THE SCOPE FOR USING NEW TECHNOLOGIES IN TEACHING ENGLISH IN THE TECHNICAL INSTITUTIONS IN ASSAM : AN EXPERIMENTAL STUDY

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I certify that the thesis "**The Scope for Using New Technologies in Teaching English in the Technical Institutions in Assam : An Experimental Study**", submitted by ***Shri K M Baharul Islam*** for the degree of Doctor of Philosophy of Tezpur University, is a record of original and bonafide research done by him under my supervision and guidance in accordance with the regulations in force I further certify that the thesis, either in part or whole, has not been submitted to any other university or institute for any other degree or diploma.

(*Madan Mohan Sarma*)

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Chapter 1: Introduction

1.1 English Language and Technical Institutions in India

According to the Indian Constitution as many as 18 languages are enlisted as state languages. The makers of the constitution declared Hindi the official language of the Union. English, however, continued to be the linking language between different states in official matters as an associate language. Various Language Commissions were set up from time to time and they repeatedly recommended that English should be retained as an associate official language.

The choice of language as the medium of technical Education in India poses a difficult problem. None of the fifteen major Indian languages is developed enough to cope with the needs of technical education of present day. English is moreover the most extensively used scientific and technological language of the world. Indian scientists will have an easy communication with their international counterparts if they are proficient in English. The industrial civilization, on the other hand, is not confined to boundaries of a particular country. If we are to catch up with others in scientific and technological fields we cannot afford to wait till our own languages are developed to that level. In such a situation we have to continue using English as the language for engineering and scientific education. The situation that exists in India today is that the

medium of instruction in all the colleges of technical education is English. This establishes the basic need for English in the field of Technical Education. Moreover, teachers have favoured its retention as they are aware of its many advantages in the area of science and technology and of the scarcity of teaching materials in the regional languages (IIT Kanpur 1990).

The general problem of linguistic heterogeneity in Indian classrooms becomes more prominent in technical institutions. Students are admitted through severe competitive tests and their knowledge of physical sciences is rather sound. But the mastery in different aspects of physical sciences has no direct bearing on language learning and acquisition as the role of language is rather limited in the teaching and learning of these subjects in comparison to that of humanities and social sciences. All these make for greater differentiation on the linguistic performance scale among the students who otherwise constitute a comparatively homogeneous group on the scientific scale (Ansari 1986). But in India this fact of linguistic heterogeneity is not taken into account and in most institutions these students are given a common course.

Another problem is that of selection and preparation of teaching materials. This problem can be dealt with in two ways - one is to select and prepare materials for linguistic teaching items from non technical fields of discourse, and the other is to use science and technology text books for language teaching. For the second option the teacher must

have some knowledge of or familiarity with scientific and technical subjects (Ansari 1986).

The learners' attitude is very much important in the process of language learning. But in technical institutions the English language class suffers from a kind of negative attitude to and motivation for learning on the part of the learners. Most of the learners are interested in getting through the course by securing the 'pass-marks' in the annual examination. Some of them are well aware of their weaknesses in the use of Englisg, particularly in their social peer-group interaction. But providing a special course marked out for the 'poor-in-English' students may damage their self-confidence. The course contents are also not always encouraging for many students (Kundu 1986).

In regard to the place and the role of English in a technology-oriented institution (such as an IIT or REC) one comes across the very nearly widespread view on the part of the engineering faculty as well as the administration that English is somehow a peripheral, superficial subject. Even the efforts to enlarge the field of electives or optional courses in it are discouraged. At least partly as a result of this, students come to look upon English as expendable, a mere adjunct and therefore it receives a low priority in their scale of things. Elsewhere, there is the be-devilling problem of lower minimum (compared to other subjects) for passing. Or, often enough, marks in the English papers are not considered for the aggregate performance or for the overall ranking of the candidates. The net result is that this lowered expectation inevitably

leads to lower attainment. Language specially in an institution of higher education must be regarded as a part of reality. Its study and teaching, therefore, must be motivated at all levels by an ontological commitment and seriousness of purpose. In order to overcome the attitudinal problems mentioned earlier and to focus on the relevance of English for students of science and technology, a teacher of English is requred to address problems which go beyond the academic, the scholarly and the pedagogical (Desai 1986).

1.2 Technical Institutions in Assam

Assam, situated in the northeast corner of India has a higher percentage of literacy than the National level. According to the census of 1991, the literacy rate for the State of Assam is 53.42% that is 1.31% better than the national literacy rate. However, the scenario in the field of technical education is not the same. The All India Council for Technical Education (AICTE) has emphasized the need for diversifying the technical courses and making them more relevant so that the products become more employable. With the establishment of an Indian Institute of Technology at Guwahati the technical education scenario in Assam has undergone a drastic change. The World Bank has also come forward to assist in the development and quality improvement of the technical education in the state under which the curriculum of technical institutes are being revised and updated to make them more relevant to our needs. A Curriculum Development Cell has started functioning under the Directorate of Technical Education assisted by the World Bank

with formation of the State Project Implementation Unit (SPIU) for the State of Assam (Akhtar 1997). Following are the major technical institutions of Assam:

A. University / Degree - Awarding Institution :
1. Indian Institute of Technology, Guwahati.

B. Engineering Colleges
1. Regional Engineering College, Silchar
2. Assam Engineering College, Guwahati
3. Jorhat Engineering College, Jorhat

C. Polytechnics

1. Assam Engineering Institute, Guwahati
2. Prince of Wales Institute, Jorhat
3. Silchar Polytechnic
4. Nowgong Polytechnic
5. Dibrugarh Polytechnic
6. Bongaigaon Polytechnic
7. Assam Textile Institute, Guwahati
8. Girls Polytechnic, Guwahati
9. Residential Girls" Polytechnic, Golaghat

1.3 English Language Scene in Technical Institutions in Assam

English is the medium of instruction in all the three types of technical Institutions of Assam. Moreover all examinations, sessionals, practicals, projects, laboratory work, as well as viva-voce examinations are conducted in English. The libraries of the institutions do not have any book in any other language but English for the Engineering and Technical subjects. This also indicates that English is the language of instruction in these institutions and the students have to take English language seriously to be successful in their course.

