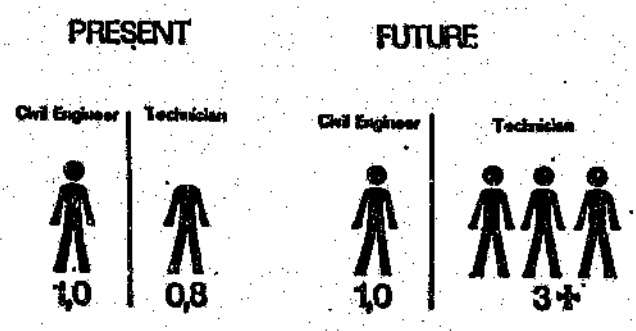


Fig. 4. Pictogram

GRAPH:

Has wide uses in scientific and technical reports; shows the relationship between two variables. Fig. 5 shows the changing pattern of the use of different energy sources.

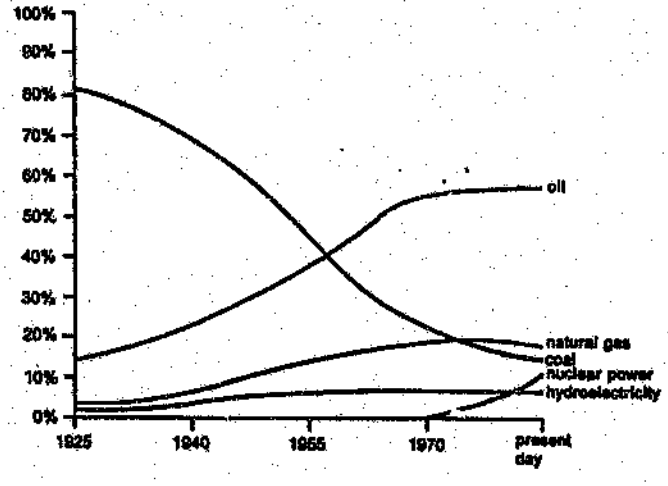


Fig. 5. Graph

FLOW CHART:

May have a number of applications:

* may illustrate a process (fig 6)

* may represent a hierarchy or structure as in, for example, a family tree or a chart which shows how members of staff relate to one another.

* by breaking a process down into a series of simple choices, may be used in computer programming (fig 6a)

* may be used to convey instructions

Fig. 6 shows the steps in the development of cholera.

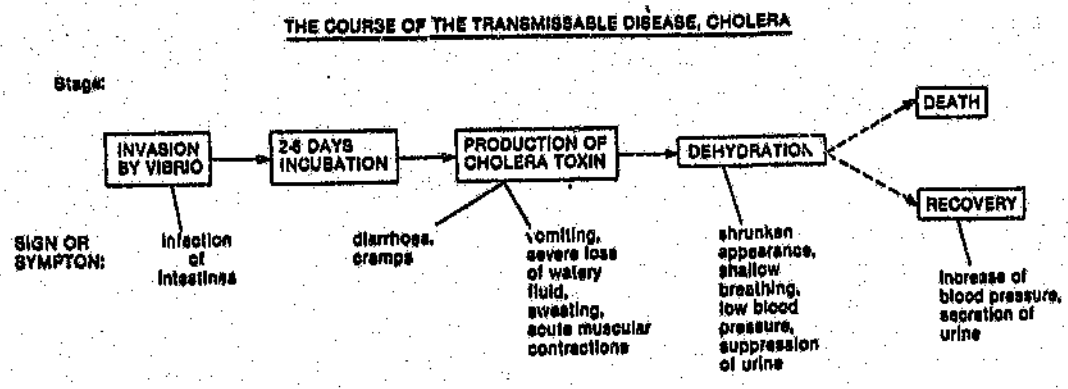


Fig. 6. Flow chart

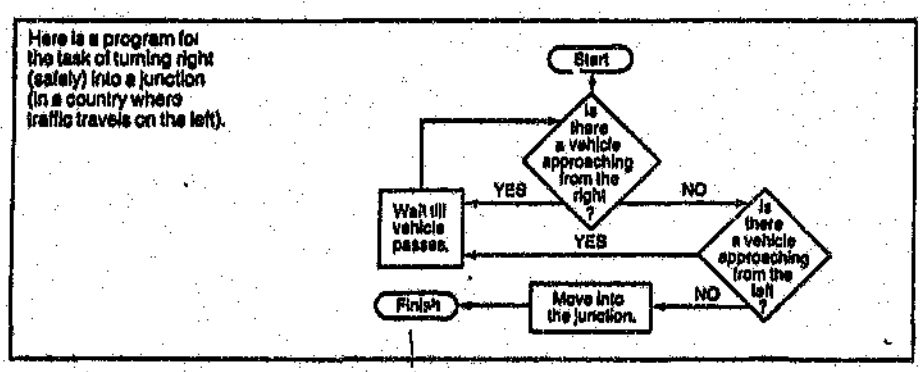


Fig. 6a. Flow chart

SCATTER DIAGRAM:

Shows the relation between two variables (either positive or negative), a wide scattering of items implies that there is no correlation.

The scatter diagram in fig. 7 shows a strong positive correlation between the two variables.

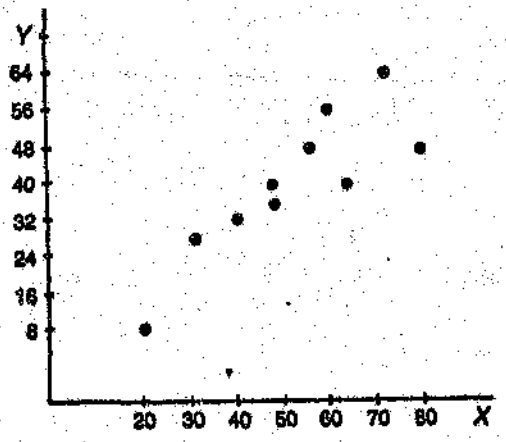


Fig. 7. Scatter diagram

Acknowledgements

Fig. 1, 1b, G.A. Lord : Know what I mean? Mc Graw-Hill, 1978.

Fig. 1a, 6a, C.G. Bruckman et al : Student notes. University of the Witwatersrand : Division of Communication Studies, 1985.

Fig 2. P. Kotecha and M. Rutherford: WISPE : What it is and how it is seen. Fulcrum, 1989.

Fig. 3. Al Smit: A race between education and disaster. Mining Survey No 2, 1990.

Fig. 4. L. de Waal : Presidential address S.A. Institution of Civil Engineers, 1990.

Fig. 5. Tom Hutchinson and Alan Waters : Interface : English for technical communication. Longman, 1984.

Fig. 6. SEAMEO ; English for study purposes. Macmillan, 1982

Fig. 7. Wilhelm Jordaan and Jackie Jordaan : Man in Context. Lexicon, 1989

WISPE LANGUAGE AND COMMUNICATION

COAL

98% of electricity in South Africa is produced by coal. The following fact sheets give information on electricity generation from coal.

SOUTH AFRICA'S COAL RESERVES

According to the 1986 Official Yearbook of South Africa, the country's mineable reserves of bituminous coal are estimated at 115 000 million tons. It is economically viable to extract 56 000 million tons of these reserves with technology currently available. Coal plays an important role in South Africa's foreign exchange earnings and it is estimated that by the end of the century, coal exports could exceed 80 million tons annually.

DEMAND FOR COAL

Generation of electricity accounts for about half of South Africa's coal consumption. The demand for coal on the domestic market is growing dramatically. Coal now supplies over 80 percent of South Africa's energy requirements – largely in the form of electricity, but increasingly as liquid fuel from the Sasol coal conversion process. Other sectors that account for large quantities of coal include mines, gas producers, railways, households, miscellaneous industries and chemical plants.

According to estimates, coal production will have to exceed 200 million tons annually by 1990 and 300 million tons by the year 2000 in order to meet the growth in demand.

ESCOM'S ROLE

Escom contributes substantially to the development and full exploitation of the country's coal reserves. The utility has made significant technological strides in the burning of low-grade coal, which in other countries would be considered waste, with no use or purpose.

Using this inferior quality coal to generate electricity, Escom is saving millions of tons of higher grade coal for export and for the iron and steel industry.

ESCOM'S CONSUMPTION

Coal
In 1988 Escom burnt 58 900 000 tons of coal. The coal consumption rate in 1988 was ,515 kg/kW.h compared with ,522 kg/kW.h in 1985. Improvement in overall thermal efficiency continues its yearly upward trend as new technology is implemented and plant upgraded.

Year	Thousands of tons	GW.h	Overall thermal efficiency %
1980	46 755,0	82 342	29,8
1981	53 903,7	95 675	30,0
1982	55 169,4	100 217	30,5
1983	55 010,2	100 738	31,1
1984	55 709,6	110 094	31,4
1985	59 486,6	113 941	32,0
1988	58 915,8	114 298	32,9

Water
The amount of cooling-water consumed in a 3 600 MW coal-fired power station is approximately 7 500 m³/hour (150 million litres a day at full capacity). Most of this (approximately 80%) is lost by evaporation.

The amount of water consumed in Escom power stations in 1988 was 262 372 Ml. Specific water consumption improved from 2,30 litres per kW.h sent out in 1985 to 2,28 litres per kW.h sent out in 1988.

