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LEARNER PARTICIPATION IN THE DESIGN OF

ENGLISH FOR BIOTECHNOLOGY

Albert P'Rayan

Senior Lecturer

Jeppiaar Engineering College,
Chennai – 600 118, India

Email: rayanal@yahoo.co.uk, raydeal@indiatimes.com

Phone: 0091-9884380861

Albert P Rayan has been a teacher, materials writer, teacher trainer and ELT resource person since 1997. Currently he teaches English for Science and Technology (EST) and English Communication Skills courses at Jeppiaar Engineering College in Chennai, India. His previous experience in the field of education includes running media education workshops for students and teachers, training teachers of English, teaching ESP courses at the Kigali Institute of Science and Technology (KIST) in Kigali, Rwanda and heading the Department of English at KIST. He is a freelance journalist and writer; he contributes a weekly column *English Matters* to the Education Express, a supplement with The New Indian Express. His areas of interest in ELT are: ESP, Critical thinking, CALL and Testing. He is working on his PhD in ESP. He has published numerous articles on social issues and ELT in India and abroad.

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ABSTRACT

Experts say that English for Specific Purposes (ESP) courses should be learner-centred in terms of course material and teaching methodology and the design of such courses should be based on the specific professional or academic needs of learners. The participation of learners in the design of an ESP course is essential in order for the course to be effective. But do all ESP course designers try to gain insight into learners' perceived needs, wants, and lacks? "Teachers may rely more often on intuition when making course planning than on informed assessment of learners' needs" (Barkuizen 1998, Spratt 1999 as cited in Davies 2006).

Since most books on various ESP and English for Science and Technology (EST) courses that are available in the market in India seem to have been designed without involving learners in the course design process, it is quite likely that they may not reflect the needs and interests of any particular learner groups. If readymade books are prescribed for any ESP course, it is the responsibility of the ESP practitioner to evaluate the effectiveness of the teaching material on the course either during or at the end of the course and provide supplementary material to enable learners to learn effectively.

The hypothesis of the study is that if learners of any proposed EST course are involved in the selection of course material (reading and listening material) and in the design of the course, such involvement of the learners will enhance their interest and motivation level, foster their critical thinking skills, make them take part in various language activities enthusiastically and result in their effective learning. Moreover, such a step would make teaching-learning process enjoyable and pave the way for achieving the course objectives.

The purpose of the research was to design a *collaborative content-cum-task based course English for Biotechnology* and to find out the usefulness and learner effectiveness of such an experiment and its impact on the ESP teacher and learners.

The paper delineates the process of evaluating the *Engineering English* course determining the learners' target needs, the conception of the idea of learner participation in the course design, the nurturing of the idea, the setting of course objectives, the selection and production of course materials, the teaching-learning of the course and evaluating its effectiveness

1. THE RATIONALE

1.1 Background

Aarupadai Veedu Institute of Technology, a constituent college of Vinayaka Mission's Research Foundation – Deemed University, Chennai, offers undergraduate programmes in nine different engineering disciplines: biotechnology, biomedicine, bioinformatics, information technology, computer science, mechanical engineering, electronics and communication engineering, mechatronics, and electrical engineering. *English for Engineering*, also called *Engineering*

English or *Technical English*, is a compulsory course for the first year students of all the aforementioned disciplines and *English for Engineers and Technologists (volumes 1 & 2)* authored by Humanities and Social Sciences Division of Anna University and published by Orient Longman was the prescribed book in the academic year 2005 – 2006.

During the academic year, around 700 students, mostly from the northern States of Bihar and Jharkand, and from Andhra Pradesh joined the first year degree programme. Around 200 students opted for Biotechnology and they were divided into three different groups: Section A, Section B and Section C. Sections A and B each had 55 students and the other section had 90 students.

The researcher had the opportunity to teach *Technical English* to the first two groups of students (Sections A & B) the whole academic year. In the following section the details of the course are given.

1.2 *Technical English* Course

Technical English is a common course for all the first year engineering/technology students of the two engineering colleges – Aarupadai Veedu Institute of Technology, Chennai, and Kirupananda Variaar Engineering College, Salem – constituent colleges of Vinayaka Mission's Research Foundation Deemed University.

The aim of the course is to encourage learners to do participative learning of the English language and help them in acquiring communication skills.

The objectives of the course are:

- To help learners improve their vocabulary and to enable them to use words appropriately in different contexts.
- To familiarize learners with different rhetorical functions of Scientific English.
- To help learners develop key techniques that could be adopted while reading texts.
- To help learners develop listening skills for academic and professional purposes.
- To help learners acquire the ability to speak effectively in English in real life situations.
- To provide practice in realizing the meaning potential of a text and to make the learners become familiar with different reading strategies.
- To help learners acquire interpretative and study skills, including library and Internet reference skills.
- To train learners in organized academic and professional writing.
- To develop aural competence and oral fluency of learners.
- To help learners achieve proficiency in the effective use of language in various authentic career-related situations.

The course consists of five components: Listening, Speaking, Reading, Writing and Language in Use. The duration of the course is 9 months and the total number of teaching hours is 90. The hours allotted for each component are:

1. Listening: 10 hours

2. Speaking: 14 hours

3. Reading : 18 hours

4. Writing 18 hours

5. Language in Use: 30 hours

The prescribed textbooks for the course were:

1. Department of Humanities and Social Sciences, Anna University, English for Engineers and Technologists, Vol.1, Second Edition, Orient Longman Ltd., 2002

2. Department of Humanities and Social Sciences, Anna University, English for Engineers and Technologists, Vol.2, Second Edition, Orient Longman Ltd., 2002

1.3 ESP Teacher's Observation

The students were from six States: Bihar, Jharkand, West Bengal, Orissa, Andhra Pradesh and Tamil Nadu. All the students did not have the same level of proficiency in the English language. An assessment test that was conducted to know their proficiency level in the target language and the analysis of their performance is discussed in Section 3.

According to some of the students the English course was not very challenging. They were of the opinion that it was easy to score good marks without even attending classes. Some other students were of the view that they were not able to follow the course properly because they had very low level of proficiency in English. Due to these factors many students did not attend English classes regularly. This was a demotivating factor for many teachers who teach English at the Institute.

There was another problem with the type of tests and the final exam that were given to students. All the tests and the final exam had only two components: reading and writing. Students' listening and speaking skills were not assessed. Consequently, some teachers also felt that it was not necessary to teach those two important skills. The tests and the exam were not challenging at all. A student could very easily score above 60 marks in the subject but he was not able to express himself orally.

The management wanted the teachers to produce good results. That is, they wanted the teachers to teach in such a way that students can pass the exams. They did not insist on teachers teaching all the four language skills and empowering the students. It has been observed that it is easy for a student to pass in *Technical Englis*h without even acquiring the important language skills such as listening and speaking.

The course materials presented in the textbook are organized around eight topic areas, namely,

resources, energy, computers, transport, technology, communications, environment and industry. Since these topics are not specific to students of biotechnology, most students did not consider it an ESP course that caters to their specific needs and reflects their interests. Since the prescribed book does not deal with themes (topics) related to the field of biotechnology, the researcher felt that it was necessary to provide supplementary materials in order to make the course more interesting and relevant to the students of biotechnology.