The students are admitted to the Engineering courses after vigorous admission tests and all these tests are conducted in English.

They are intelligent, motivated students who have made it to the programme through a stiff competition and so they have sufficient knowledge of English to understand the questions in Physics or Mathematics and to answer them. But a mere working language will not do where English is the medium of instruction, academic programmes and social interactions. Therefore, compulsory English courses are prescribed for them in their first year to help them master the language so that they can use it confidently, competently and creatively. Besides this heterogeneity among the students in their English language abilities there are some foreign students who are admitted without competitions and for those the teacher has to start from the very beginning at the elementary level of English language. As pointed out above Compulsory English language syllabuses prescribed for the students are invariably implemented in the first year of the course. The syllabuses prescribed by the IIT, Guwahati (APPENDIX :A) and other Engineering colleges (APPENDIX : B) also indicate a trend of teaching English through 'anthologies' and 'grammar-topics' without much emphasis on future occupational communication needs of the students.

State Polytechnics run diploma courses in various subjects of Engineering. The kind of course that is prescribed at present (*see* APPENDIX : C) is not so much based on students' perceived language needs. The students are able to understand the lessons but when it comes to writing they can not write grammatically correct English. Mistakes regarding the use of articles and prepositions are very common.

1.4 Problems of ELT in Technical Institutions in Assam

Technical Institutions, particularly at undergraduate level takes students who have already completed atleast 6-7 years of English language learning. Obviously, the confusion that prevails in the arena of teaching English also has far reaching impact on the ELT scene in the technical institutions. Some inherent problems of language teaching in the technical institutions aggravate the situation. Above all there are some problems which engulf the Indian education system as a whole and as such technical institutions are no exception in this regard. Therefore, while discussing the problems of ELT in technical institutions we have to take a broad view of English Language Teaching and then proceed towards specific issues that haunt the ELT practitioners of the technical institutions.

One of the characteristics of the ELT scene in India particularly at secondary level is the chaotic state of affairs without any specific action plan based on strong technical framework. The post-independence India has seen much debate regarding the position of English vis-a-vis mother-tongue(s) as the medium of instruction. In this tug of war, the fate of ELT in India is sometimes threatened by the very purpose of introducing English as a second language in school curriculum. The National Council for Educational Research and Training (NCERT), New Delhi with the help of the expertise from Central Institute of English and Foreign Languages (CIEFL), Hyderabad had tried to give definite aim to the English language teaching in our schools and fortunately most of the

states have adopted such modern structural syllabuses with clearly defined objectives of teaching English at different stages of a six-year course of study (Barua, 1991). But the deplorable condition of the standard of English language ability of an average student at 10+2 level makes the task more difficult for the language teacher in technical institutions. The aims and objectives of English language teaching in technical institutions are again a hazy area. The latest findings of ESP/EST researches are yet to find practical implications for the language classrooms of these institutions. This theory-practice gap constitutes the major problematic area of the ELT scenario in our technical institutions. However, this is also linked to many other 'inherent' impediments which a language teacher encounters while teaching English in a technical institution. "When I was teaching at BITS, Pilani," recalls Mohan Ramanan, "...the English faculty was hauled up by a committee of technologists who accused us of not taking enough care about providing adequate linguistic training to the budding engineers and pharmacists being produced by that premier Institution" (1996:39). This indicates the attitudinal barriers that the language teacher is faced with while executing an English language syllabus in a technical institution.

The typical attitude of our technical subject teachers has been that they can produce good engineers and technologists even without any command over the English language. For decades English remained a "peripheral" subject because students' performance in this subject is not reflected in their BE/B.Tech marksheets. A queer '30-marks-pass

paper' syndrome is well settled in the minds of our budding engineers. Such a trend apathetic to English language learning was further replenished and nourished by their Engineering teachers who were themselves poor in English. Many of them believed that they do not even need English teachers to teach English. However, the dawn of global economy and open market economy as it prevails in India today has forced upon them some hard facts of market competition. The communicative competence of an engineer-cum- 'salesman' has suddenly become a matter of great concern for both the graduating engineers and the prospective employers. Invariably, the engineer is not only tested in his subject but also in his ability to communicate in English through a group discussion or a language testing component at the pre-interview screening level. However, because of the lack of encouragement and support in terms of quality improvement of English teachers as well as language curriculum design, our technical institutions are still to give our engineering graduates the kind of competence in English which they require to enter into the job market today not to talk about the professional success at a later stage. This again hints at a demand-supply mismatch where the actual English language needs are not reflected or taken into account in designing our English language courses for Engineers.

The inability of our traditional 'compulsory English' courses to perceive the language needs of the Engineering students makes it an unwanted burden on them. The students are largely disinterested in the prescribed text books which are generally a hotchpotch of some standard

'anthologies'. The whole gamut of special use of English like media management, advertising, business communication, public relation and salesmanship etc. are yet to influence the English language text books / syllabuses of our technical institutions. This gap between the students' felt needs and prescribed instructional materials creates a constant conflict for English language teaching in technical institution.