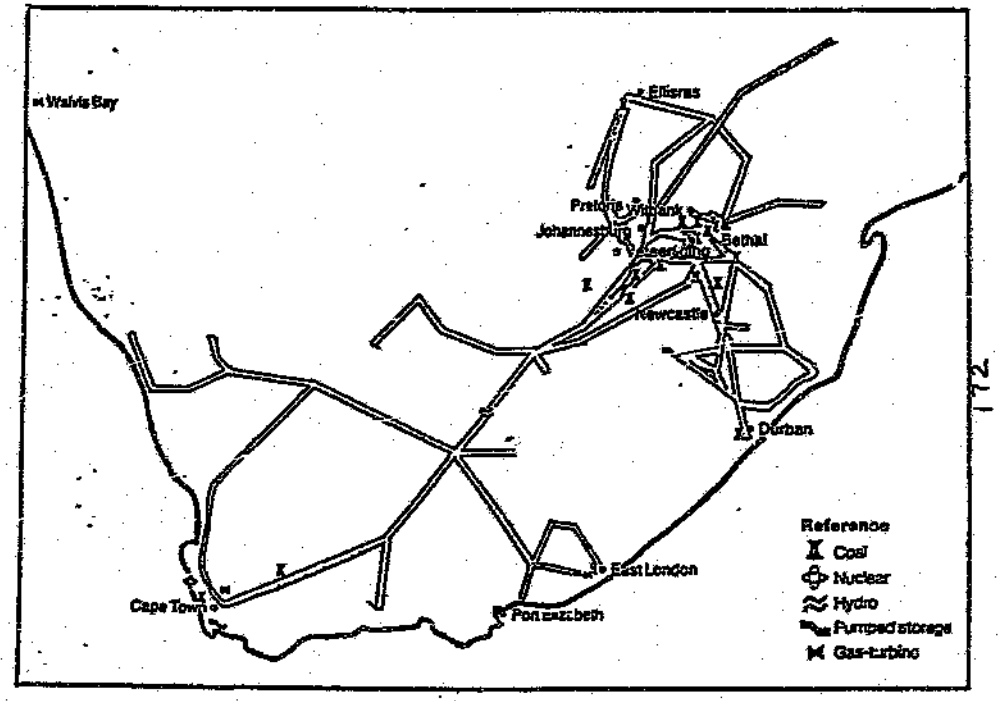
TASK 1

Plot a graph to show how the consumption of coal has changed since 1980.
From your graph, estimate the amount of coal required in 1990

TASK 3

Using what you know about electricity generation, discuss the reasons for the siting of the coal and hydro-electric generating stations shown on the map.

A SOUTHERN AFRICAN POWER GRID: ENGINEERING FOR PEACE



REPORT

Using all information you have obtained this year (water, acid rain, pollution etc), write a report, the findings of which are presented orally to Protec students to indicate some of the advantages and disadvantages of building a new coal-fired power station in South Africa.

Final Assessment

Oral presentation and written report.

WISPE 3: **LANGUAGE AND COMMUNICATION PROJECT**
ASPECTS OF GOLD MINING.

The gold mining and processing industry is the major economic "engine" of South Africa. It has the largest capital outlay and investment, employs the largest number of people (after the civil service) and is the largest earner of foreign currency. However, as in all such major and significant enterprises, there are positive and negative aspects : Gold mining is no exception.

Listed below are seven different aspects of gold mining. You are required to select one of the topics below as your area of study.

1. Problems of underground mining.
2. Health and safety in the mines.
3. Refining the ore : the recovery process.
4. Re-processing of waste dumps.
5. Power supply to the mines : electrical
   air
   water
6. Housing on the mines.
7. Mechanisation of mines.

For each topic:

a) Survey the present situation

b) Outline problems pertaining to the topic

c Present solutions (good and bad)

d) Recommend possible changes in the areas as far as a new South Africa is concerned.

Each individual will be given a folder containing useful readings for his topic. All students will be expected to add new information to this folder after a library visit and further information gathering.

In the final week of this term, the individual written topics will be collected in. Staff members from different branches will be invited for the oral presentations given by the whole group. They will help to assess the performance of the individuals.

WISPE 2 MAY 1989

Language skills

Logical sequencing (as a first step to building an argument)
Logical Connectors
Interpreting a diagram and incorporating this with a text.
Writing a coherent text, in the passive.

Topic

ELECTROSTATICS IN INDUSTRY

Introduction

It is well known that rubbing certain materials will cause a build up of 'static'. In dry weather the bodies of cars may become charged sufficiently for you to receive a shock when you get out of the vehicle and so make a path to earth for the charge. This build up of charge can be a very dangerous situation in industry particularly when flammable liquids or vapours are involved.

Task

On the attached sheet you will find some statements about electrostatics in industry and some diagrams of arrangements used in the oil industry to reduce the hazards caused by a build up of charge.
Use this information, and anything else you may know about electrostatics, to explain some of the hazards due to static electricity and how an oil company can reduce some of the risks.
You are expected to write a coherent text, using complete sentences and making use of logical connectors.

ELECTROSTATICS IN INDUSTRY

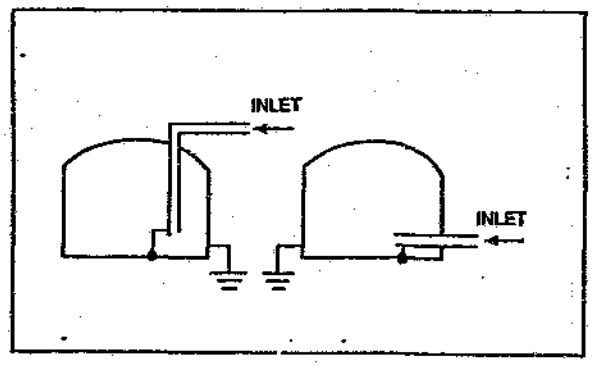
Static electricity is caused by friction.

Sometimes sparking causes a very rapid rate of combustion i.e., an explosion.

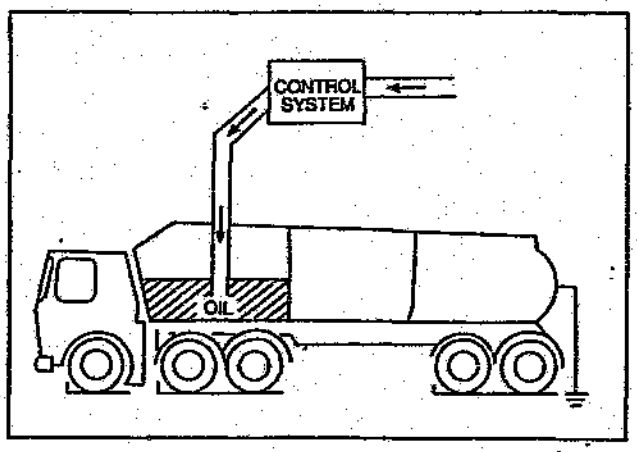
Ions experiencing attractive forces will accelerate.

Air friction can cause the metal bodies of vehicles to become charged.

Oppositely charged particles (ions) attract each other.



Only insulators can build up static charge.



Accelerating ions produce further ions by collision.

Rapid production of ions causes sparking.

Some tyres are made of high carbon content conducting rubber.

Oil falling rapidly and/or falling a distance can become charged by air friction.

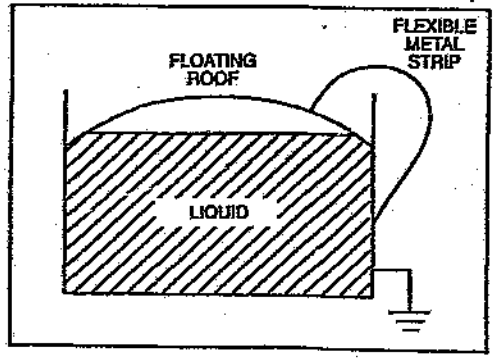
Inert gases may be used to fill the vacant space in storage tanks.

HAZARDOUS SITUATIONS

Plants with

- viscous liquids in motion — e.g., oil refineries
- materials in a finely divided state — e.g., flour mills

Finely divided particles and vapours can explode.



Movement of high viscosity liquids e.g., oil, can cause separation of charges.

Oil can act as an insulator.

Floating roofs reduce space for flammable vapours to collect.

ELECTROSTATICS IN INDUSTRY

Teacher's notes

Language skills

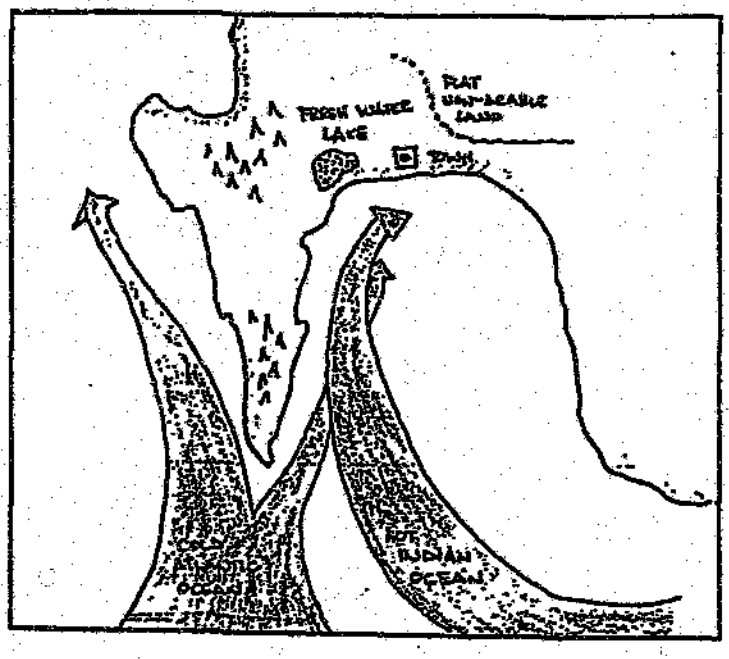
Logical sequencing (as a first step to building an argument)
Interpreting a diagram and incorporating this with a text.
Writing a coherent text in the passive.

Model Answer

Static electricity is a phenomenon caused by friction. If two insulators rub against each other they may transfer electric charge from one to the other and thus a build up of charge on the insulator may occur. In industry this can be hazardous if a large charge is generated in a situation where there is either a flammable liquid e.g., oil in oil refineries or finely divided particles such as flour in a flour mill.
Oppositely charged particles (ions) attract each other and ions experiencing attractive forces accelerate. These accelerating ions produce further ions by collision and a rapid production of ions causes sparking. With a flammable vapour or finely divided particles sparking can cause a very rapid rate of combustion i.e., an explosion.
In the oil industry the motion of oil can cause a separation of charges and so precautions must be taken whenever the oil is moved or stored. Some of these are outlined below.
The air friction over the body of an oil tanker can cause the body of the vehicle to become charged and so before the oil is transferred to or from the tanker the body of the vehicle is earthed. In addition the pipe from or to the tanker is placed so that the oil does not fall a great distance (thereby accelerating) and so become charged. The tyres of these tankers are made of special high carbon content conducting rubber which also reduces the build up of charge on the tanker body.
Within the oil refinery, once again the inlet pipes to the storage tanks are placed so that the oil does not fall a great distance so becoming charged.
In addition the tanks have either floating roofs (connected to the body of the tank to prevent differential charges building up) or the tanks contain an inert gas. Both of these reduce the space available for a build up of flammable vapour in the storage tanks.