As the researcher had freedom to use his own materials in the classroom, he could carry out many innovative experiments in the class. He found the students very friendly, cooperative and open. This was a source of encouragement for him to experiment new ways of teaching the *Technical English* course and think of collaborating with them in the design of *English for Biotechnology* when the suggestion for designing such a course came from the students. (See section 1.5).

1.4 Core Subject Teacher's Feedback

Some teachers who handle the core subjects such as Cell Biology and Biochemistry expressed that most first-year students did not have good communication skills and so they could not follow lectures in English properly and could not take part in academic activities actively. The teachers give different types of assignments to the students and to complete the assignments the students need to have good written and oral communication skills. Those teachers wanted the ESP teacher to improve the students' communication skills. This was a challenge for all the English teachers.

Their informal feedback about the students' language skills made the researcher have a series of interviews with different subject teachers to know their expectations and get their suggestions. The details of the interviews and the analysis of the questionnaires they had filled in are discussed in Chapter Three.

1.5 Evaluation of the Course and the Textbook

Behind every successful ESP course is evaluation. "Evaluation is a whole process which begins with determining what information to gather and ends with bringing about change in current activities or influencing future ones. (Dudley-Evans and St John 1998). Higlighting the importance of evaluation in ESP, they say that "evaluation is a very constructive and powerful activity and a very stimulating one. There is the chance to focus on what has been the most significant contributing factors so that less successful aspects can be modified."

What is the need to evaluate the textbook? Since no published book or set of materials is likely to be perfect and it is the responsibility of the ESP teacher to evaluate the books used on the course. As it was observed that the prescribed textbook did not reflect the learners' needs and interests, it was decided to evaluate the textbook to know its strengths and weaknesses.

It has been mentioned in the previous section that the students' attendance to the English class was thin. Their motivation level was low and that hindered their participation in the learning

activities. Because of these reasons the need to evaluate the textbook arose. The objective was to know the strengths and weaknesses of the book and take necessary steps to enhance the students' motivation level, to make the teaching-learning enjoyable and thus to achieve the course objectives.

What criteria should be followed to evaluate any ESP textbook? "There can be no one model framework for the evaluation of materials; the framework used must be determined by the reasons, objectives and circumstances of the evaluation" (McDonough and Christopher 1993).

It was felt that it was important to evaluate both the course and the textbook used. As the reasons, objectives and circumstances of the evaluation were clear, it was decided to design a questionnaire that would ask students to answer a wide range of questions about the course and the textbook.

The evaluation questionnaire was piloted in the middle of the academic year. By then they had already completed almost forty per cent of the English course.

The students were asked whether they attended English classes regularly and if they had not attended regularly why they had not attended. About 60 per cent of the students were not regular to the English class. The following were some of the reasons:

- Attendance is not compulsory.
- The English course is not very challenging (20 per cent of the students said)
- It is easy to score marks without attending classes regularly.
- Listening and speaking skills are the most important skills, but these skills are not given much importance.

To the question on the usefulness of the course, they gave the following answers:

- It is useful only to a certain extent.
- There is no correlation between what is taught and what is tested in the examination.
- We are not tested in listening and speaking.
- Productive skills, especially speaking skills, are not given importance.

The students did not find all the lessons in the book useful and they had given the following reasons:

- Some lessons were very useful. Those lessons helped us develop our language skills.
- Not a single theme in the book was related to biotechnology. How can the course be called English for Specific Purposes (ESP) if the themes dealt with are not related to our field of specialization?
- Some of the reading texts were not stimulating.
- Some lessons were so easy that they demotivated us.
- Listening material was not available in the form of an audio cassette or compact disc.

Did the book cover all the four language skills: listening, speaking, reading and writing? The

following are the responses from the students.

- Though the four skills are covered, equal importance is not given to all the skills.
- More importance has been given to reading and writing than listening and speaking.
- Listening material is not authentic. .It would be better if the listening material is available in the form of an audio cassette or compact disc.
- Since there are no tests/exams in listening and speaking, students do not realize the importance of these skills.

The question whether the students were satisfied with the textbook received mixed reaction from the respondents.

- Though the textbook is not perfect, it is good to use the book for one semester.
- It is better to have a different book which has at least one or two units that deal with biotechnology.
- The textbook does not reflect the students' needs and interests.

Most students were not happy with the continuous internal assessment pattern that was followed in the college. They suggested the following changes in the assessment pattern.

- Any English test should have the four components: listening, speaking, reading and writing.

The following suggestions were given by the respondents to improve the *Technical English* course.

- The teacher should provide supplementary materials.
- The teacher should find out the students' present and future needs and accordingly design a course.
- A supplementary course English for Biotechnology should be designed to bridge the gap.
- The students should be involved in the design of such a course.

In summary, the analysis of the students' responses revealed that most students were not happy with the content of the books as out of the eight themes not a single theme was related to the field of biotechnology and they wanted the introduction of a supplementary ESP course *English for biotechnology*. They also wanted the course to be designed with their collaboration based on their immediate and future language needs.

Besides revealing the learners' assessment of the English course and the book used, the analysis of the evaluation questionnaire revealed interesting information about the learners ' likes and dislikes with regard to course materials and their learning styles. These are discussed in detail in Section 3.

1.6 The Need for Developing a Supplementary Course

ESP practitioners often have to plan the course that they teach and provide the materials for it. It is rarely possible to use a particular textbook without the need for supplementary material, and

sometimes no really suitable published material exists for certain of the identified needs. The role of ESP teachers as providers of material thus involves choosing suitable published material, adapting material when published material is not suitable, or even writing material where nothing suitable exists. (Dudley-Evans and St John 1999).

The analysis of the evaluation questionnaire, as discussed in the previous section, also revealed the desire of students to have a supplementary course designed. The researcher as the ESP teacher also felt the need to design such a course.

How the learners' target needs were determined, the conception of the idea of learner participation in the course design, the nurturing of the idea, the setting of course objectives, the selection and production of course materials, the delivery of the course and the final evaluation to know its effectiveness on the learner are discussed in detail in Section Three.

2. LITERATURE REVIEW

2.1 English for Specific Purposes (ESP)

English for Specific/Special Purposes (ESP) and General English (GE) are the two branches of English Language Teaching (ELT).

General English and English for Specific Purposes share the same principles of language teaching, having effective and efficient learning as a main objective. The main difference between ESP and GE lies in the *awareness of a need.* ESP learners are current or future specialists who need English for their specific area and who are aware of their need; they know what exactly they need English for, they know what the ESP course should offer them. (Hutchinson and Waters 1987 as cited in Nitu 2002).

According to Hutchinson and Waters (1987), ESP is an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning.

2.1.1 Absolute and Variable Characteristics of ESP

Strevens (1988 as cited in Gatehouse 2001) defines the absolute characteristics of ESP as being:

- designed to meet the needs of the learner;
- related in content (i.e., in its themes and topics) to particular disciplines, occupations and activities;
- centered on the language appropriate to those activities in syntax, lexis, discourse, semantics, etc., and analysis of the discourse;
- in contrast with General English.

Later Dudley-Evans and St John (1998 as cited in Gatehouse 2001) modified Strevens' definition and offered a definition of the variable characteristics of ESP.