The most crucial factor that haunts a language teacher in a technical institution is the lack of adequate contact hours between the teacher and the learner. English being a so-called peripheral subject in the technical institutions it often takes a back seat in sharing classroom hours compared to its 'engineering' counterparts.

Quality improvement of English language teaching faculty has not been handled professionally in our technical institutions. Cornered by their minimal existence and subjected to a kind of pet aversion on the part of the administration most of the language teachers in such institutions are frustrated. However, a number of ELT practitioners have pursued the latest researches in language teaching and kept themselves in touch with other ELT fraternity elsewhere. The general attitude of indifference towards humanities and social sciences in our technical institutions casts a shadow over the English language teachers also. This is the indication of a general trend of "disenchantment with the humanistic studies" which leads afterwards to resource crunch in these areas (Ramanan, 1996).

The faulty evaluation system which prevails in our education system in general also creates problems for the English language teachers in technical institutions in which the subject is aimed at giving the student a technical (specific purpose) orientation to their English language ability. A glance through some of the question papers of REC Silchar (Appendix: D) reveals that a handful of essay type questions which often promote large scale cramming of question-answers on some prescribed texts are the chief means of evaluation. This kind of examination system fails to test the specific linguistic skills of the learner and affects the standard of their achievement in English. For instance, there is no scope for oral tests/practice at undergraduate level though the spoken English is one of the prime area of interest among the students and employers alike. In other wards, the primacy of annual examination system as well as overemphasis on essay type questions fails to provide a sound base in English for any specific purposes, say, science and technology.

In recent years, the world has witnessed a technological revolution in our classrooms. Educational Technology has become the order of the day with more and more self study materials and learner-centred technologies like Computer Based Training (CBT) and Internet-based learning scenario viz, *Netversity* starting to dominate the teaching learning scene. Unfortunately, the ELT practitioner in technical institutions has been either denied any access to such aids or proper use of such aids has not been explored. Perhaps he could not cross the phase of educational 'aids' like blackboard and chalk till date though all

the latest state of the art technologies have been available in his institution. Linked to such a lack of use of appropriate educational technology are the dearth of trained language teachers in such areas and the absence of proper and conducive atmosphere for using such aids like computers in our language classrooms. However, some premier technical institutions in the country like IIT(s), IISc, Bangalore and select RECs have established language laboratories that are equipped with the latest equipment. But the general condition of our language classrooms in technical institutions presents a discouraging picture. And this brings us to the theme of the present study ie, the scope for using new technologies in the English language classroom in technical institutions. As we proceed with the present study it will be clearer how best an English teacher in a technical institute can use the available technologies to create a learner-friendly, effective language-classroom.

1.5 Review

Educational Technology is not new in India, though the growth and development of new technologies in our classroom initiative has been always slower than our counterparts elsewhere specially in the western world. On the other hand, language learning research in India has also shown tremendous progress particularly in case of ELT or ESL. Various methods have been tried over the years, then use and effectiveness have been reviewed, new approaches were developed and innovative classroom practices have been adopted. Mukhopadhyay (1989) reviews a corpus of 200 research studies on educational technology in India to conclude that

though a large amount of money is spent every year educational technology is still a "non-issue" in India. However, several studies have been conducted to assess the effectiveness of media use in ELT (Francis 1993).

With the development of ESP as a special branch of ELT, the English language teachers have entered a new domain of pedagogic research. ESP researches have been talking in terms of 'needs' (Munby 1978), 'discourse' (Allen and Widdowson 1974) and 'target situation' (Chambers 1980) as to what should be the basis of ELT courses for special groups of learners (eg. Engineers). In India several 'need-based' studies have been conducted at Indian Institute of Technology, Kanpur (IIT Kanpur 1990), the University of Delhi (Sood 1995), Indian School of Mines, Dhanbad (Singh, 1994), the University of Kashmir (Aslam 1995) to understand the needs of English language learners in India. These studies have established the fact that there exist a very strong demand among average Indian students, technical or non-technical, for learning and using the language for their professional and academic purposes. However, their felt language needs are not attended to their teachers as there is a mismatch between learners' felt needs and their teachers' assessment of learners needs (IIT, Kanpur 1990). Self-access language learning materials that are interactive and learner centred could have been the answer to their problems. With the advent of self instructional language instruction programmes, specially on Multimedia Computers, teachers could have a possible way of handling the complex variety of learners' needs even within limited allotted class hours for English. But

such potentials were largely unexplored and even if they were studied theoretically in India and abroad, the possibility of their use in actual Indian classroom scenario was not properly ascertained through any empirical study. Studies like IIT Madras CALL experiment (Francis 1993) showed the way technical institutions can use computers in language learning. But probably such studies are more criticized as a kind of 'dream-sequence' by the average Indian teacher. To them technologies are fund-hungry and it is not everybody's cup of tea to acquire the costly equipment. But such studies have also shown positive results elsewhere (Shinde 1998). Perhaps time has come to assess our own resources and study the attitudes of both teachers and learners towards the use of technologies. At the same time we should see how we can embrace technology into our existing system rather than to adjust the system to a new technology.