TASK

RECOMMEND AND JUSTIFY A SYSTEM FOR ENERGY RETRIEVAL FOR THE TOWN OF IXOPO USING THE FOLLOWING INFORMATION. YOUR REPORT SHOULD NOT EXCEED 2 PAGES.



PREVAILING CONDITIONS

SEA TEMPERATURE 7KM FROM SHORE

- SURFACE - 22°C
- 500m - 4°C

CLIMATIC - HOT & WINDY

AVERAGE VALUES

DAYS OF SUNSHINE - 261 PER ANNUM
WIND SPEED - 8m/s
DAILY TEMP - 21°C

COST PER kW

ENERGY SYSTEM	INITIAL CAPITAL	RUNNING
OTEC	R19.00	4,2c
SOLAR POND	R13.80	1,9c
HELIO-HYDRO-GRAVITY	R17.00	5.1c

(ELECTRICAL ENERGY IN S.A. - 4,5c/kW)

ENERGY SYSTEM OPTIONAL EFFICIENCY

ENERGY SYSTEM	EFFICIENCY
OTEC	> 1mW
SOLAR POND	< 50kW
HELIO-HYDRO-GRAVITY	100kW to 1mW

MISCELLANEOUS INFORMATION

LAKE AREA	:	2KM²
SALT COST	:	36c/Kg
POP.DENSITY	:	100/KM
MAX LAKE DEPTH	:	4M
MIN LAKE/SEA CORRIDOR	:	0,8KM

WORKSHEET

	Helio-Hydro Gravity System	Solar Pond	Ocean Thermal Energy Conversion System (OTEC
Local Conditions			
Geographical Conditions			
Climatic Factors			
Output Efficiency			
Costs			

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

WISPE

SEPTEMBER 1989

EVALUATION OF THE LANGUAGE/COMMUNICATION COURSE

The aim of the evaluation is to elicit student response on the content and the methodology of the Language/Communication course.

It is hoped that student feedback will help illuminate ways in which the language/communication course can be improved for 2nd year students.

Please note:

Section A will be completed first and seperately from the other sections. This is to ensure that the students respond to the course as openly as possible.

SECTION A

1. Have you found the Language/Communication course useful?

   If yes, why?

   If no, why not?

2. What topics do you think have been covered in the Language/Communication course?

3. Which topics did you find the most useful?

	Topic	Why?
1)		
ii)		
iii)		

3. Can you list the 2 least useful areas below and say why they were least useful.

	AREA	REASON
i)		
ii)		

4. How do you see the connections/relationships between the various areas covered in the course.

You can illustrate this in linear or diagrammatic form. Use arrows to show the connections.

SECTION B

The areas you have covered are listed below.

Can you please rank them according to how useful, difficult, applicable and interesting you found them on a scale from 1-12. You should write (1) next to the area you found MOST useful, dufficult, applicable and interesting and a (12) to the LEAST useful, difficult, applicable and interesting topics.

	USEFUL	DIFFICULT	APPLICABLE	INTERESTING
1. The structure of reports.				
2. The parts of a report.				
3. Graphics in report writing.				
4 Logical sequencing and the use of logical connectors.				
5. Use of the passive.				
6. Input on oral presentations.				
7. Role play on Acid Rain				
8. Interpreting diagrams.				
9. Flow charts.				
10. Solar retrieval energy project.				

2. How can you list the 2 most useful areas below and say why they were useful.

	Area	Reason
i)		
ii)		

SECTION C

Some of the science/engineering related themes that we have based our materials and activities on have been:

Electrostatics in the oil industry, generation and distribution of electricity, acid rain, soda ash production, solar energy systems, pollution, chimney repair, staff canteen use study, costructing the span of a bridge and rubber manufacture.

Did you find these themes interesting?

Are there other themes/topics you could have included in the source?

The 3rd year L/C source will include a list of project-based writing. Do you have any ideas or suggestions as fas as the topics are concerned?

SECTION D

Please use this section to write down any other comments about the course.

WISPS 1990 LANGUAGE/COMMUNICATION COURSE

STUDENT EVALUATIONS : L/C 1

INTRODUCTION

The evaluation was administered by means of a voluntary, anonymous questionnaire. Out of a class of 21, 1 student was ill when the questionnaires were distributed and 14 returned their completed questionnaires.

SYLLABUS

Topics comprising the 1st year course were:

- Time management and study techniques
- Active reading
- Accessing information : previewing, skimming, scanning
- Text types
- Notetaking from lectures
- Notetaking from texts
- Oral presentations
- Problem solving
- Introduction to report writing

QUESTIONNAIRE

Students' responses to the questions are summarized below.

PERSONAL DETAILS

1. Home language

Zulu	:	4
Xhosa	:	2
English	:	5
Setswana	:	1
Venda	:	1
S. Sotho	:	1

2.. In which year did you write matric?

1978	:	1
1979	:	1
1983	:	2
1984	:	1
1985	:	1
1988	:	2
1989	:	6

3. Which matric exam did you write?

Coloured Affairs	:	1
D.E.T.	:	7
J.M.B.	:	1
House of Delegates	:	4
N.S.C.	:	1

4. Matric symbol for English

A	:	1
C	:	5
D	:	3
E	:	3
F	:	2

5. Qualifications/degree/diploma

None	:	11
Other	:	Nat. Dip. Sug. Tech. Std (Tech) (Diploma) B. Dental Therapy

6. Have you had any study skills training before joining WISPS?

Yes	:	3
No	:	11

COURSE DETAILS

1. The topics you have covered are listed below.

Please rank these topics according to how useful, difficult and interesting you found them on a scale from 1 to 9. Write a 1 next to the area you found MOST useful, difficult and interesting, and a 9 next to the LEAST.

(Students did not always rank the topics from 1 to 9. Instead they assigned each a rating from 1 to 9. The scores shown in each column represent the total number of marks awarded by students to that subject. Only 12 responses to this question could be used.)

	USEFUL	DIFFICULT	INTERESTING
Time management Study techniques	29	73	48
Active reading	37	60	48
Accessing information: previewing, skimming scanning	40	61	53
Text types	46	61	61
Notetaking from lectures	38	46	43
Notetaking from texts	41	54	51
Oral presentations	20	38	42
Problem solving	45	54	51
Intro. to report writing	32	51	35

In descending order of usefulness, difficulty and interest topics may be arranged as follows:

Usefulness

Oral presentations
Time management, Study techniques
Intro. to report writing
Active reading
Notetaking from lectures
Accessing info.
Notetaking from texts
Problem solving
Text types

Difficulty

Oral presentations
Notetaking from lectures
Intro to report writing
[Notetaking from texts
[Problem solving
Active reading
[Accessing info
[Text types
Time management, study techniques

Interest

Intro to report writing
Oral presentations
Notetaking from lectures
[Time Management
[Active reading
[Notetaking from texts
[Problem solving
Accessing info.
Text types

2. Do you think too little time was allowed for any topic?

YES : 3
NO : 10

If yes, please explain

The students who replied suggested more time be spent on:

General class discussion
Report writing
Note taking
Problem solving

3. Do you think too much time was spent on any topic?

YES	:	4
NO	:	8

If yes, please explain

Students identified the following topics as having had too much time spent on them:

Text types	:	2
Active reading	:	1
Notetaking	:	1

(One student asked for more free periods "to digest what is taught in class" but it is not clear whether he was referring to WISPE in general or to L/C in particular)

4. Were there any topics you feel the course should have covered?

YES	:	7
NO	:	3

If yes, please give details

Some students who answered YES above, did not respond. Other students listed:

Report writing skills and scientific language, "(English) for technical reports"
More demanding reports, "length of reports too short"
Exam techniques
Interpersonal skills
Memory skills
Debates, oral presentations

(One student, who was clearly confusing the L/C course with WISPE in general, listed Computing.)

5. Did you find that there was sufficient time for the tutor to respond to problems?

YES	:	12
NO	:	2

If no, please explain

Only one student responded:

"Amount of time has to be proportional to the load in that course."

GENERAL COMMENTS

1. Did the WISPE Lang/Comm course meet your needs:

YES	:	11
NOT REALLY	:	2

2. If no, why not?

"Major problems like how to use scientific or technical language were not covered properly, also report writing skills."

"It was more theoretical than practical"

3. If yes, please say how the course has helped you.

The following topics were listed. The number of students who mentioned each topic is also given.

Study skills, time management	:	7
Communication skills, and oral presentations	:	5
Report [illegible]ing, research skills	:	5
Notata [illegible]	:	2
Problem [illegible]ving, exam techniques	:	1

TUTOR COMMENTS

On the whole the course was well received by students, as was reflected by a high level of attendance and participation. The 4th block projects were especially enthusiastically tackled this year. The fact that more than half the students who completed questionnaires listed improvement in the areas of study habits and time management, although this was a relatively small component of the course, seems to indicate a growing confidence on the students' part.

Two students were disappointed that the course has not concentrated more on scientific writing techniques and report writing. In the latter case it had been made clear to students that the course would include an introduction to report writing and that this topic would be resumed in the second year. There does not seem to be sufficient justification for changing this arrangement. In the case of the former topic, viz. scientific writing, the student's concern is more valid. The usefulness of introducing 'scientific writing' as a separate slot is questionable, but more attention can be paid throughout the year to aspects of scientific writing in the various texts and readings given to the students and in their own written work.