- ESP may be related to or designed for specific disciplines;
- ESP may use, in specific teaching situations, a different methodology from that of general English;
- ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation. It could, however, be for learners at secondary school level;
- ESP is generally designed for intermediate or advanced students;

As noted by Gatehouse (2001), Dudley-Evans and St. John have removed the absolute characteristic that 'ESP is in contrast with General English' and added more variable characteristics. They assert that ESP is not necessarily related to a specific discipline. Furthermore, ESP is likely to be used with adult learners although it could be used with young adults in a secondary school setting.

As for a broader definition of ESP, Hutchinson and Waters (1987) theorize, "ESP is an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning". Anthony (1997) notes that, it is not clear where ESP courses end and general English courses begin; numerous non-specialist ESL instructors use an ESP approach in that their syllabi are based on analysis of learner needs and their own personal specialist knowledge of using English for real communication.

2.1.2 Classification of ESP

ESP has traditionally been divided into two main areas: English for Academic Purposes (EAP) and English for Occupational Purposes (EOP).

Dudley-Evans and St John (1998) divide ESP into English for Academic Purposes (EAP) and English for Occupational Purposes (EOP). Two categories of EOP courses are often identified as English for Professional Purposes (EPP) and English for Vocational Purposes (EVP). The EPP includes English for Medical Purposes (EMP) and English for Business Purposes (EBP). The EVP includes Pre-Vocational English (PVE) and Vocational English (VE).

David Carter (1983 as cited in Gatehouse 2001) identifies three types of ESP:

- English as a restricted language
- English for Academic and Occupational Purposes
- English with specific topics.

In the 'Tree of ELT' (Hutchinson & Waters, 1987), ESP is broken down into three branches: a) English for Science and Technology (EST), b) English for Business and Economics (EBE), and c) English for Social Studies (ESS). Each of these subject areas is further divided into two branches: English for Academic Purposes (EAP) and English for Occupational Purposes (EOP). An example of EOP for the EST branch is 'English for Technicians' whereas an example of EAP for the EST branch is 'English for Medical Studies'.

Hutchinson and Waters (1987) do note that there is not a clear-cut distinction between EAP and

EOP: "people can work and study simultaneously; it is also likely that in many cases the language learnt for immediate use in a study environment will be used later when the student takes up, or returns to a job". Perhaps, this explains Carter's rationale for categorizing EAP and EOP under the same type of ESP. It appears that Carter is implying that the end purpose of both EAP and EOP is the same: employment. However, despite the end purpose being identical, the means taken to achieve the end is very different indeed. I contend that EAP and EOP are different in terms of focus on Cummins' (1979) notions of cognitive academic proficiency versus basic interpersonal skills. This is examined in further detail below.

The third and final type of ESP is English with specific topics. Carter notes that it is only here where emphasis shifts from purpose to topic. This type of ESP is uniquely concerned with anticipated future English needs of, for example, scientists requiring English for postgraduate reading studies, attending conferences or working in foreign institutions. However, Gatehouse (2001) argues that this is not a separate type of ESP. Rather it is an integral component of ESP courses or programs which focus on situational language. This situational language has been determined based on the interpretation of results from needs analysis of authentic language used in target workplace settings.

2.1.3 Characteristics of ESP Courses

According to Carter (1983 as cited in Gatehouse 2001) are discussed here. He states that there are three features common to ESP courses:

a) authentic material,

b) purpose-related orientation, and

c) self-direction.

Here are some definitions of authenticity of text or teaching materials:

An authentic text is a stretch of real language, produced by a real speaker or writer for a real audience and designed to convey a real message of some sort. (Morrow, 1977, p. 13)

Authentic texts (either written or spoken) are those which are designed for native speakers: they are real texts designed not for language students, but for the speakers of the language in question. (Harmer, 1983, p. 146)

A rule of thumb for authentic here is any material which has not been specifically produced for the purposes of language teaching. (Nunan, 1989, p. 54)

A recent trend in language teaching and learning has been the growing concern with authentic texts (Lynch 1982). Authentic texts are widely used by all ESP course designers as they have proved to be effective teaching-learning materials.

Purpose-related orientation refers to the simulation of communicative tasks required of the target

setting. Carter (1983) cites student simulation of a conference, involving the preparation of papers, reading, notetaking, and writing.

Finally, self-direction is characteristic of ESP courses in that the " ... point of including self-direction ... is that ESP is concerned with turning learners into users" (Carter, 1983, as cited in Gatehouse 2001). In order for self-direction to occur, the learners must have a certain degree of freedom to decide when, what, and how they will study.

2.1.4 ESP Practitioner

The role of the ESP teacher differs from those of the General English teacher. With some reasonable justifications, Swales (1985) prefers to use the term "ESP practitioners" instead of "ESP teachers" to reflect this specific scope. Several researchers regard ESP teaching as extremely varied, and for this reason they use the term "practitioners" rather than "teachers" to emphasize that ESP teaching involves much more than writing. According to Dudley-Evans and St John (1998), the ESP practitioner has five key roles:

- Teacher
- Course designer and materials provider
- Collaborator
- Researcher
- Evaluator

2.2 Collaborative Approach to ESP Course Design

Dudley-Evans and St John (1998) suggest three levels of cooperation: *Cooperation, Collaboration and Team-Teaching*.

Cooperation here means "the language teacher taking the initiative in asking questions and gathering information about the students' subject course, how English fits into their course and what the department and students see as priorities."

"In collaboration the language and subject teacher work together outside the classroom."

Team teaching refers to "the actual working together in the classroom of the subject and language specialists."

The researcher involved the core subject teachers and the students in the design of the *English for Biotechnology* course. The next chapter discusses in detail how the subject teachers and students collaborated with the ESP teacher in the design of the supplementary course.

3. ENGLISH FOR BIOTECHNOLOGY: THE DESIGN

3.1 Introduction

How does an English for Specific Purposes (ESP) practitioner react when the learners of an ESP course tell him/her that the prescribed textbook does not satisfy their needs, what their immediate and future language needs are, what and how they should be taught, how the supplementary ESP course should be designed, how they should be involved in the design of they course, what role the teacher should play and how they would like to learn. Should the ESP practitioner take the learners' suggestions/demands as a challenge and plunge into action or ignore the suggestion of the learners as something impracticable and take refuge in a course book that already exists?

The researcher encountered such a challenging situation when he was engaged in teaching the *Technical English* course to the students of biotechnology. The background has already been discussed in Chapter One. The challenge made him raise a few key questions:

- Is it the sole responsibility of the ESP teacher to design an ESP course?
- Are learners potential ESP course designers?
- If learners are given an opportunity to participate in the design of an ESP course, will the outcome of the course be effective?

- In what ways can learners contribute to the design of the course?
- What criteria should be followed for designing such a course?
- What are the strengths and limitations of this particular group of learners as collaborative course designers?
- What is the role of the ESP practitioner?

Dudley Evans and St. John (1998) state that the ESP practitioner should play five important roles: teacher, course designer and materials provider, collaborator, researcher and evaluator.

Though some ESP teachers have been effective course designers and materials providers, there is not much evidence to prove whether learners have been involved in the design of ESP courses by selecting course materials and suggesting tasks.