A quick review of the recent studies in technology initiatives in English language teaching has shown tremendous potentialities in this area. The most prominent focus of such researches was obviously on computer assisted language learning (CALL). The use of computers has been highlighted as a medium of communication and it envisaged a new social environment inside the classroom. Moreover, computers were also seen as a potential tool for "learner-autonomy, equality and learning skills". If used judiciously in the classroom, computer network for ELT can be built on "collaborative learning models" and "task-based learning" supported by proper pedagogy (Warschauer, Turbee and Roberts, 1996). James (1996), however, points out the inadequacies of available software

on speaking skill as far as oral interaction is concerned. He emphasizes the role of the teacher in computer-based activities. The teacher should see to it that the main focus is on classroom interaction and not on the computer itself. In other words, the strategy for using computers for speaking skill should be based on classroom interaction among learners.

In case of reading comprehension also, researches have shown the use of computer adaptive tests. In adaptive tests examinee's answer to earlier items will determine the flow of subsequent items of the test. The application of computer adaptive tests has been studied in detail by Canale (1986), Henning (1987, 1991) and Tung (1986). However, Young et al. (1996) pointed out the constraints of computer adaptive test such as "unidimensionality and homogeneity" and highlights the neutrality of the test method. However, computer adaptive tests, even with their limitations, are found to be suitable for tests of reading comprehension.

A recent development in language teaching practices through computers is the technique of Computer-aided error analysis. The method involves the analysis of 'computer learner corpus' which is a volume of language data produced by the second language learner. These data may be analysed by various analytical software to provide an insight into the learners' problem areas. Dagneaux, Denness and Granger (1998) have indicated in their study that computer aided error analysis will influence the future trends in ELT pedagogy Manning (1994) Discussed the role of collecting and interpreting the learners' language errors in developing intelligent CALL programs. In other words, the CALL

programmes, in order to become suitable for the specific learner groups, should be firmly based on the analysis of learners' data. Bull (1994) talked about developing CALL program on the basis of second language acquisition theories and learners' language awareness. Sustained discussion with the user on various language issues calls for a feedback mechanism that will facilitate development of CALL programmes. Roe (1994) argues that the language teacher "should rethink the learners' real needs and constraints" to decide the role of technology in foreign language teaching.

Murray and Barnes (1998) point out the most alarming aspect in the use of multimedia computer systems in ELT. They call it the *"wow"* factor or the initial reaction of the user towards a computer-based programme. They pointed out that the teacher, from the pedagogical point of view, should seriously scrutinize multimedia language learning software. The teacher has to be very cautious in selecting his software after evaluating them with his own teaching experience.

The role of research in learner needs in developing any technology based LET program has therefore been emphasized by a number of past studies. Matthews (1994) advocated for the synthesis of CALL 'programmes' and 'research agendas' which will highlight the concerned issues in second language acquisition. Goodfellow (1994) again emphasizes the need to address the learners' need and interactivity in computer aided vocabulary learning. Guillot and Kenning (1994) explored the use of electronic dictionary and highlighted the attitude of students

as an important aspect for fruitfully utilising the computer-based resources. Dictionary extends its use as a reference tool in its traditional form and helps the learner in the acquisition of second language vocabulary. However, the future use of such resources obviously calls for an exploratory and interactive environment (Zahner, Gupta and Olohan, 1994).

Extensive use of new technologies like multimedia computers and complex CALL programs, however, should not underestimate the traditional pedagogical concepts like " drill and practice". Decoo (1994) has found that we should continue to explore the possibilities of new multimedia CALL but such an endeavour should be based on sound pedagogical models. High-quality drill and practice software should be developed side by side with more researches into more complex computer based training. Avoiding drill and practice CALL programs may limit their efficiency and misplace our attention in more 'wow-impact' areas of technologies in education. In all, as Decoo (1994) sumarises, efficiency of learning technologies will depend on apt handling of three factors – needs, hardware and teachers.

Against this backdrop the present study was undertaken. With a long history of pedagogic research both in the field of ELT and educational technology - it marks a crossroad where we can sit back and see how can we use the 'wealth' we have gained over the years for our actual classrooms. In the world of information super-highway we can not deny the force of media technology. But, are we ready to embrace those

new paradigms in teaching-learning or is it another 'dream sequence', 'utopia of the crazy few or an emerging reality' ? The question is better posed by Mukhopadhyay (1997 : 3) in the following words : -

> Computer, multimedia Internet, virtual realities, mass media are likely to change the cognitive processes. From 'learning to know' through 'learning to do' and 'learning to be' next millennium will belong to 'learning to live together' through the understanding of 'The Treasure Within' (Ref. Report of Delore Commission). New knowledge networks are likely to reshape, if not replace, the existing knowledge systems. With the new knowledge network will the current form of institutions remain as they are or get transformed into virtual and global institutions ! And, what would be the new planning and management paradigms of such new generation institutions !! And, Economics !!!

1.6 Objectives of the study

The objectives of the present study were to -

1.6.1 Explore the possibility of using new technologies such as Interactive Television, VCR, CD-players, Computers including the latest Multimedia Computers, teleconferencing etc. in the technical institutions with a view to facilitating the process of acquiring the competence and the skills of English by the students for fulfilling their needs ;

1.6.2 Analyse the attitude of teachers of English and the students towards the use of technological aids in the language classroom;

1.6.3 Develop a model for using new technologies in English language teaching in technical institutions.

1.7 Hypotheses :

1.7.1 There is enough scope for the extensive use of new technologies in English language classroom in all technical institutions.

1.7.2 The teachers of English and the students of technical institutions both have positive attitude towards more extensive use of new technologies for better utilization of teaching hours.

1.7.3 Certain changes in the existing English syllabuses of the technical institutions may be necessary for adopting innovative teaching methods and techniques involving the use of new technologies.