A. DU PLESSIS
FEBRUARY 1991

WISPE II : COMMENTS ON THE LANGUAGE/COMMUNICATION COURSE - September 1988

ESROM MADONSELA

REVIEW AND EVALUATION

The following are the major topics of what we have done this year in L/C

i) Introduction to report writing
ii) Functional parts of a report
iii) Graphics in report writing
iv) 4th year project - oral presentation
v) Synopsis writing
vi) First Test: "Preparation of report on Holchimney boiler"
vii) Self assessment test
viii) How to do an oral presentation
ix) Exercise on oral presentation
x) Developing logical argument
xi) June Test: Report on Tensile strength of steel
xii) Report writing and the use of passive
xiii) Exercise on building a structure with max span using cups.

Evaluation

a) For (i); (ii) and (iii) were most useful as I didn't know much about reports and report writing. Actually, they helped a lot as I've applied the skills in the Engineering Design project.

b) For (iv) and (v) were very important as these are the most vital parts at both the project (oral presentation) and report (synopsis).

c) The First Test ie (vi) proved that I still couldn't write the best report.

d) For (vii); (viii); (ix) and (x) were helpful as I took advantage that oral presentation was easy while it wasn't. these topics help a lot personally although I still have problems with oral presentation.

e) With the June Test, I basically understood how a report looked like but the content of my report showed that I still nee some grammar exercises.

f) For (xii) proved to be an advantageous exercise as it upgraded my language and grammar mistakes in report writing.

g) (xiii) was advantageous on other parts (e.g. oral presentation) and disadvantageous on others. (Exercise was not technically orientated).

As mentioned this exercise proved that I still needed to upgrade my oral presentation skills. It discouraged my report writing skills because there wasn't much technically I could say.

General

L/C helps but I think the pace we are moving with makes L/C ineffective. Looking at "Technical Comm." notebook which is a 2nd year mainstream course one see how broad a spectrum they cover.

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

WISPE II : COMMENTS ON THE LANGUAGE/COMMUNICATION COURSE - September 1988

AT MABUZA

TOPICS COVERED

1. Technical report writing (Mr Bruckman).
2. Graphics and oral presentation.
3. Writing of a synopsis.
4. Writing laboratory reports.
5. Usage of some passive in report writing.
6. Design tasks and oral presentation.

The language and communication course this year was not badly structured as compared to last year's in relation to students' aspirations. The above listed topics were covered since the beginning of the year to today.

I have grouped the work collectivaly into the six categories above. The main section that I benefitted most from are technical report writing, usage of the passive and the types of presentation we did. I learnt more about being able to transform the informat I have to the next person orally, graphically and in writing.

The only thing I would like to add to my report is that, instead of repeated by giving the students tasks which have been structured before to work on, they to give them same tasks will be tackled by the student from scratch, of course with the tutors help in between. This will give a clear indication if what you are doing is really landing in the correct place. This is because from third year students will have to start some tasks on their own from scratch.

Therefore for the students to apply effectively the knowledge acquired they must have some sort of practice. The construction of a span task was one step towards what I am trying to convey to you. If you can try to work out tasks that will match most of the topics that you cover and test whether the students really follow what they are learning. That will benefit the students very well.

THE WISPE VISIT James Garraway 16 - 20 october 1989.

What is the WISPE program for? Ostensibly to assist non-traditional students in gaining an engineering degree. This is done (I surmised) by extending the degree from 4 to 5 years and filling the subject spaces so created with a) a language course b) extra lectures by engineers around the mainstream Physics and Maths lectures and c.)elements of other engineering courses. So, students have a full program.

I was mainly interested in the language course and the form this took relative to what sorts of language needs engineers have and other engineering courses. Of particular interest to me was how engineering tutors/lecturers and language teachers co-operated in their teaching and the power relationships between the two. I saw the latter as important in that academic skills, like analysis and synthesis, are often subjugated in favour of strong flows of content. Or, they are 'taught' by content people as if knowing them is being able to use them successfully in a variety of situations. Unlike bits of content, academic skills embrace all or many content bits and thus a more justifiable teaching model should give priority to skills over content. In terms of how to teach them, I think that this is what we, as applied linguists in a university backdrop, are best qualified to do. I say this because firstly we aren't content driven and secondly our understanding of skills learning is strongly influenced by current pedagogical practice (e.g. Millar et al). This thread of academic skills learning is an important one to me in that it links learning ,engineering rhetoric , authentic texts and co-operative teaching methodologies.

Surface and deep learning

Using surface versus deep learning seems a good place to jump into the WISPE program. By this I mean the difference between students knowing a particular set of academic skills and actually taking them on board as an internally perceived, successful writing strategy.

In engineering studies students are expected to make decisions based on a number of possible options. For instance, in year one students had to choose one form of transport for an already identified village.*

* THE VILLAGE

The SEAMEO books described a village in asia and how developments in irrigation, town planning, transport, energy resources had suited the people who lived in the village. Students were asked to co-operatively design a village of their choice in S.A. including these sorts of issues. This was done without references but based largely on personal experience. After this they individually had to research and choose an option in one of the above mentioned areas.

Students had to use a number of academic skills, e.g. analysis (pulling out relevant information from a pool of information) and synthesis (comparing, contrasting, arguing around this information). Analysis and synthesis are difficult concepts. The tutors decided to set a 'mini' project to do this. In this way we hoped that

the structure of what we were trying to teach would become a effectively used part of our students' cognitive reservoir. The success of this varied. Clearly some students knew what they had to do but included fairly nonsensical content material; they went through the motions of informed choice. Assuming the students could analyse/synthesise, how could they begin to use it effectively? One method would be the 'Feuersteinish' one. This would involve finding a very simple situation in which a/s is used by an individual and blowing this up into practicing a/s on a number of increasingly complex value free tasks. A/s would be taught concurrently in particular subject areas e.g. making choices in the language classes (engineering choices) and in the support tutorials in maths and physics. However, this still doesn't necessarily mean that students have deep processed a/s. They might well perceive it as externally imposed on them and thus exhibit it when asked (but not always successfully).

So, how do we 'activate' internal mechanisms? One suggestion would be to use peer editing as a means of allowing students to choose an a/s cognitive approach as the best method to do a problem. Perhaps through not imposing this structure (e.g. a/s as a cognitive approach), the usefulness of such an approach in an agreed upon way, which satisfies individuals other cognitive structures, could be 'taken on' by students.

Such a method would mean that students would be asked to do an open-ended problem-solving writing task. We could then use this to work out appropriate and inappropriate approaches to dealing with information in some sort of co-operative way . Important in using this methodology would be the authenticity, both to students and to engineering discourse, of the problem solving situation: this would make both student involvement and transfer to mainstream engineering more likely.

Engineering rhetoric

Engineers are expected to make feasible decisions on design and implementation based on a number of local criteria. This is the rationale for a problem solving approaching on the language course. However, first (and possibly some of second) year engineering involves mastering techniques which are only used in problem solving at a much later stage (drawing, maths and physics). Thus, the link between the problem solving language and the mainstream enginering courses at an early level might be a bit obscure.

What then is the role of the subject tutorials? To show how maths and physics do have an engineering content (the maths is taught by an engineer) and so bridge language and first year engineering? This seems a good intermediate structure which we could use at UCT. We could structure ASP support tutorials in various Science subjects and have these following an academic skills methodology taught and co-ordinated by language teachers in the central ASP unit. The tutors would probably have to concentrate on only a few content areas, because of limited time and the contents suitability to language skills teaching.

Role of engineering in society.

Presumably engineers are concerned with the research design and implementaion of structural projects. Obviously this isn't an apolitical task and could involve working within local democratic structures , as well as teaching engineering to non-engineers. Engineering training doesn't deal with either of these areas. Language courses, however, do look at learning and teaching in non-hierarchical, co-operative ways and tend to use more people-orientated engineering projects as 'language fodder'. Thus language courses may inadvertantly fill gaps in general engineering training. This leads into the next section, what sort of authentic engineering information do we as language teachers use?

Pit latrines

As teachers we often try to use what we think are familiar situations to students as ways into exploring unknown situations. Also, our limited engineering knowledge limits the complexity of tasks which we are prepared to take on to the more popular engineering situations. Thus we can end up with content matter that is insulting to engineering students (e.g. pit latrines) in that it pre-supposes a rural or economically under-developed student background. Linked to this would be a sense of what we see as important: for example, the pros and cons of upgrading older established townships rather than removing residents to new distant, housing estates. Such content matter we would assume to be familiar to most of our students and thus comprehendable as well as dealing with a central engineering issue to RSA, housing. However,our students' perceptions of this might be that its patronising in that its for blacks and that real engineering is about motorways and airports.

All three years focus on problem solving . This involves choosing a particular engineering solution from a variety of choices , given a set of local circumstances. Students would be asked to justif ythis choice in writing and show why ather options were unsuitable. Interestingly , this style of writing seems more similar to that of Arts and Social Science than to Science. Science writing at a lower level tends to be descriptive rather than justifying one argument as opposed to another.
There seemed to be a hierachy of problem solving from years one to three . In year one Students relied to a large extent on their personal experience in order to problem solve (e.g. the village project.). In the second year their projects were more objective thuogh still involved Experiential elements. E.g. the most suitable energy source for an underdeveloped area in S.A. . In third year the projects were much ' colder ' in that they involved decisions in which the engineering concerns had precedence over the people concerns , e.g.. the creep project and siting an airport. In the latter case the students debated the siting of a hypothetical airport relative to the needs of different areas. Interestingly they used engineering knowledge as well as their own experience and political understandings in order to try to solve the situation. Students seemed quite animated and were in no way thwarted by the content matter.

This approach is consistent with teaching skills via familiar situations then applying them to increasingly abstract ones. I think we could use a similar approach in our research reports .

I think we at EAP could use a more hierachial approach to problem solving write ups. We could begin with the more accessible research

projects, like designing a wood stove for underdeveloped areas ,then use this access to p. s. skills to ease p.s. write ups in more abstract research areas (e.g.nuclear structure).

Team teaching

I found this a very useful experience. We planned and taught a Y 2 double tutorial with a tutor from 4th year engineering. The topic was an appropriate energy source for a hypothetical underdeveloped settlement in South Africa. We started with a fairly typical engineering report title 'Choose and justify an appropriate energy source ...'?