The researcher is of the view that his students are potential selectors and providers of appropriate reading and listening materials for the proposed supplementary course *English for Biotechnology* based on the proof that they could critically evaluate or review the *Technical English* course and the textbook. It was further strengthened by the fact that the learners are more knowledgeable in the field of biotechnology than many ESP teachers. Dudley Evans and St John (1998) state that "teaching ESP is different from teaching EFL because learners have knowledge that they need to use, which we, the ESP teachers, generally do not have." The learners' enthusiasm and cooperation made the researcher carry out the experiment of involving the learners in the design of the course.

The various stages of the design of the course are discussed in the following sections:

1. Needs analysis
2. Setting course objectives
3. Selection of course materials

4. Teaching Methodology

3.2 Needs Analysis

One of the hallmarks of English for Specific Purposes (ESP) was that English Language Teaching (ELT) should be learner-centred, i.e., it should respond to the language needs of the learner. In this view each language-learning situation is unique and should be thoroughly studied and delineated as a prerequisite for the design of language courses.

With the spread of communicative language teaching (CLT), much emphasis in second language (L2) methodology has been paid to the learner-oriented instruction. As a result, needs analysis has been given considerable attention in making a particular course serve a particular group's interests (Graves K., 1996; Harrison R., 1996; Hutchison T. & A. Waters, 1987; Vorobieva N., 1996 as cited in Sysoyev P. 2000).

Needs analysis is a process of establishing the what and how of a course. The needs analysis as put forth by Dudley Evans and Maggie Jo (1998) encompasses a detailed description of learners' needs: the tasks and activities the learners are/ will be using English for, personal information about learners, cultural information about the students, their current language skills, their perceived language needs, etc.

In order to collect information and data about the learners' proficiency in the English language, their immediate and future target needs and to know the subject teachers' expectations and to get their suggestions, the following steps were taken:

- Giving a pre-course assessment test to students
- Giving orientation to students on ESP
- Interviewing subject experts
- Assessing students' needs

The main data collection methods for such needs assessment were questionnaires, structured interviews, discussions, analysis of spoken and written tests and observations.

3.2.1 Pre-Course Assessment Test

The main aim of giving a pre-course assessment test to the students was to know their proficiency level in English and to analyze their strengths and weaknesses in different language skills. The test consisted of five parts: Structure, Error Identification, Reading, Writing, Listening and Speaking.

Part 1: Structure

Part 1 consisted of 10 questions. There were ten incomplete sentences. Beneath each sentence

there were four words or phrases, marked A, B, C, and D. The students were required to choose the one word or phrase that best completes the sentence. The rationale for giving this component of the test was to assess students' ability to recognize grammatically correct English.

Part 2: Error Identification

Part 2 consisted of 5 questions. Each sentence had four underlined words or phrases. The four underlined parts of the sentence were marked A, B, C, and D. The students were required to identify the one underlined word or phrase that must be changed in order for the sentence to be correct. The rationale for giving this component of the test was to assess students' grammatical knowledge.

Part 3: Reading

Part 3 consisted of a reading passage and ten multiple choice questions. The students were required to choose the one best answer A, B, C, or D to each question. The rationale for giving this component of the test was to assess students' ability to understand written English.

Part 4: Writing

The students were asked to write an essay on the following topic. "*Some people argue that vast sums of money should be spent on biotechnology research. Others argue that biotech research should not be on the priority list. Tell which position you agree with and why*." The rationale for giving this component of the test was to assess students 'ability to produce correct and meaningful English.

Part 5: Listening

The students were asked to listen to a tape (news report) and respond to various types of questions. The rationale for giving this component of the test was to assess students 'ability to understand spoken English.

Part 6: Speaking

The students were asked to speak about any topic for 3 minutes. The rationale for giving this component of the test was to assess their ability to speak in English.

Analysis of the Test Results

The analysis of the results of the pre-course test was instrumental in assessing students' strengths and weaknesses in various language skills.

- All students did not have the same level of proficiency.

- About 30 percent of the students had acceptable command of the English language. They could write and speak intelligibly and in an effective way. They used good cohesive and organizational devices both in their speaking and writing.
- Some students were good at speaking but had problems in expressing themselves in writing. They could not present their arguments coherently. Their essays lacked organizational devices.
- About 30 percent of them could write intelligibly but were not able to express themselves because of lack of confidence.
- Almost 50 per cent of the students had problems with communicating effectively. The reasons for the ineffective communication are: limited vocabulary, lack of confidence, inaccurate expressions and restricted fluency.
- About 20 percent of the students had problems with speaking and writing.
- The analysis of students' essays revealed that about 40 percent of the students lacked clarity of thought and clarity of expression. The essays written by them were difficult to follow. Their essays lacked structural, grammatical and punctuation accuracy. Grammatical errors interfered with comprehension of what they had written.
- In some of the essays the arguments were either not presented well or not developed properly.

- Most students had used simple structures in their essays and some of those who had attempted to produce more complex sentences demonstrated their inability to do so. They were not successful in using appropriate connectives.

- Almost 40 percent of the students had problems with expression and the appropriate choice of words. Their use of complexity and variation in sentences were limited.
- Most students had failed in the listening component of the test. It showed they did not have sufficient practice in listening.

3.2.2 Orientation on ESP

While giving introduction to the course *Technical English* the ESP practitioner explained to the students what ESP is, how it developed, how it is defined, how it is classified and how it is different from General English.

To help them understand better they were also asked to read an article about English for Science and Technology (EST).

The criteria for evaluating ESP course materials were given in the form of a checklist and the students were asked to evaluate the textbook *English for Engineers and Technologists.*

The orientation sessions helped the students gain knowledge about ESP and get training in evaluating materials. Later it also served as a basis for them to select appropriate reading and listening materials for the supplementary course and collaborate with the ESP teacher in the course design.

3.2.3 Subject Teachers' Expectations and Suggestions

As discussed in the previous chapter, it is important to get support from subject experts when the language teacher is engaged to design a subject-specific ESP course. The staff of the department of biochemistry at the Institute were asked to give a list of learners' immediate and future language needs and were asked to suggest what content should go into the proposed supplementary course to be designed. Besides a series of interviews with the subject teachers, questionnaires were also given to them.

The subject teachers showed interest in the project and cooperated with the researcher by explaining the students' problems with the target language and suggesting remedies. The teachers give different types of assignments to students. The types of assignments include summarizing a text, preparing an essay on a topic by referring to books, defining technical terms, explaining a concept, analyzing an issue and writing a report, etc. Most students lack writing skills and so they do not write any assignment on their own. They just reproduce from books available.

Students are required to attempt different types of questions in continuous assessment tests and exams. The following are samples of different types of questions:

- *Define* -------
- *Give the characteristics of* ----------
- *List the drawbacks of* ----------
- *State the law of* ----------
- *Explain* ----------
- *Compare and contrast*----------

The students need to have good writing skills in order to excel in such tests and exams. Most students cannot write on their own because their proficiency level in the target language is very low. They memorize answers and reproduce them in tests and exams because of the aforementioned problem.

Listening and speaking are two important skills for the students in order to follow lectures, to interact with the teachers and fellow students, to take part in group discussions and to give oral presentations. According to the teachers, almost 40 percent of the students lack competence in these skills.