The data and the experiment results will be analyzed to confirm or disconfirm these hypotheses.

1.8 Relevance of the Study

In the fast changing world of today the teaching-learning situation in our classroom has also undergone several drastic changes. According

to R. L. Reid, there is a marked transition on one hand from 'audio-visual aids' to 'educational technology' and from program construction to wider conception of instructional technology on the other (1969). Again, there is a shift from a teacher-centered formal classroom situation to an informal learner-centered environment. And in such a context the pedagogical methods and applications may vary from teacher to teacher, learner to learner and from classroom to classroom. It depends primarily on the teacher to provide his pupils with the best learning experience within the broader boundaries of syllabus, classroom hours, tutorials, routines etc. In a populous country like India the average teacher-students ratio in classrooms is not encouraging for complicated psychological process like language learning. On the other hand, in technical institutions a subject like English happens to be a 'peripheral subject' in comparison to other technical and science subjects. The limited class hours allotted to the teaching of English are not adequate at all if one aims at developing specific language skills as desired by the learners. Moreover, the opening of global market and the consequent thrust on export-oriented economy have again directed the attention of our educators towards the need for better proficiency in English for international communication.

Against this backdrop, the proper use of new technologies for language learning vis-a-vis the existing syllabus pattern in our technical institution will be relevant for understanding the role of and the scope for educational technology in the context of language learning environment in technical education. Though the need for the English language ability

is strongly felt by the students of the technical institution, the English language teacher is virtually crippled by the limited classroom hours allotted for teaching English in these institutions. In an attempt to find the ways for resolving this conflict in time management, this study aims at exploring the possibilities of using modern teaching aids to boost their language learning needs. Considering the encouraging results of the earlier studies in this area it can be assumed that an experimental study will lead to a concrete model and action-plan for the language teacher to use the new technologies in his classroom.

The study will, therefore, enable us to get a clear picture of the attitude of the teachers and the students towards the use of new technologies in Indian classroom scenario. It will enable us to state precisely how new technologies can be effectively used to teach the English language to the technical students. It will thus develop a model for using technologies as aids to make English language classrooms more learner-oriented and interactive. The strategies developed in the course of study can be fruitfully used in other technical institutions.

1.9 Design of the Study

In order to conduct the present study the researcher took the following steps:

1.9.1 A survey was conducted to see :

(a) Students' and teachers' attitude towards the use of new technologies in English language classrooms; and

(b) the availability of new technologies in technical institutions.

Questionnaire, Attitude Scale and Interview Schedules were the major tools for the present study. For this purpose interview schedules and questionnaires were prepared and administered to a representative number of technical institutions.

1.9.2 In order to develop a model for using new technologies in the classroom and to study their effectiveness, the researcher conducted an experiment at the Audiovisual and Multimedia Instruction Laboratory, Regional Engineering College, Silchar (Assam) in the following manner:

(a) After selecting the suitable component of the syllabus and learning materials the researcher used appropriate aids such as TV, Video, Computers, Multimedia packages etc. for developing learners comprehension of the content and specific language skills.

(b) To assess the utility of these aids two tests were administered among the learners - one prior to the starting of the experiment and the other at the end of teaching semester i.e. 6 months.

(c) The above mentioned experiment were conducted at REC, Silchar on the 1st semester BE students. A diagnostic test was conducted to choose two groups of 50 students each within a comparable level controlling other parameters. One of the group (*Control Group*) was

taught in the usual manner prevalent in the REC. The other group (*Experimental Group*) was taught with the help of new technologies. Both the groups were given pre and post teaching tests as proposed above to compare the performance of the two groups in terms of raw scores and in terms of abilities or skills. The research design is illustrated in Figure:01.

(d) The researcher prepared five model lesson plans to teach the selected components of the syllabus to the experimental group.

(e) The researcher developed a tentative model for using the new technologies with a view to revising it and arriving at a final model.

(f) The researcher repeated the experiment mentioned in (b) and (c) above to further test the applicability of the model.

1.10 Scheme of Chapterisation

The findings of this study have been organised in the following manner:

Chapter I begins with a discussion on the status of English language in technical education in India and discusses the language options in this arena of higher learning. This chapter also gives an overview of the technical institutions of Assam and various problems of English Language Teaching in technical institutions. This chapter