We then gathered and honed suitable lecture material and readings, both in terms of the academic skills and engineering content. The delivery of the lecture involved a description of the sorts of skills needed to elic' information (from the linguists) as well as a description of ne situation and the alternatives (from the engineer). I found that students responded equally well to the linguistics and engineers in terms of help in gathering information. I think (as we discussed) that the project could be enlarged to take on a real situation to solve (e.g. Lawaaikamp upgrading) and could include more than one possible choice: thus students would know that there was not an already decided upon answer to match but that their own decisions could be valid so long as they were backed up.

Picking up on a point made earlier in the text, I feel that its important to donate an equal or higher status to the linguists in a team teaching situation. An obvious way to do this would be to sandwich the engineers' input between very directed skills input. E.g. a broad outline of the skills required and the form of the final write up as an introduction then a detailed description of how to deal with an aspect of the engineering material (e.g. filling in a comparative table) after the engineering input.
A further acccentuation of the skills approach , i think , could come from incorporating Grellet style excercises around lectures and readings . For e.g. choosing a main idea from a list which best sums up a written or spoken piece of text (analysis). Or , ordering and linking jumbled text (cohesion and sentence level synthesis).I_think these sorts of excercises are done in wispe but perhaps they could be used more frequently and become progressively more difficult.

In EAP we base most of our reading and writing around descriptions of research projects being done by the mainstream first year lecturers. The write up involves describing the research problem and how the researcher set about investigating or solving it . We thought this would mimic both elements of practical write ups as well as elements of the structure of Science texts.Our 1/2 year evaluations indicated that students did find the reports useful in their own Science writing We wanted to use the lecturers as a way of giving credibility to our course as well as to involve them in some aspects of team teaching .The latter was in terms of outreach to lecturers of the sorts of problems non traditional students at UCT experience with Science knowledge . We hoped this could be the start of content and methods evaluation in Y 1.
In terms of credibility and effective skills teaching we could explore the use of senior Science students and tutors as team teachers. Students would probably be more open and critical than would be the

case with lecturers. Also , we as language teachers could assert our language/skills needs over those of content learning.

Process diagrams ;cohesion and coherence

These appear frequently in popular engineering texts . At wispe students were encouraged to describe process diagrams as well as develop diagrams from process descriptions. I think this is a really usefull skills excercise , both from the point of view of understanding process diagrams as well as encouraging the identification and linking of main points. This leads back into the issue of how to teach sentence level cohesion and overall coherence in students' writing. My own experience in EAP Science is that they often fail to see where links should be drawn or to position thir writing within some sort of overall context. They tend to omit or be unable to articulate their internally understood cohesion and coherence . I think this is a problem general to all Science students through the sense of audience being destroyed by being made to write the correct answer- often a regurgitation of fact rather than an evaluation or processing of fact.I believe that this is a valid critique of Science teaching in general where students are expected to match templates rather than explore and explain a variety of possibilities. It is through having to convince a reader of your perceived validity of a particular idea that , i think , cohesion and coherence are best taught.

Student perceptions

This was difficult for me to assess in any real way after limited exposure to the students. However , the first thing that struck me was the high attendance , particularily at such a late stage in the year. Students i worked with in year one seemed to be quite confident in performing writing and reading excercises and questioning me. They worked well together and believed that the language course could help them in mainstream engineering .Some of them thought that the Wits engineering course was unneccessarily difficult and that they did not believe that they could pass it.
The year three students were very interesting . Initially they were resistant to the worksheet we were working on ;they said it was not the sort of thing they could do because it was a mixture of chemical and civil engineering. This was followed by a criticism of the relevance of the course itself ;they felt that it was a repetition of the previous two years and that another engineering subject should replace it . However, as we talked about the worksheet problem to be solved they became very engaged and questioning about it . They tried to fill in content gaps which had been left out by the writers. I found this very rewarding in that i could join in the creation of meaning as a peer rather than a teacher . I think these were extremely skilled problem solvers!

Overall perceptions

Generally i think the language course is varied in its methodology and interesting and authentic in its content.I think that students gain writing and reading skills within an engineering context.

One of the most interesting parts for me was planning with the engineering student tutors .Working with subject people seems to

involve balancing conservatism and overenthusiasm. At WISPE i thought the latter dominated ! In both cases I think it is hard for the language people to maintain a clarity of skills purpose while still remaining within an authentic engineering situation.
In my course i tend to emphasise and extensively practice language skills in each content cycle. As i mentioned earlier , i think more of this could be done within problem solving content areas , particularily reading skills. However i sense that i might overemphasise skills to the detriment of Science authenticity.
I liked the small bit of peer group editing which we did . I think it is a promising approach in terms of students learning the structure of engineering discourse.
I only saw one physics tutorial . This was a repeat or additional information to that given in the lectures. Students were fairly active in their response to this but i felt it still followed a largely lecturer student mode. I thought it might be useful for tutors to try and mix information from physics and maths with problem solving techniques similar to those used in the language courses.

WISPE 1: LANGUAGE AND COMMUNICATION
ASSESSMENT: SEPTEMBER 1989

Comments:
The results of the September assessment have been very disappointing but with more hard work and attention to detail these marks can improve. There seem to have been three major problems in the answers:

* Students did not consider carefully enough what was expected of them.

* Students had not paid nearly enough attention to the readings they had been given. Their own notes were clearly inadequate to answer the question.

* Students tended to quote from the texts they had been given without attempting to express the concepts in their own words. This makes any examiner uncertain how much the students have actually understood and they will consequently be heavily penalized.

Here is a suggested way of approaching this particular topic:

Read the topic carefully. This is crucial! Identify the key words. Pay attention to the examiner's instructions.

Look at this sentence:
Why is it important to find alternatives to energy derived from fossil fuels?
Note that the question does not ask for alternatives to oil or current oil reserves. Many students made the mistake of concentrating on oil and ignoring the other fossil fuels.

You were also asked to discuss the alternatives and this discussion should have included some comment on the advantages and disadvantages of the options you mention.

The examiner's instruction was that the answer should be a page long. This is quite short. It meant that you had to concentrate on the main points and avoid unnecessary detail.

Draw up an outline for your answer. You can do this by asking yourself a number of questions such as given below.

* What are fossil fuels?
* What has caused our present reliance on fossil fuels?
* How long will fossil fuel reserves last?
* What will happen if our reserves run out?
* What are the alternatives (as suggested in the texts)?
* What are the advantages and disadvantages of the suggested alternatives?

Now read the model answer and compare it to your own!
commen
9/89

The following questions have been designed in an attempt to build up profiles of the types of language and communications courses at present being implemented in Southern Africa and the types of students for whom these have been designed. The questions have therefore been grouped under various headings. We should be very grateful if you could answer these questions as fully as possible and send us the completed forms by 11th JANUARY 1991.

LANGUAGE AND COMMUNICATIONS COURSES FOR ESL STUDENTS

INSTITUTION ..... FACULTY/DEPARTMENT .....

NAME OF COURSE .....

[Please tick the appropriate boxes]

(A) STUDENT CHARACTERISTICS

Academic background

1. What are the academic requirements required for entry?
   a) O' Levels, ☐ A' Levels, ☐
   b) Matric ☐
   c) Specific subjects. ☐ Please specify .....
   .....
   .....

2. Which subjects, if any, are compulsory for entry onto the course? .....
   .....
   .....

3. Are English 1st language students accepted? YES ☐ NO ☐

4. Do students write proficiency tests for entry into the institution? YES ☐ NO ☐
   If no, how is their English Proficiency level determined?
   .....
   .....

STUDENT SELECTION

(1) Are there any pre-requisite subject requirements for entry onto your course? eg, science, maths etc.

.....

If no, do you have science students on your course

YES ☐ NO ☐

(2) Are there any bursaries available for students on your course?

YES ☐ NO ☐

If no, how are the students funded?

.....

.....

(3) Is there a limit on the numbers for your course?

YES ☐ NO ☐

If no, go to section C.

If yes, what is the maximum number of students? .....

(4) Is the course voluntary ☐ or compulsory ☐

(5) If the course is voluntary,

(a) do students apply ☐

(b) are students advised by support staff ☐

(c) are students recommended by mainstream staff ☐

STATUS OF THE COURSE

(1) Is the course credit-bearing? YES ☐ NO ☐

(2) Must students pass/meet a proficiency level to proceed with further study? YES ☐ NO ☐

(3) Is the course integrated with other academic courses?

.... ☐ ☐

(D) COURSE DESIGN

(1) Briefly outline the rationale for course establishment and design. (Please attach appropriate documentation if available)

(2) How long is your course? 6 months ☐

1 year ☐

more than 1 year ☐ (please specify)

.....

(3) Please list the units/topics by year, giving an indication of time spent on each one.

YEAR 1 .....

YEAR 2 .....

(4) Is your course contextualised? YES ☐ NO ☐

If yes, into which subject area? .....

(WE SHOULD BE GRATEFUL FOR ANY EXAMPLES OF YOUR MATERIAL.)
(THE MATERIAL WILL BE TREATED IN CONFIDENCE.)

(5) Which of the following methods do you use? Please rank from most used = 1 to never used = 7

small group discussions ☐

whole group lecture input ☐

student presentations ☐

role play ☐

individual assignments ☐

group assignments ☐

projects ☐

(E) STAFFING

(1) How many member of staff are employed?
Full-time? ☐
Part-time? ☐

(2) How are staff recruited?

.....

.....

.....

(3) Are staff faculty-based? ☐
course-based? ☐

(4) Do staff team-teach the course? Always ☐
Frequently ☐
Never ☐

(5) If team-teaching is employed, what is the team composition?

Please give an example .....

(6) Are any other teaching methods employed?

.....

(7) Are staff seperately renumerated for work on the course?

YES ☐ NO ☐

(F) ASSESSMENT AND EVALUATION

1. How are students assessed?

Terminal examinations YES ☐

Continuous assessment YES ☐

Please specify .....

.....

If you use a mixture of methods, please describe

.....