In summary the following were the problems stated by the teachers:

- Some students find it difficult to follow lectures in English.
- They do not know how to take notes.

- About 40 per cent of students have problems with speaking and writing in English.

- Since they do not have good writing skills, they do not write assignments on their own.

- Those students who cannot speak fluently do not take part in activities which require them to speak in the target language.

- Most students lack technical writing skills.

The following suggestions were given:

- Remedial coaching in English should be given to the disadvantaged students in order to enhance their level of motivation and participation.

- The students should be exposed to reading texts related to biotechnology and they should be trained to analyze the texts critically though they are scientific in nature.

- Technical writing should be given more importance.

- The language teacher should correct students' writing assignments and help the students attain grammatical accuracy.

- More opportunities should be given to the students to speak in English in the class.

- The students should be given practice in making oral presentations.

- The subject teachers should be involved in selecting reading texts for the proposed supplementary course.

The suggestions given by the teachers helped the researcher give a focus to his research. Any subject-specific ESP course will be effective and prove to be fruitful for the end user (the learner) if the ESP course designer involves teachers who teach core subjects at various stages of the course design.

3.2.4 Pre-Course Needs Assessment

According to Dudley-Evans and St John (1998), "the key stages in ESP are needs analysis, course (and syllabus) design, materials selection (and production), teaching and learning, and evaluation".

Information and data concerning what and how the students want to learn, how they want to involve themselves in the course design, etc, were collected by administering needs assessment questionnaires.

The needs analysis questionnaire helped the researcher gain an insight into the students' present and future language/communication needs, what language skills they need to develop, how the students want to involve themselves in the course design, what teaching methodology the ESP

teacher should follow, how they would like to contribute to the success of the course, how they would like to be assessed at the end of the course, etc.

The learners had mentioned the following skills as their immediate language needs:

- attending seminars and listening to lectures (listening skills),
- reading texts related to biotechnology (reading skills),
- taking part in group discussions, giving seminars / presentations (speaking skills)
- defining technical terms, writing assignments based on the functions such as describing, defining, discussing, analyzing, comparing and contrasting, enumerating, evaluating, illustrating, summarizing (technical writing).

Similar language skills (communication skills) listed above have been highlighted in the report by the American Society for Engineering Education as important skills for engineering careers. Manivannan in his *Technical Writing and Communication: What & Why*, (www.usingenglish.com/articles/technical-writing.html) gives the example of the American Society for Engineering Education which conducted a survey to determine which academic skills are most needed for engineering careers in industry. The results show that communication skills rank above any other type of skill, capturing five of the most-needed skills, out of thirty-eight skills analyzed. These five communication skills are:

- Technical writing (2nd place)
- Public speaking (4th place)
- Working with individuals (6th place)
- Working with groups (7th place) and
- Talking with people (9th place)

The students wanted the course to be planned for 40 hours. It was explained to the students that a 40-hour supplementary course was practically not possible. Then it was decided to have a 30-hour course.

Most students expressed their interest in involving themselves in selecting course materials and even suggesting tasks and activities based on the theme and topics covered.

By negotiating with the learners a team consisting of the teacher and twelve student representatives was formed. Analyzing the responses to the questions asked in the needs analysis questionnaire, the team set the objectives and specified the role of the teacher and learners in the course design.

3.3 Course Objectives

Formulating goals and objectives for a particular course allows the teacher to create a clear

picture of what the course is going to be about. As K. Graves (1996 as cited in Sysoyev, P. 2000) explains, goals are general statements or the final destination, the level students will need to achieve. Objectives express certain ways of achieving the goals. In other words, objectives are teachable chunks, which in their accumulation form the essence of the course. Clear understanding of goals and objectives will help teachers to be sure what material to teach, and when and how it should be taught.

The course objectives, according to Ellis and Johnson, are "the goals of a course in English, as indicated by the needs analysis, and expressed in terms of what the learner should be able to do" (p221).

The goal was to enable students to make the transition from *English for Engineers and Technologists* (common course) to *English for Biotechnologists* (more specific) environment by providing them with scientific English through content-cum-task based teaching-learning materials and through the integration of the four major language skills: listening, speaking, reading and writing.

The following specific objectives were set based on the needs of the students:

1. to develop the learners' reading skills to ensure comprehension of biotechnology related reading materials;
2. to develop the learners' technical writing skills with the focus on defining technical terms, essay writing, and summary writing;
3. to enable the learners to acquire speaking and presentation skills;
4. to develop the learners' listening comprehension skills;
5. to develop learner autonomy;
6. to develop the learners' critical thinking skills through various tasks;
7. to develop their interpersonal skills through various group activities;

3.4 Selection of Materials

Materials play an important role in the design of any language course. If students do not find the materials interesting and the teaching methodology creative, they lose their motivation. It is the role of the teacher to set the track right for the learners by creating an environment that is conducive for learning. This has been articulated in Dulay, Burnt, and Krashen (1982).

"Learning a second language can be exciting and productive….or painful or useless. One's efforts can end in the acquisition of native-like fluency or a stumbling repertoire of sentences soon forgotten…The difference often lies in how one goes about learning the new language and how a teacher goes about teaching it. To be successful, a learner need not have a special inborn talent for learning language. Learners and teachers simply need to "do it right" "(p-3).

Most learners had expressed that the reading materials in the prescribed book were not relevant to the students of biotechnology. To the question on how they would like to involve themselves in the design of the course, the learners had stated that they would select appropriate authentic

reading materials. The process of selecting and producing materials took about three weeks.

Initially the learners were briefed about the importance of authentic materials. Schleicher (1999) defines authentic materials as "oral and written texts that occur naturally in the target language environment and that have not been created or edited expressly for language learners". What are the advantages of using authentic materials? According to Swaffer (1998) there are many advantages of using authentic texts in the classroom:

1. learning is enhanced by the use of texts of particular interest to a class
2. there will be an increase in variety and spontaneity in classes that introduce authentic materials
3. exposure to a variety of vocabulary and structures will occur
4. students will capitalize on their prior cultural and schematic knowledge to contrast target situations and genres with those of their own culture (p.18).

As part of the first assignment each student was given the task of selecting his / her own reading texts from sources such as newspapers, magazines, journals, books and the Internet and were also asked to give his / her reasons for selecting the reading material. The response to the assignment was very positive.

The following were some of the topics submitted by the learners: Eugenics, Biodiesel, Nanotechnology in biotechnology, The future of cloning, Genetic engineering, Human genome project, Biofuels, Anti-cancer drugs, and Vaccine through biotechnology. The reasons given by them can be summarized as follows:

- The reading material is related to the field of biotechnology.
- The article is a very interesting piece and motivates us to read.
- The selected reading material is an authentic text.
- The reading text contains many technical words.
- The reading passage has optimal word length.
- It is a very interesting topic for group discussion and for writing essays.
- The language is not too technical.
- If the reading material is properly exploited, many tasks can be devised.

The second assignment was done in groups of six members. Each group was given six reading texts and was asked to select the best two based on the aforementioned reasons given by the learners for selecting their texts. They were also asked to list as many technical words as possible from the selected texts and write their definitions. The other task given to them was to write two discussion questions for each selected text. The response to the second assignment was very encouraging as the learners were told that the assignment would be considered for their internal marks.