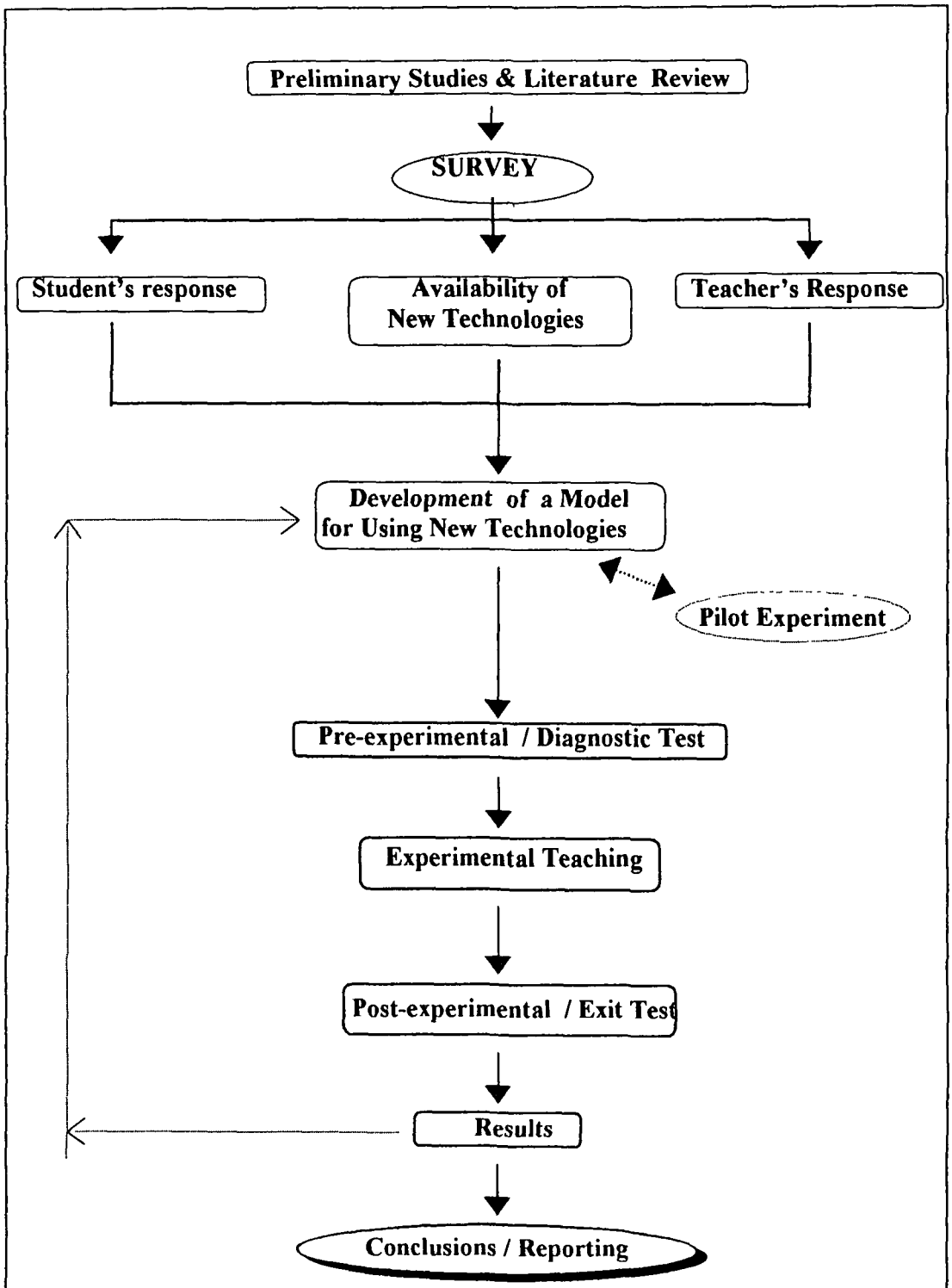


Figure: 01 : *Research Design*

introduces the problem, sets forth the objectives, hypotheses, methodology, relevance and significance of the present study.

Chapter II discusses the concept of ESP and highlights the emerging trends in ESP. This chapter relates these trends to the study undertaken here.

Chapter III defines, analyses and classifies Educational Technology and traces its role in the complex process of language learning. The chapter discusses the development of Educational Technology, its economics and constraints.

Chapter IV presents a detail discussion on various steps of the Educational Technology Survey conducted as a part of the present study and discusses its sampling procedure and questionnaire tools. The results of the Educational Technology survey are also presented in this chapter.

Chapter V presents a 'model' for using new technologies in the ELT classroom. It presents the use of various technologies in an illustrative lesson-plan to show the proposed activities along with the progress of the prescribed texts.

Chapter VI concludes this study with a summary discussion and major conclusions drawn from this study in terms of *scope*, *availability and effectiveness* of the new technologies in the ELT classrooms of the technical institutions of Assam.

Chapter 2 : Theoretical Framework

2.1 Introduction

English language teaching scenario has undergone radical changes over the years in terms of theories and practice. The needs of the language learner have also changed in view of the changing social patterns. Gone are the days when grammar and rules used to govern the pedagogic practices of the ELT practitioners. Those theoretical assumptions have also changed and the ELT practitioners have responded well to the demands of the new professional world of Medicine, Law, Commerce, and Technology. English for Specific Purposes (ESP) was a response to the growing needs of the professional world. In this chapter various theoretical concepts of language learning in ESP pedagogy have been discussed. The emerging trends in ESP have also been traced with a view to exploring the future possibilities.

2.2 English for Specific Purposes

Over the years the purpose and objective of ELT programmes have undergone drastic changes. The new world order with its 'global village' perspective has put tremendous pressure on the average communicator in any language and English in no exception. ELT programmes were (in

India they still are) dominated by 'noble goals of literature and grammar'. Traditionally the ELT programmes were treated as a 'subject' in school and in post-school system. The changes in theoretical assumptions and pedagogic practices in ELT and the cumulative pressures on the ELT professional to cater to the special needs of communication in specific areas like Business, Medical Practice, Legal Advocacy, Science and Technology have led traditional ELT practitioners to react to new demands. "The concept of English for Specific Proposes (ESP) has", therefore "emerged as a professional response to the new demands. ESP concentrates on the specific communicative needs and purposes of the specialist learners" (Khan 1990: I). In the following discussion we will discuss these 'demands' in further details and try to trace the development of ESP through various changes in ELT scenario as a whole.