2. How do you evaluate <u>the course</u>? You may tick more than one box.

student evaluation ☐
staff evaluation ☐
faculty ☐
departmental ☐
other staff ☐
external ☐

Please use space below for any other comments you would like to make

.....

.....

.....

.....

.....

.....

I WOULD LIKE A COPY OF YOUR SUMMARY OF REPORTS

YES ☐ NO ☐

Appendix 15: Main Topics and Sub-topics Identified in a Content Analysis of EAP/ESP Course Outlines

1. WRITING

lab reports, examination answers, researched paper, exploiting iconics in a written text, job applications, major written project, journal writing, autobiographical portfolio, argumentative essay, writing as an interactive process, gathering and organisation of data, cohesion and coherence in academic discourse, editing, analysing essay topics, integrating information from different sources, paragraph construction, essay development, developing logical and systematic lines of thought in an essay, writing summaries, criteria for assessment of written work, emotive writing, organisation and ordering of ideas, revising and editing, error analysis, compiling a bibliography

2. READING

effective reading techniques, reading journals, comprehension and language skills, reading academic texts, topic analysis, text structure, improving reading speeds, accessing information, critical reading in a university context, different reading for different purposes, skimming previewing: scanning, extracting main ideas, eye movements, referential reading, critical reading: fact and opinion, figurative language, reading symbols, vocabulary skills, coping with scientific texts, structure of information in science texts

3. LANGUAGE / GRAMMAR

(sentences, subjects, verbs, compound sentences, adjectival information, adverbial information, nouns, ideas in sentences, sentence combining) one course,
cause and effect, tenses in English, mass and count nouns, use of the article

4. COMMUNICATION

interpersonal communication
communication in the organisation
small group communication
communication theory, appropriate styles of communication at university level
business communication
social communication
strategies for effective intercultural communication
nonverbal communication
small group work and communication
professional correspondence
persuasion

5. ORAL SKILLS

oral summaries and reports
theory, practice and self criticism (video tape)
physical presentation of speeches, public speaking

6. EXAMINATION TECHNIQUES AND PREPARATION

Time management in tests, comparing good and bad essays, multiple choice of preparation, what you get marks for

7. LISTENING

The English sound system
Language variation and the new Englishes, patterns in stress and intonation, phonological variation
Listening for main points, marker words in lectures

8. RESEARCH ASSIGNMENTS

Investigation skills

9. REPORT WRITING

10. NOTETAKING

Notetaking from a written text, notetaking from a spoken text, storing notes, comparing notes from lectures

11. ORGANISATION OF STUDY TIME

Making a study timetable

12. GRAPHICS

Visual literacy
Using diagrams to complement a text

13. USING THE LIBRARY

using catalogues and encyclopaedias

14. VARIETIES IN ENGLISH

15. PROBLEM SOLVING

open-ended problem solving, deductive problem solving

16. PROJECT WORK

17. USING THE DICTIONARY as a resource

18. SITE VISITS

19. MEDIA LITERACY

and video

20. MEMORY AND RESEARCH SKILLS

21. DESIGN PROJECT

22. ASSERTIVENESS TRAINING

Improvising, body language in communication
Assertiveness in the corporate world / value systems

23. COMPUTER LITERACY

List of interviewees Appendix 16

Ann Du Plessis	WISPE: University of the Witwatersrand
EAP Staff Team	ASP: University of Cape Town
Janet Flockeman	Economics and Management Bridging Unit, University Of Natal, Durban
James Garroway	EAP Science: University of Cape Town
Nicole Geslin	Linguistics: University of Natal, Durban
Pat Hill	Pre-University Bursary Scheme in Engineering, Wits
Margie Inglis	Science Foundatio Programme: University of Natal, Pietermaritzberg
Beulah John	Language, Learning and Logic: University of Natal, Pietermaritzberg
Alison Love	Linguistics: University of Zimbabwe
Sarah Murray	SPEN: University of Bopthutswana
Nadia Pandor	ASP: University of Cape Town
Francis Ralenala	Language for Science: University of the North
Marissa Rollnick	College of Science: University of the Witwatersrand
Barbara Stone	Language and Communication: University of Natal, Durban
Bessie Stephenson	Communication skills: University of Zimbabwe
Lucia Thesen	ASP; University of Cape Town
Margaret Van Zyl	English for Science Students: UNISA
Terry Volbrecht	English Special: University of the Western Cape

Wits Integrated Study Programme for Engineering (WISPE)
Engineering Support Programmes / Chamber of Mines Bldg – West Campus
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Reference: pe/PK/WISPE31

Enquiries: PIYUSHI KOTECHA

(011) 716- 5163

Date: 9 October 1991

Dear

You might recall a questionnaire which Dr. Rutherford and I sent to you earlier this year which sought information on English for Academic Purposes courses in Southern Africa for a research project.

The research attempts to explore the kind of courses which are currently being offered at tertiary institutions, the problems experienced, insights gained and practical suggestions for other practioners.

As a follow-up to the questionnaire, I would like to interview you telephonically, if I may. The decision to use telephone interviewing was made partly for logisitical reasons and partly since this method has been used very successfully by colleagues. Our conversation would be recorded and would take about 20 minutes.

I have included a brief description of the various areas of concern which I would like to discuss with you. You might like to discuss these with the rest of the project staff to ensure the reliability and generalisability of the recorded comments. (If you would like a copy of the actual questions, please let me know and I can fax them to you prior to the interview.)

A key area arising from the responses to the initial questionnaire concerns the nature of the language problem for second language learners and the best way of addressing it in a South African context. I would be interested in your views and experience of how this impacts upon your course.

I would like to conduct the interviews between the 14th - 23rd of October. I apologise for the short notice but I've recently returned from maternity leave. Could I please ask you to fax or telephone me a couple of convenient days and time for you in that period so that I can prepare a schedule.

Looking forward to speaking to you.

Many thanks for your anticipated co-operation.

PIYUSHI KOTECHA

INTERVIEW QUESTIONS

1. * Briefly, what are the aims of your course?

2. * Does the first/second language learner mix in one setting work?

3. * What is the attitude of the students towards your course? Do students perceive the course as worthwhile/useful?

4. * What would you say is the nature of their academic difficulties? Which of these difficulties does your course address? How successful have you been?

5. * Which particular skills/concepts have your students been able to develop?

6. * Are there students in your course who have severe English language problems? Can your course meet their needs?

7. + Do you think that students should be selected for courses like yours on the basis of proficiency tests or on the basis that they are second language learners?

8. + Is your course given enough recognition/status in your department and institution?

9. * What kind of errors do your students make? Are they grammatical, syntactic, mother tongue interference?

10. X Which materials/activities have been particularly successful?

11. + What are the main problems that you experience? (as far as administration: timetabling, students: attitudes, handing in of assignments and mainstream staff: co-operation are concerned.)

12. X What would you say are the strengths and weaknesses of your course?

13. X Do you feel your course is achieving its aims? How do you evaluate this?

14. X Do your course aim to improve language skills or academic skills? Please elaborate.

15. + Are mainstream staff aware of the skills covered in your course? Do they re-inforce the skills/concepts covered in your course?

Appendix 18

INTERVIEW TOPICS

Questions will be formulated on the following aspects of your course.

1. Student Characteristics

   - Attitude
   - Academic difficulties
   - Skills/concepts developed
   - Range of English competence in group
   - Types of errors

2. Course Characteristics and Constraints

   - Aims of the course
   - Selection of Students
   - Recognition and reinforcement of the course
   - Administration problems
   - Mainstream staff perceptions

3. Course Evaluation

   - Relative success of different materials and activities - strengths and weaknesses of the course.

   - Achievement of aims.

SARAH MURRAY: Special English Course (SPEN), (UNIBO)

Q: **What would you say are the aims of the SPEN course?**

A. We have disadvantaged students who, in the main, speak English as a second language and therefore they need assistance with communication skills, particularly to read and write in English, read and write academic texts. So I suppose that was our goal. It's a very broad goal, we had lots of other goals, and if you look in that book that Liz and I wrote there's an example of a course which we give to students, and introduction to the course, and we specify our goals in detail, and we say that also our goals are to increase the students' confidence to make them aware of issues that are important in South Africa today. Those are also goals.

Q. **Does the first/second language learner mix in one setting work?**

A. It's very difficult to give you an answer based on UNIBO, but what happens at UNIBO is that you get people who are second language speakers in the sense that they learnt English as their second language chronologically, but who are very proficient; they're equally literate in both languages. In fact, English is probably the stronger language although it wasn't the first thing they learnt, because they went to private schools and they went to schools like Mmabatho High School and their parents tend to be university lecturers and they travel overseas.

For example they stay with the family for a year in Australia or somewhere and generally speaking, those

students have done quite well in their matric as well. Now there is a problem in the motivation of those students, you have to try and win those students around seeing that they have a responsibility to share that with the other students, but its actually quite hard to do that. I feel that if you could persuade the very good speakers of the language to become part of the group they could contribute enormously, but of course students at university have fairly selfish priorities, understandably.

Q. **What was the attitude of the students towards the course?**

A. It depended, one of the problems was if you look at our quarterly evaluation, it clearly defined that, because the kind of things we were teaching were often not demanded in the other courses, lecturers in other courses tended to say students can't write essays, so we won't ask them to write an essay, we will ask them multiple choice or short answers. So the students would complain why are we having to write these academic essays when nobody else expects us to do it. Then as they moved further up the university, by then they had left us they often found that the attitude towards the course become much more positive in the second and third year, and we used to get lots of examples of students coming back to us saying 'do you remember when we did this, can you give me whatever it was we did' so students did see the value of it, and in fact you could see a change in attitude from first semester to second semester, a much more positive approach.

There also was a difference between urban and rural students, rural students because they really struggled with the language, recognised their need for the course much more than students whose need actually was less.

Q. **Do you think that students should be selected for courses like yours on the basis of proficiency tests or on the basis that they're second language learners?**

A. If you're going to select then, it should be on the basis of proficiency. It's interesting, my experience of being an external examiner, my experience of supervising students and post graduate students, is that once you get above a ce tain basic level there are weak, first language speakers who can't write coherently and somehow, often they manage to get to post graduate level and they still can't write coherently, and actually they need help too.