A careful analysis of the materials selected by the learners showed that learners can be trained and used effectively in materials modification and development. Though not all, about 70 per cent of the texts selected by different groups were appropriate, authentic, rich in content and

vocabulary and stimulating. The tasks devised by the groups needed only slight modifications.

The reading texts selected by individuals but not shortlisted by groups were not rejected. The students were asked to prepare an oral presentation based on the same topic. This further enhanced their interest and motivation in the course.

According to Ghani, S. (1995), developing an ESP reading course for ESL students is a challenging task. He lists four major problems the material designer faces:

1. deciding on the purpose of the reading in order to determine the level of reading difficulty.
2. deciding on the cognitive level of comprehension.
3. selecting reading texts with the right level of difficulty for both students and teachers.
4. deciding on the appropriate length of the text.

The researcher too faced the same problems. He was not happy with some of the texts selected by the students as they were either too technical or too long. He had to ask them to explain their rationale for selecting such texts and later asked them to choose some other better texts.

3.4.1 Course Structure

The course designed had 5 units and each unit had two or three reading texts. All the four major language skills are taught in an integrated manner. The activities / tasks were of three types: i) Pre-reading, ii) While-reading and iii) Post-reading. As it is not practically possible to cover all the sub-skills that the learners considered important in the limited time, only some skills were prioritized and covered in the supplementary course: reading technical texts, technical writing (definition of technical terms, summary, and essay), oral presentation skills and listening skills.

Title	English for Biotechnology
Nature	Supplementary to the main course
Duration	30 hours
Period	2 months
Total number of units	5
Number of hours required to cover the five units	5x4=20 hours
Number of hours required for students' oral presentation	10 hours

An intermediate level of proficiency level is required for students to successfully complete the course. Those students whose proficiency level in the English language is low were advised to have some remedial coaching before doing the supplementary course.

3.4.2 Skills: Tasks and Activities

All the four language skills are taught in an integrated manner. Students are tested on their

reading, listening, speaking and writing skills. They are also tested on their knowledge of grammatical structure and usage in the context of a reading text. Each unit consists of the following seven sections:

1. Getting started
2. Reading
3. Writing
4. Listening
5. Speaking
6. English in use
7. WWW-based activity

The tasks are arranged around the themes dealt with in the five units of the course. The sections given below explain the rationale for introducing certain tasks and the benefits of using them in the supplementary course.

Getting started

The getting started section contains many warm-up exercises such as brainstorming, pair work and puzzles. It tests students' pre-knowledge in the theme/topic dealt with in the unit and prepares them to understand the topic better and perform well.

Reading

Reading texts are authentic texts, selected based on certain criteria: content, technical vocabulary, grammatical structures and complex language, which are suitable to students at the undergraduate level.

The objectives of teaching reading skills are as follows:

1. To make students read a range of biotechnology related texts in class.
2. To enable them to interact with reading texts by focusing on pre-reading questions.
3. To stimulate their interest in the topics dealt with.
4. To train them in prediction techniques.
5. To give them practice in skimming and scanning.
6. To make them use different reading strategies by asking them to attempt answering different types of questions.
7. To make them get into the habit of analyzing texts.
8. To develop their critical thinking skills.

The following are different types of tasks:

- Sequencing jumbled sentences

- Reading comprehension questions to test their skimming and scanning skills.

- Cloze
- Vocabulary exercises
- Crossword puzzles

Writing

The following are the objectives of teaching writing:

- To give students practice in writing tasks.
- To help them link ideas properly.
- To give them practice in using a variety of sentence structures and complex language appropriate to the task.
- To improve their technical communication skills.

The following are different types of tasks:

1. Technical definition
2. Report
3. Paragraph / Essay
4. Letters

Students are taught to follow the process approach to writing which requires the following sequence:

1. Prewriting

- Determining objectives
- Gathering data
- Considering audience

2. Writing

- Organizing the draft
- Formatting the content

3. Rewriting

- Revising

- Editing

Listening

Language learning depends on listening. A good speaker is a good listener. Listening provides the aural input that serves as the basis for language acquisition and enables learners to interact in spoken communication. Listening strategies are techniques or activities that contribute directly to the comprehension and recall of listening input. Given below are some of the strategies that the students were taught to master on the course.

- listening for the main idea
- predicting
- drawing inferences
- summarizing
- listening for specific details

VOA Special English listening material was used on the course. The reasons for using the material are:

The goal of Voice of America's Special English program is to communicate by radio in clear and simple English with people whose native language is not English. Three elements make Special English unique. It has a core vocabulary of 1500 words. Most are simple words that describe objects, actions or emotions. Some words are more difficult and they are used for reporting world events and describing discoveries in medicine and science. Special English broadcasters read at a slower pace, about two-thirds the speed of standard English. This helps people learning English hear each word clearly. It also helps people who are fluent English speakers understand complex subjects.

Another important reason for using VOA Special English listening material is that through the years, Special English has become a very popular tool for teaching English, although it was not designed as a teaching program. People around the world practice their listening and speaking skills by recording the programs and playing them repeatedly. Internet users can also listen to programs on the Special English Web site while reading the text.

The task is that students listen to a news report from their area of specialization and answer comprehension question and write a summary of the report.

Speaking

Almost all the students expressed their need to improve their speaking skills. The following are the speaking activities:

- Group Discussions

- Role-plays
- Brainstorming
- Interviews
- Oral Presentation

The reasons for including these activities in the speaking session are given below:

Discussions

After a content-based lesson, a discussion is held for various reasons. The students may aim to arrive at a conclusion, share ideas about an event, or find solutions in their discussion groups. This activity fosters critical thinking and quick decision making, and students learn how to express and justify themselves in polite ways while disagreeing with the others. In class or group discussions the students learn how to ask questions, paraphrase ideas, express support, check for clarification, and so on.

Role Play

In role play situations, students pretend they are in various social contexts and have a variety of s roles. This exercise helps them gain an insight into different roles of people in their fields and also helps them gain confidence.

Oral Presentation

Making an oral presentation on a biotechnology-related topic is an important component of the course. The details of this component are discussed in Chapter Four.

Use of English

The main objective of this section is to help students learn and use grammar in context. The different types of exercises included in this section reflect the students' interests. The following are the types of tasks:

1. Cloze
2. Error correction
3. Word formation
4. Crossword puzzle

The details of each task type are given below:

Cloze

A text is given and it has 15 gaps. Each gap represents a missing word or phrase. The text is followed by 15 words or phrases. Students have to choose the word or phrase that best fits the gap. Different types of words are tested in this task.

Error Correction

The text contains errors typically made by students at the undergraduate level, e.g. incorrect verb forms, wrong pronouns, prepositions and articles. The students must detect the errors and correct them. If there are any additional words, they must delete them and if there are any words missing, they must supply the missing words. Tasks of this type help students acquire grammatical competence in context.

Word Formation

The text contains some gaps. At the end of each gap a word in parentheses is given. Students have to produce a new word based on this word which can be correctly inserted in the gap.

Crossword Puzzle

The crossword has long been a favourite puzzle for everyone. This programme helps students learn new sets of words. Definitions are given and students should use the clues and guess the correct word for each definition.