The post World War II period has witnessed tremendous growth in commerce and technology. People were asking for more than the general broad aim of ELT courses. They wanted English language to help them in their respective professions as an effective tool for communication. In other words, "whereas English has decided its own destiny, it has now become subject to the wishes, needs and demands of people other than language teachers" (Hutchinson and Waters 1987:7). Changes were also taking place in the arena of linguistics where focus of attention was shifted from theoretical grammar of any language to its real life communicative use (Widdowson 1978). It was found that our spoken and written language differs from each other and they vary from one context

to another. Based on this assumption language teachers tried to identify the features of the language used in a specific situation and made those findings on the basis of new course designs (Hutchinson & Waters 1987). The 1960s and 1970s saw a number of studies on scientific and technical English (Ewer and Latorre 1969; Swales 1971; Selinker and Trimble 1976) which led to growth of English for Science and Technology (EST). New findings in the area of educational psychology have also emphasised the importance of learner and his views (Rodgers 1969). ESP professionals tried to make prevalent ELT courses more relevant to learners needs and interests in order to facilitate effective language learning. ESP, therefore, was a result of multifaceted changes in the field of ELT, linguistics and education psychology (Hutchinson and Waters 1987).

Since early 1960s ESP has passed through various phases of development - from the concept of special language or register analysis to a higher level beyond sentences and then to needs analysis or 'target situation analysis' (Hutchinson and Waters 1987). In the following paragraphs, we will discuss these phases and throw some lights on the emerging trends in ESP pedagogy.

2.3 Register Approach to EST

A number of researches in the 1960s were trying to identify those grammatical and lexical features which differentiate English language

used in Biology from that of another, say, Electrical Engineering. These features constituted a specific register and this concept of register was at the roof of the initial development of ESP (Tickoo 1976). Candlin observes

> ...the then popular term 'register' filled in nicely and gradually empirical research into the structures and vocabulary of scientific and technical specialisms led to materials which displayed in a most useful way the lexical and structural identity of a variety of such branches of science and technology, although the differences in structure that were isolated were fewer (1978 : 3).

An analysis of these registers leads to the identification of some language forms which ESP courses should specially attend. Ewers and Hughes-Davies (1971) found that science texts contain some language forms such as compound nouns, passives, conditionals, anomalous finites etc. and opined that ESP syllabus should focus upon these forms. *A course in Basic Scientific English* by Ewers and Latorre (1969) is an example of register approach in ESP (Hutchinson and Waters, 1987).

2.4 Discourse Approach

Henry Widdowson and the Washington School of American Linguists brought a new shift in ESP practices. The initial register analysis gave way to what is called discourse or rhetorical analysis. "The Register analysis had focused on sentence grammar, but now attention shifted to understanding how sentences were combined in discourse to produce meaning" (Hutchinson and Waters 1987:11). Through discourse

analysis one "closely observes the use of language in running discourse continued over a sequence of sentences and involving the interaction of speaker (or writer) and auditor (or reader) in a specific situational context (Abrahams 1993:232-233). Such observation will lead to identification of some language patterns which are focused upon in the ESP syllabus. The main aim of such ESP courses and texts was to make the learner aware of how sentences are arranged in texts to transmit intended meaning (Allen and Widdowson 1974).

2.5 Need Based Approach

As we have seen during the forgoing discussion, ESP aims at helping the learner to communicate more effectively in their professional or occupational situation. This assumption led many to focus on an analysis of the learner needs as the first step in ESP course design (Khan 1990). Language needs or target needs look at learners' target situation in terms of *'necessities"*, 'lacks', 'wants' (Hutchinson and Waters 1987). J. Munby used such a process of needs analysis or 'target situation analysis' in his *Communicative Syllabus Design* (1978). Richterich and Chancerel (1978) Suggested that learners' needs may be identified from three angles - learner himself, the teacher and the user institution.

2.6 Emerging Trends in ESP

If one looks critically at various language learning methods one can trace the paradigm shift from behaviourist principles to cognitive theories. In the development of ESP a similar shift in theoretical assumptions as well as pedagogic practices can be seen. While register approach or discourse analysis focused upon surface forms of language, the emerging trend in ESP is to look beyond the surface forms and to concentrate on the thinking process that underlies language use (Hutchinson and Waters 1987). Reading and listening skills as well as interpretive strategies of learners attracted the attention of a number of ESP workers (eg. Grellet 1981 ; Nuttal 1982 ; Alderson and Urquhart 1984). The new assumption was that reasoning and interpreting process are common to all language situations and not specific to any subject register. Chitravelu (1980) argued that reading skills are not language specific and there are some aspects of language (eg. structures of argument) which are not subject-specific. Following the cognitive language learning the learners were treated as the 'thinking beings or processors of information' who can find some meaningful pattern in any given discourse (Ausubel et al. 1978).

However, all ESP postulates have been primarily focusing on language 'use' rather than language learning. The latest trend in ESP tried to correct this lapse by giving adequate attention to the process of language learning. To design an effective ESP course we must therefore

observe "the processes of language learning" by adopting a "learning - centred approach" to ESP (Hutchinson and Waters 1987).

Before concluding our discussion on prevailing practices in ESP we should devote a little time to elaborate the two terms 'learning centred' and 'learner centred' because this study will deal with the greater use of educational technology as a 'learner centred' tool in the ELT classroom. Critics like Hutchinson and Waters (1987) have rejected the 'learner centred' as an approach to language learning because in an institutionalized system of pre-determined syllabuses, materials etc. a truly learner centred approach *par se* can be misleading. This study agrees with this view so far as ELT is concerned but uses the term 'learner centred' in respect of the use of technological aids. 'Learning' remains at the centre of our language teaching endeavour but 'learner' becomes central to the use of particular technological aids and determines their scope.