But I would say its a question, its definitely proficiency rather than your first/second language situation. Obviously there's an over lap, people who speak it as a second language and haven't had the opportunity to develop complete proficiency are going to struggle.

Q. **What would you say is the nature of the students academic difficulties?**

A. The issue is the whole notion of what constitutes the theory of comprehension, our current use of how people comprehend means that its your whole experience of life that contributes towards whether you're able to comprehend them be, it in your first or second language, if you're second language you've got added difficulty of decoding and just simply identifying what a word means and the syntax

and everything else. Nevertheless a great part of comprehension even in the second language is background knowledge that you bring to the text and that's going to be made up of your knowledge of the content and cultural knowledge and there's a problem finding that students bring with them the whole culture of the school that they've been in which does not prepare them for university.

If you think specifically of language, the culture of black schools is essentially oral in my view. They hardly read at all. I've been to so many schools now through being on teaching practice at Unibo and I've seen hundreds of black high schools, and I don't think I ever go into a class in which they do reading or writing. Even if they are libraries very little use is made of them, teachers themselves don't read or write very much. Essentially it's listening and speaking a bit and so I think that's a real problem.

Another problem is simply the kind of lack of rigour in black schools, when you start to demand things from kids and that they should be rigorous and they need to be disciplined in how they write and how they read and how they study and organise, and simply that schools and teachers have got low expectations, of their pupils. So when they come to university you have to have a major debate with them about your expectations, and actually that they have got to perform at this level, and to convince them that they're capable.

The problem with black universities is that often that attitude is carried over, the low expectations and so the students don't fulfil their potential. My perception of black schools is that there is an incredible laissez-faire attitude and teachers just repeat the same thing year after

year and they don't realise the amount of effort that has to go in and you often do get highly motivated students who totally misdirect their energy through the whole rote learning approach.

Q. **Would you say the SPEN course aimed to improve language skills or academic skills or both?**

A. Both. I would say the whole approach centres around current use of language teaching and one of the current uses of language teaching is that it should be task-based, that the focus should not be on the language but achieving some task or goal so you could be going in there with a totally linguistic approach; your goal could be to improve the students' language, but you still might take that route whilst working on a task.

Our decision was to set academic tasks, to set tasks which should as closely as possible approximate what they would be required to do in another course, and their goal is to complete the academic task, but in that process they're actually addressing language. We did try to think the language element through. Just to give you one example, my identification, through experience more than anything else, of students with say writing problems is that they find it very difficult to structure discourse, they find argument discourse difficult and so we focused very much in both courses. The research shows that through reading, that you acquire familiarity with argument and we hammered away at argument structure and reading and then hammered away again at it in writing, and so in selecting academic tasks and topics, we tried to cover each argument structure.

So they had an academic task in the reading course, which focused around looking at appropriate education systems in South Africa, but the argument structure required throughout all that was compare and contrast, because there are a lot of psychologists who believe the whole business about classification being essential. The way of organising physical phenomena and cognitive skills, being important, but comparison coming very much out of that business, of the ability to classify and then in the second semester they were writing two essays.

One was to discuss whether English was an appropriate language, and that's the discussion essay which is a difficult argument structure and they spend a lot of time on it, and then for the exam for which we did a massive amount of preparation for the exam, it wasn't just like sitting the exam, we did cause and effect because that really is such an important argument structure in science and actually most academic subjects, so in teaching, or setting up a course, a language course, you would want to cover those argument structures even if their goals were purely linguistic. But we're doing it through tasks which the lecturers have asked them to write an essay on. Even grammar work and everything else would come out of that writing.

Q. **In relation to the range of activities which your students did, did you find that they're better at handling some skills than others or not, which ones were they particularly successful at developing?**

A. It's very difficult to generalise because it depends on the level of proficiency which the student comes in with. We gave students this rough and ready Oxford placement test.

I only did it in the last year. The students in my class, some were scoring bilingually, they just speak it proficiently and others were scoring just at the post elementary level, which is very very very low. Now those students were struggling simply to comprehend at the de-coding level, and they haven't reached a basic line of linguistic competence.

I doubt you would have a student like that at Wits. Now those students would struggle simply with getting the facts straight in a text, but I would say the majority of students were pretty good at comprehending it at the factual level, providing the text was sufficiently familiar to them in terms of the content. But they struggle with identifying the intention of the writer; what is the most essential message that the writer wants to convey, It all comes back to this business of argument and inference.

Q. **Are there students in the course who have severe English language problems and if so, how did you attempt to address those?**

A. Well, those were the ones I was telling you about who were achieving really very very low scores. We were all really very concerned about them, they really shouldn't have been at university. There was just no way they could cope with writing although having said that you do get the odd student who is so highly motivated, and I've had just a couple of those who've come in and you think to yourself, this student should never, ever have been admitted but yet because they seek help and they're incredibly motivated, they manage and they often do very well in an environment like UNIBO. They probably wouldn't survive at Wits so you can't generalise. The way we handled this problem was that, it wasn't until the middle of the year that we would start

to do writing. We realised that you have got students who can barely communicate and so it was that was the reason the institute did a test that meant you could see their problems right from the start with some degree of accuracy.

I would say that the tests had a pretty predictive power but were wrong for about a couple of students, and what I did with my class was put those students into a little group and I said you haven't done well on the test if you would like to come for extra help we'll have an extra session every week. And in fact, they themselves said they didn't want it once a week, they wanted it twice, and they were very keen.

We started off doing grammar and we would choose things we wanted to do, discuss and say for the next week we would do this or this and then I would review it and say what do you think we ought to do next and so on. I'm not sure that it was terribly helpful and concrete but the positive thing is that it really developed their confidence they really, blossomed. I think that its partly because they got to know me better than the other tutors so from being students who never said a word in class, they suddenly started to be students who would really contribute because they knew me very well, and they gained confidence enormously, I'm not sure why.

Q. **So what you're saying was that the backlog was too great?**

A. I think so, you know language is quite a gradual proce·, a few extra lessons a week. You can only do a bit. Their writing was still weak, very weak at the end of the year, and it's hard to know whether they're simply students who were very weak, intellectually, I don't know.

Q. **Was your course given enough recognition status in your institution?**

A. It's very difficult to say that, the institution gave it a lot of lift in the sense that it's a credit bearing course. It was compulsory but I think that attitudes towards the course from the institution depend very much on the individual, and when I first went to UNIBO, John McHaney was there and he was incredibly supportive. He had been instrumental in getting the language skills behind it, he really believed in it and he was certainly giving it priority, giving funds and everything and I think that that is how we got to the position where we got good staffing.

But then we had the misfortune to get branded politically and when all the trouble at UNIBO started. We were seen as a kind of subversive group, siding with the students and I think there were just personal problems, the people like Nadia, myself and so on being involved with staff issues. This was viewed as problematic and it was all political, and there was a deliberate strategy on the part of our Dean to undermine us. We would go and talk to them about needing staff and he would agree and everything and then you would find out that he would say something totally different to other staff.

Q. **To what extent were people aware of the kind of service that you were providing on an academic level?**

A. With some of them I don't think it would have mattered what we did, because of their own agenda. There is also a whole political problem where you'll get staff saying why should our students be treated differently from any other students and you'll get this at all black universities.

Q. **Were there particular topics or particular materials which worked well with your students? Did some things interest them more than others?**

A. It does vary from student to student. I think that the more you contextualise in the South African context the more interested they are. I used a supplement, we used to use our materials in the book as a core, and I would try and keep it up to date and if you look at the book, the teachers' guide, there are examples of materials we used. For example when we were doing graphs and the whole thing about population, it just happened to be a time when the insurance business in South Africa was getting into rejecting the effect of aids and it fitted beautifully into the topic.

One of the things with linking academic skills with language skills was the attempt to make students read critically and think critically, so we were trying to teach them about where, you know the graphs don't just appear out of nowhere, somebody researched it and how much can you rely on the research process, population data based on a census and how accurate it was and looking at all the various projections people had made in the past about population and which was right. So we started to look at the projections for South Africa with Aids and followed a discussion on the radio, I recorded that and introduced them to the whole idea of actuary and they were very interested in that. Also with the education topic we started looking at the James Moulder article, he was writing about the ANC and emphasizing primary education and we were able to compare that to Nyerere.

Q. **Did the Science/Law students also respond positively to this content?**

A. I didn't teach the sciences, I taught commerce and they responded very positively, the more academic and abstract it was the less interested they were. They were interested in things they could relate to but then at the same time you've got to make them authentic.

Q. **What were the main problems that you had as far as adminst ion, students attitudes etc are concerned?**

A. I think the main problems are structural, the real problem is that constraint of time and numbers of staff, we knew for example that all of us wanted to make our course more subject specific, but if you've only got 10 staff and we had 900 - 1000 students, every student has got to do the course, my feeling was that students must go away with something solid. It mustn't just be a mish-mash where you try and do this and that and it doesn't really work. I feel that you must establish a solid course first and then gradually develop good subjects for every course.

Q.Do you think you've found an approach which is applicable to all disciplines - would there have to be a major re-conceptualisation around the meeting of specific needs.

A. I think it depends on the nature of the course, whether its a credit course and so on. I think if what you're thinking in terms of a credit bearing course which is going to have to be suitable for the majority of students, not a minority, then I think our course was a good model. I think that the basic principles we were working on were good ones and I think the course has been quite successful in that way. I think that much more time needs to go into it, its no good doing it in a half-hearted kind of way. Subject specific work, if your're going to do it, it has to be done properly, and so you would need to do a lot of materials

development but I think you could use the basic approach that we used.

Content can change, but approach would be still valid, and you would need to change it, courses like Law there would need to be substantial changes to the content. You would need to include things that aren't dealt with at all because of the nature of Law. But I think that when you get into the business of courses being compulsory and credit bearing, that you have to take on different issues. For example we had an unsuccessful struggle to get an external examiner.

A subject-specific course, could grow out of a course like ours and by using it as a starting point, it would be really important to have an external, who was not a language person, but somebody who was teaching the first year, an external for the English for Science. You should have one external for science and one for the language.