3.4.3 Course Outline

Unit 1

Theme: **Biotechnology, the Technology of the Twenty-First Century**

Getting started:

i) Speaking: Pair work

ii) Vocabulary: ‘Bio-‘ words

Reading:

Text 1: What is Biotechnology?

Text 2: Biotechnology – A Collection of Technologies

Text 3: The Future of Biotechnology

Writing:

i) Summary,

ii) Extended Definition

Listening:

VOA Special English Agriculture Report: As Biotech Crops Increase, E.U. is Found to Stand in the Way

Speaking: Group Discussion

English in use:

i) Crossword (Biotech Terms)

ii) Text Cohesion –Sequencing

iii) Cloze

iv) Editing

v) WWW-based activity: Blog

Unit 2

Theme: **Genetically Modified (GM) Food**

Getting Started:

i) Discussion – Pair work

ii) Writing - Definition

Reading:

Text 1: Genetically Modified Foods

Text 2: Genetically Modified Crops in India

Writing:

i) Essay (Listing)

ii) Technical Definition

iii) Essay (Argumentative)

Listening:

VOA Special English Agriculture Report: *Going Biotech - A Spanish*

Farmer Discusses His Experience

i) Comprehension

ii) Note-making and Summary

Speaking:

i) Debate

ii) Role play

English in Use:

i) Affixes: Prefixes and Suffixes

ii) Word Formation

iii) Crossword (Genetic Terms)

iv) Text Cohesion: Sequencing sentences

WWW-based activity: Blog

Unit 3

Theme: **Cloning**

Getting Started:

i) Class discussion

ii) Writing

Reading:

Text 1: Snuppy, the cloned dog

Text 2: Transgenic Animals

Text 3: Professor Mario's Speech

Writing:

i) Flowchart

ii) Interview questions

iii) Essay

Listening: VOA Special English News Report: Progress Made in Stem Cell Research

i) Comprehension

ii) Note-making and Summary

Speaking:

i) Role-play

English in Use:

i) Matching (Cloning Terms)

ii) Cloze

iii) Text Cohesion

iv) Editing

v) Grammar in Context (Passive Voice)

WWW-based activity: Blog: Pros and Cons of Cloning Animals

Unit 4

Theme: **Biometrics**

Getting Started:

i) Speaking: Classroom Discussion

ii) Puzzle

Reading:

i) Text 1: Biometrics

ii) Text 2: The Chips are Coming

Writing:

i) Essay

ii) Letters to the Editor

Listening: A Drug to Protect Against Bird Flu Succeeds in First Tests

i) Comprehension

ii) Note-making: Summary

Speaking:

i) Group Discussion

ii) Role-play

English in Use:

i) Crossword Puzzle

ii) Cloze

iii) Text Cohesion: Sequencing

iv) Editing

v) Grammar in Context

WWW-based activity: Blog:

Unit 5

Theme: **Bioethics**

Getting Started:

i) Speaking: Classroom Discussion

ii) Puzzle

Reading:

i) Text 1: Ethical Issues of Human Genome Project

ii) Text 2: Ethical Issues of Cloning

Writing:

i) Report

ii) Essay

Listening: Scientists Clone Pigs to Make Omega-3 Fatty Acids

i) Comprehension

ii) Note-making: Summary

Speaking

i) Group Discussion

ii) Role-play

English in Use:

i) Crossword Puzzle

ii) Cloze

iii) Text Cohesion: Sequencing

iv) Editing

v) Grammar in Context

WWW-based activity: Blog

3.5 Teaching Methodology

The learners wanted the ESP teacher to play the role of a facilitator while teaching the course. According to Nitu (2002), the *communicative approach* to teaching seems to be not only a modern method, but also the most appropriate teaching theory for an ESP course.

The ESP teacher is aware that he is a language specialist and not a subject (Biotechnology) expert. The teacher facilitates learning by encouraging students to actively participate in various language activities, such as role-play, group discussion and class discussion.

The teacher helps students develop their critical thinking skills. How the course was delivered and what the students benefited from the course and the challenges faced by the ESP teacher are discussed in the next section.

4. EVALUATION AND SUGGESTIONS

4.1 Course Delivery: Teaching-Learning

The teaching-learning process started much earlier than the actual course content that was delivered to the students in a formal manner.

The students started learning new things related to *English for Biotechnology* at a stage when it was decided to design the supplementary course and the ESP teacher asked each student to select and submit a reading passage related to the field of biotechnology. They could acquire knowledge and develop their language skills at various stages during the process of designing and the delivery of the course.

First, the students were asked to give their reasons for selecting a particular text and list all the technical terms and the meanings / definitions of the words. Then at a later stage the students were grouped and were asked to select two out of the 6-8 reading texts, give their reasons for selecting the texts, list the technical terms and find out the meanings/definitions, and write two discussion questions. Each group leader was asked to present the report of group dynamics to the whole class.

During the process they could go through many technical texts, discussed the relevance of such texts with their fellow classmates, gave their reasons for selecting or not selecting certain reading passages, referred to dictionaries to find out the meanings/definitions of technical term, suggested discussion topics and wrote and presented the reports to the class. The whole process helped them become familiar with technical texts, develop their interpersonal and communication skills and to have a good beginning.

The second stage was delivering the course content and achieving the course objectives. The effectiveness of the second stage depended both on the ESP teacher and the learners.

The teaching-learning materials required the ESP teacher and the students to play an active role in the process of the course delivery. The teacher was a facilitator and the students were active participants.

4.1.1 Teacher as a Facilitator

When the ESP teacher actually started teaching the course, he found it enjoyable and at the same time challenging. His role was to develop the four language skills through various tasks and activities, promote learning and foster critical thinking in the students. In order to play the role effectively he had to use a different approach to teach each skill.

The students did the reading tasks by themselves and later the answers were checked in the class. There was much interaction and discussion and the teacher encouraged it.

The teacher spent more time on teaching writing. The students were taught the process approach to writing. Before attempting any writing task, the students were asked to prewrite, write and rewrite the draft. This process approach to writing helped the students improve their writing skills.

During the group discussion activity the teacher joined some groups and mingled with the students. This was a source of inspiration for some students.

Due to time constraint the ESP teacher could complete only three units and only 29 students could make oral presentations. Students' feedback on each section of the unit was collected after completing a particular unit. This helped both the ESP teacher and the learners: the ESP teacher could modify the programme as per the suggestions given by the students or change his teaching methodology and the learners could participate more actively and contribute in a better way to the success of the programme.

4.1.2 Learner Participation

Students started attending English classes regularly and participated in carrying out activities and tasks enthusiastically. Since most students were familiar with the topics dealt with, their participation in class and group discussions and role-plays was better than was expected.

Giving an oral presentation on a biotech-related topic by each student was one of the requirements of the course. The suggestion for developing the students' presentation skill emanated from the subject experts and the students themselves.

Each student was asked to select a topic related to the field and give an oral presentation for 6-7 minutes. The checklist below summarizes how the students were asked to prepare themselves for the oral presentation:

CHECKLIST FOR ORAL PRESENTATION

1. Have you selected a topic?

- Is the topic related to biotechnology?
- Is it an interesting topic?
- Do you have supporting materials?
- Is it easy to understand?
- Will your classmates be interested in the topic?

2. Have you prepared a list of reasons for having selected the topic and supporting materials?

3. Has your ESP teacher approved your topic?

4. Have you prepared an outline?

- Does it have a proper introduction?
- Have you mentioned the main points?
- Does it have a proper conclusion?

5. Did you show it to your ESP teacher and get his feedback?

6. Do you know the meaning of all the technical terms that you might use in your presentation?

7. Have you prepared a list of questions that your teacher and classmates might ask you after your presentation?

8. Are you ready to make your oral presentation?

Twenty-nine students gave oral presentations. After each oral presentation, the presenter was required to say whether he was satisfied with his/her performance, feedback was given by both the teacher and other students.

The response was so good that about 70 percent of the students came well prepared and presented their topics. The following is the list of oral presentation topics selected by the students.

1. Biotechnology: meeting the needs of the poor?
2. The Pros and Cons of Genetic Engineering.
3. The Pros and Cons of Genetically Modified Food
4. Bioethics
5. Genetically modified foods
6. Genetically engineering microbes for bioremediation
7. Cloning whole organisms
8. Embryonic stem cell research
9. Gene therapy
10. Genetic testing
11. Genetic Engineering of Animals
12. Genetic Engineering of Plants
13. Application of Genetic Engineering to Human beings and their health.
14. Biometrics
15. Biotechnologists are playing God.
16. Herbicides and its effects on human health.
17. What is biotechnology?
18. The human genome project
19. Ethical issues of human genome project.
20. Whose genome is it, anyway?
21. An interview with DNA Forensics Authority Dr Bruce Weir
22. The chips are coming (biochips)
23. GM products: benefits and controversies
24. Genetically modified crops in India
25. Cloning the first human
26. Brave new cloning world

27. Human clones
28. Scientific reasons for not cloning humans.
29. Eugenics
30. Biologically-inspired machines
31. Trading human life
32. DNA Fingerprinting
33. Application of Biotechnology in Healthcare
34. Biosensors
35. Recombinant DNA Technology
36. The Pros and Cons of Stem Cell Research
37. Environmental Biotechnology
38. Biotechnology and Ethics
39. Biotechnology Drugs

4.2 Group Dynamics

Since the collaborative approach to ESP course design was used, it is very important to discuss how the ESP teacher and his students worked together and how the students worked in group to achieve the objectives.

It was a great challenge to work with a mixed group of students with a wide range of abilities in English. As it has been discussed earlier, many students lacked motivation and were not interested in attending English classes. The moment they felt that they were given importance they were motivated and later it was easy to convince them and get their cooperation. Most students submitted their assignments in time. Only one or two members in each group were either passive or could not contribute much to the success of group activities due to some personal reasons. In each group one student was a moderator and his/her role was to assign work to each member and get the work done. Finally, the moderators were asked to present their reports to the class. All the reports were quite positive about the students' participation.

4.3 Evaluation

How did the students find *English for Biotechnology*? Did it achieve the purpose for which it was designed? Were the course objectives fulfilled? To find answers to these questions it was decided to give an achievement test at the end of the course. But, due to time constraint, the test was not administered. Anyhow, the students were asked to complete the evaluation questionnaire and give their feedback on the following areas: the process of designing the course, the course delivery, their participation, overall impact of the course on them.

Course Design Process

The learners found the process of involving themselves in the course design and later presenting their topics in front of the class more rewarding. Their feedback can be summarized as follows:

- The orientation session helped us gain an insight into the world of ESP.
- We felt important since our views were considered throughout the process.
- The whole exercise was something new for us.
- The assignments were very innovative and useful.
- The process of designing the course instilled confidence in us.
- We could use the English language in context.
- The process of selecting reading and listening materials was a challenging task.
- Group activities were very useful and helped us develop our interpersonal skills.
- We got a real exposure to technical texts. Before deciding on one topic, we had to read three or four articles.
- We were asked to explain the rationale for selecting a particular reading text. It developed our critical thinking. The process of shortlisting reading texts in groups also fostered our critical thinking.
- It was a learning experience. By identifying technical terms and finding meanings to the terms, we could learn many new things.
- It was an opportunity to develop our presentation skill.

Reading texts

- The reading texts reflect our interests and needs.
- Since the reading materials were selected by the students, we feel that we are very much part of the course.
- All the reading texts are related to biotechnology.
- The texts are not too technical to read.
- The language is clear, has varied sentence structure and complexity.
- The topics have novelty.
- Most classmates find the reading texts interesting.
- The texts are very much student-centred.

Listening material

- VOA Special English is a very interesting programme.
- It is easy to understand.
- The programmes are a great source of information.
- VOA Special English helps us improve our English.
- It is easy to learn American English by listening to VOA Special English.
- VOA Special English listening material is the best part of our course.
- The programme helps us improve our pronunciation.
- We had many delightful listening sessions.
- It helps us improve our listening skills.
- I enjoyed the slow pace of reading by the newsreader.

Speaking and Oral Presentation

- We enjoyed taking part in group discussions.
- Role plays were good, but only a few could take part in such activities.
- Oral presentation was the best part of the course.
- All did not get a chance to speak.
- This activity instilled confidence in us.
- Not much was done to involve shy ones.

English in Use

- Crossword puzzles were very challenging.
- Error detection and correction exercises were very useful.
- We were not given time to complete all the tasks.
- The teacher was in a hurry to complete the course.

Writing

- We found the process approach to writing very useful.
- It would have been better if the teacher had assessed at least one essay of each student and given his feedback.
- Due to time constraint, we could not complete all the tasks.
- We need more practice in writing.
-

4.4 Conclusions and Suggestions

Conclusion

Designing an ESP course with the collaboration of learners is not an easy task. The ESP teacher faces many challenges. The orientation session helped them understand the concept of ESP and trained them in evaluating ESP course materials and selecting appropriate texts for the supplementary course. Almost all the students actively participated in the process of the course design.

Both the ESP teacher and the learners found the whole process of setting objectives, selecting materials and designing the course *English for Biotechnology* exciting and rewarding. The learners' enthusiasm and cooperation was a motivating factor for the researcher to take up the challenging task of involving them in the course design. The success of any ESP course depends on the involvement of learners in the course design.

Students attended the course enthusiastically and took part in all group activities actively. The learners' participation in the course design motivated them to attend the course with much

enthusiasm. Since most students were familiar with the course materials there was much interaction among the learners when the course was taught formally.

Course development is an ongoing process. The ESP teacher is a constant learner. He should be willing to change his teaching methodology and make ESP courses interesting to his students.

Suggestions:

The effectiveness of the course has been field-tested and proved to be fruitful to a particular group of students. It is likely to have a positive effect on a new group of first year students of biotechnology. The following suggestions are given to make the ESP teaching more relevant, interesting and useful to the students.

- To prove the effectiveness of the course, some other ESP teacher should use the materials with slight modification or adaptation to some other group.
- The ESP teacher should constantly evaluate the effectiveness of the course material.

- When published books or course material are not suitable to any particular group, the ESP teacher should analyze the needs of the group of learners and accordingly modify an existing course or design a new course.
- The ESP teacher should be willing to provide his/her learner with supplementary materials.
- The ESP learner should be involved in the process of designing ESP courses.

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