Q. **When you were actually designing the course and during its implementation to what extent were the mainstream staff involved with this? I get the impression that a lot of it depended on your own expertise and your own knowledge of the area, does this mean that you and your team did a lot of research into what was required and then did most of the work yourselves, how much collaboration was there?**

A. There was very little collaboration, at the beginning when I set out there were only two posts, when Nadia joined me at the beginning of 1987, there was chaos in the University the acting Dean just about let anybody in. There were 1200 students and 2 member of staff. That was the very semester I had asked Liz to come and help me develop materials so she was there, and luckily we had started developing the

materials, but in that situation we were definitely trying to find part-time staff.

There is no way you can start going out doing lots of consultations and developing materials and so on. Your priority is to do your best for a decent general course and we also have responsibility for the college of education, another 3 000 students, so I had to provide the materials for the college as a whole.

But we did try and do some consultation and we did send out a questionnaire to all members of staff to all the departments, It was quite a detailed questionnaire asking them what their opinions were about the student needs and fairly detailed questions within their needs, to do say with reading and writing, and fairly detailed questions about how they used it, and then the other kind of things we did were analysing all the exam questions, that were set in one semester to see what is it that at the end of first year students are required to do, what the lecturers were working at. The return was very very low.

We had quite a lot of meetings, through the Academic Development Centre (ADC), especially back in those days when we asked the ADC to organise meetings. We invited all the staff and we had a finger lunch to try and persuade people to come. We did discuss, we gave the questionnaire and then we analysed it and then we had a meeting at which we invited all members of staff of the university to come and have copies of our findings and try and see where people agreed and disagreed.

Just to say how our materials developed, I think how they developed mainly was doing our best in difficult circumstances and constantly, I think we were pretty self

critical in the sense that we had meetings every week and we recorded all the time what was working and what wasn't working and then we revised it in the light of that in an ad-hoc way. All of us did try and work with departments in the sense of talking to people who are friends of ours. I used to talk to people endlessly to say what's your view of this that or the other, and so on and I think other members of staff did too.

Q. **Is there anything that I've left out that you would like to include in that particular course?**

A. I don't think so.

Q. **How would you characterise the SPEN approach?**

A. I would say it was trying to realistically achieve given the constraints I was operating in. We realised early on that it was totally ineffective printing units, you never produced things on time and there was a lack of photocopying facilities and a lack of money. So we put materials into booklet form and charged students for it and that how we worked, pretty much from the start.

And it was partly too because I had seen the way the old SPEN, before I came over had worked, how there were always handouts scattered everywhere and students never had them in classes, organised properly and so on and in a way that seems like a n.gative thing which is inflexible but sometimes its a positive thing because you have a core of material which can be critted all the time. You know its like putting yourself on the line by making the material public to everybody and you can respond to criticism.

Q. So, do you prefer work packs or published materials?

A. It depends on what the work pack would be like I suppose, I feel that, books are probably more practical in the long run. They're cheaper and students don't lose half of them, they can sell them at the end. There is one final thing that I would like to say is that one of the things we found, and maybe it won't be relevant, but we were writing materials for other people as well, We were writing for the College of Education and I was also writing for part time lecturers. They would come in when we're in dire need and what our materials were when we first started were very open. They tended to consist of things like readings on a theme, and the instructions would say things like discuss this in pairs and then discuss it with your lecturer and we would think that it was transparent to the lecturer how to handle this. We found that we had to make our material more and more explicit. They simply, would totally lack the confidence using the material, because they had no idea what was supposed to come out of the course, and sometimes they would actually use the materials in an inappropriate way, so what we did was to keep on building into the material more and more explicit feedback.

Q. Do you think it's possible to have some sort of training component which goes with materials?

A. I think it's vital. That's why Lynn and I wrote, we hadn't intended to write a comprehensive teachers' guide but we realised that people just didn't understand what we're aiming at, we thought that it was just so obvious, but it wasn't obvious.

Q. **You are talking about an actual teacher's training book, I was thinking of actual sessions if one can organise those.**

A. We had those as well at the Colleges of Education but it was just insufficient. The problems in black education are that everything changes so quickly. You would hold a meeting at the end of one year and you would discuss everything. We did have workshops, Nadia and Jane used to go round the college and give workshops, then at the beginning of next year, everyone's different.

In black education, things are so unstable and that's why I think, particularly in black education materials have to be explicit; clear, well-thought through, solid and maybe sometimes the creative side has to be sacrificed, you have to be solid first.

Appendix 19 (b)

BESSIE C STEPHENSON: Communication Skills; Univerity of Zimbabwe

Q. **Bessie, which students take your course?**

A. The answers which I shall give to your questions relate to my experience on the course for students of agriculture and the B.Ed. (Technical Subjects). The latter groups consist of experienced teachers who are upgrading their qualifications in order to teach technical subjects to examination classes in secondary schools. There are six different groups of students, but I had to timetable them in as two groups which combined students of different disciplines. This meant that course materials had to be based on educational methodology and could not relate to their specific disciplines.

Q. **Briefly what are the aims of your course?**

A My courses are aimed at enabling students to learn independently i.e. to take useful notes from lectures and books; to read prescribed texts with a deep level of comprehension and to be able to identify salient points: to write clear, unambiguous English in an appropriate register; to organise material logically; to set work out systematically using the academically accepted methods of citation and reference.

Q. **Does the first/second language learner mix in one setting work?**

A. There are no L1 students on my courses.

Q. **What is the attitude of students towards your course and do**

students perceive the course as worthwhile or useful?

A. Student evaluation of the courses is surprisingly positive though there are a few students who give low ratings. Attitudes however, are ambivalent. While students may see the value of the course and rate it high on teaching and presentation etc. they resent having to spend time on the course and (in the case of Agriculture) they feel that there is a stigma attached to being selected to attend the course (B.Ed. students were all obliged to attend this year).

Q. **What would you say is the nature of their academic difficulties, which of these difficulties does your course address and how successful have you been?**

A Since there are individual differences it isn't easy to answer this question. As I see it, the biggest problem for the students I teach is that they last were taught English as a subject for 'O' Level, thus even recent school leavers have not had any formal instruction in English language for two years or more. Since they have been successful in their Science subjects and have been able to get by on their present mastery of English their competence has become fossilized. To bridge the gap between their relative competence and the higher level of competence needed for academic studies is a difficult task and the course does not always succeed in remedying it. I would say that the students who have an innate language ability are the ones who respond best and benefit most from the course.

I'm afraid this doesn't answer your question. I suppose I could say that some students do have problems with all the language skills needed at university. The course is most successful in teaching new skills (ones not taught at

school) such as citation, writing reports, preparing bibliographies etc. and is least successful in addressing grammar syntax etc.

Q. **Which skills have your students mastered successfully?**

A. The skills my students have been able to master are the ones noted above as well as organisation at paragraph and essay level, and the ability to write more concisely.

Q. **Do your students have severe language problems?**

A. This year I had only one student, a Mozambican whose second language is Portuguese. I did not get much chance to find out whether I could help him since his attendance was so irregular.

We seldom have students with severe language problems because a pass at 'O' Level English is a requirement for admission to Univ. of Zimbabwe.

Q. **I am interested in your view on mixing first and second language learners in one group.**

A. This issue does not arise at UZ since about 98% of our students are second language speakers of English. Our students are selected on the basis of a communication skills tests, except in courses which have study skills components which all students attend (this applies to the initial Agriculture sessions which are held as open lectures). For UZ the issue is whether enrolment should be on the basis of selection by test or voluntary.

Q. **Is the course given enough recognition or status in your department or institution?**

A. Although at an official level our courses are given recognition, at a more practical level they are not. By this I mean that our time slots are often eroded by main stream subjects; there is no way of enforcing attendance since courses are not credit bearing; we have low priority in room allocation; we are not informed of timetable changes etc.

Q. **What kind oi errors do your students make, are they grammatical, syntactic or mother tongue interference?**

A. See answer to (*) above. Although there are problems with grammar, vocabulary and syntax, these generally do not have serious effects on intelligibility. It is the higher level skills (cf. Munby) which are more serious. Mother tongue interference does not occur to any large extent.

Q. **Which material or activities have been particularly successful?**

A. The successful exercises I have carried out have been ones where there has been close integration with the students' mainstream lecturers, particularly when the course materials have related directly to what was being taught by them. Process writing exercises covering a variety of skills based on a particular theme have also been very successful, possibly because of the integrated nature of the themes.

Q. **What is the main problem that you experience with regard to administration, students and mainstream staff?**

A. Our main problem is lack of time. Ideally a communication skills course should run for sixty hours, but we have less than half that time. Another problem, in Agriculture, is that attendance falls off towards the end of the course when mainstream subject demands are heavy. Despite the lip service that is paid to our courses, there are few lecturers who are prepared, or able, to co-operate closely.

We seldom require students to prepare assignments outside of classes since these are not usually done conscientiously due to competition from mainstream subjects.

A major problem is the mismatch between the standards set in our courses and those set by mainstream subject lecturers who exercise a great deal of tolerance. Thus CSC's teaching is not generally reinforced.

Q. **What would you say are the strengths and weaknesses of the course?**

A. The strengths of the courses are the ESP approach; integrated teaching; the specially prepared course materials and small group work. Weaknesses have already been noted: time limitation and the fact that the courses are not credit-bearing.

Q. **Do you think your course is achieving its aims and how do you evaluate this?**

A. The courses are only partly successful, as has already been noted. Evaluation of the success of the course is measured by student evaluation carried out at the end of the

courses; by noting students' progress in written work; and, occasionally, from comments made by mainstream subject lecturers and verbal feedback from individual students.

Q. **Does your course aim to improve language skills or academic skills?**

A. Though the courses are aimed at improving both language and academic skills, the stress, because of time limitation is on the latter. It is a case of addressing the most pressing needs first.

Q. **Are mainstream staff aware of the skill covered in your course and do they enforce them in any way?**

A. Despite advertising on the part of CSC, few mainstream members of staff have a clear idea of what is taught on the courses. CSC's teaching is not generally re-inforced by subject lecturers.

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