2.7 Summing Up

ESP was born out of the felt needs of the English language use in various professional fields. Various pedagogic approaches were adopted to execute ESP syllabuses and as such ESP itself has undergone various phases of development. Register analysis formed the basis of ESP in the initial stages in the 1960s and the 1970s. At the later stage attention was paid to language at 'above-the-sentence' level in what is called rhetorical

or discourse analysis. Target situation analysis focused on the learners' language needs in the target situation. For all these approaches the language was seen at the surface forms but later on ESP tried to explore the language at a deeper level – i.e. the thinking process behind language use. The common reasoning and interpreting process led to skill-centred approach in ESP (Hutchinson on and Waters, 1987). In the latest phase of development ESP focused more on language learning process than on language use and this trend continues to dominate ESP pedagogy scenario today.

Chapter 3 : Educational Technology in Language Learning

3.1 Defining Educational Technology

This study explores the scope and use of new technologies in ELT classroom. But, before we go into the marked area of our study with its restricted boundaries or *limitations* we may ponder a little over the gradual development and background of a broader area of interest called Educational Technology. It is within this wider spectrum of educational technology that we will probe into the role of new technologies in a language classroom.

Educational Technology or Instructional Technology evolved through years of interaction between teachers, teaching process and machines. If we go into the past we have on one hand, *'programmed learning'* and on the other *'audio-visual aids'*. While using teaching aids the teacher-user felt the importance of a systematic pedagogic pattern (which may be called 'program'). The synthesis of these two aspects - educational program and machines as aids to execute the program - led to the evolution of the new composite term 'educational technology'. Similarly 'programmed learning' also led to many issues like educational objectives, abilities of the learner, contents-methods-materials of instruction and assessment of outcome which goes beyond narrow

boundaries of 'programme construction'. Thus, *'technology of education'* attracted the attention of the teacher. Educational Technology, as it stands today, brings both these two aspects under its preview (Reid 1969).

Educational Technology, if we try to reach a comprehensive definition can be interpreted in two ways - One, 'technology of education' i.e., the use of scientific knowledge for improving the teaching learning process "and second, technology in education i.e., use of technological hardware in education" (Dash and Menon 1997 : 88). As discussed above the first interpretation involves selection and use of media material, personnel and knowledge resources while the second involves machines as teaching tools. In a language classroom *technology of education* and *technology in education* should go together 'against an excessive emphasis on technology over methodology and real learning needs" (Fox et al. 1990 : 5).

In Indian context educational Technology took a long time for initial development. The first phase of 'media in education' was forty years late to reach this country in the 1980s. Meanwhile, educational technology elsewhere in the world has passed through the second phase and reached the third phase of 'interactivity'. Our educational planners remained preoccupied with allocation of funds and appointment of teachers in their conventional approaches to education (Mukhopadhyay 1989a). But things have changed over the years and this study in set

against the present day scenario in India which is 'well advanced in the technical and software aspects of the new information technologies (Sharratt 1996 : 9).

3.2 Role of Educational Technology in Language Learning

A cursory look at various methods and approaches of language teaching makes one observe two broad divisions in all these approaches are 'formal' and 'informal'. While the formal approach focused on 'instructions' and 'teaching' the informal approach (eg. Communicative Approach) focused on 'learning' and spontaneous language interaction (Fox 1990). We will now discuss where the emerging new technologies can be used in language learning process.

Jeremy Fox et. al (1990: 7 - 8) enlists the following major roles which technology can play in language teaching-learning process :

-***presentation*** of materials in meaningful, motivating, relevant, helpful learning environments

(recent developments have extended the range of media with still and moving visuals, sound etc.)

- ***information*** source (computer databases can provide information about grammar, vocabulary etc.)

- ***evaluation*** of learning and detailed feedback (CALL techniques can provide the learner with detailed and complex information about his or her learning)

- improvement of ***quality*** of instruction and opportunities for learning (the learning materials can be finely tuned to the learner's needs if intelligent techniques are used)

- **writing** *aids / tools*, e.g., for word - processing (spelling - , grammar - , style -checker

Till date the principal resource material in language learning has been the text book. But in effective language learning process "book-learning" is not the last word and learners should "be exposed to samples of authentic language in meaningful, realistic contexts, and they be given opportunities to practice using the language, testing their hypothesis about how sounds are pronounced (the phonological rules of the language), how meaning is expressed (lexical selection and morphological processes), and how words are combined into acceptable structural patterns (the syntactic rules)" (Handerson 1993 : 1).

It is therefore very much clear that educational technology has great possibilities and is capable to playing different useful roles. But, in no way machine can replace the teacher in language teaching-learning process. Language learning, to a great extent depends on the teacher who acts on the learning needs of the learners. Even the learner centred approach needs the teacher as a guide in the process of learning (Fox 1990). In other words, while we explore the scope for using new technologies in the ELT classroom we do not replace the teacher with machines or compete with them rather they supplement the teacher's role. Jeremy Fox et al. elaborates :

> At the moment, it is unrealistic to see the computer as replacing the teacher in modern language learning since computers alone are still incapable of providing the rich interpersonal communication and complex feedback that, one suspects, only teachers can provide. But new technologies can contribute to the creation of rich learning environments, and there are so many useful roles that they can play that it is equally unwise to reject them altogether as it is to make extravagant claims on their behalf (1990: 8).

The role of educational technology in language teaching-learning process is further discussed in details in the following paragraphs when we take up various types of technologies separately.

3.3 Classification of Educational Technology

In the foregoing discussion we have talked about educational technology as an umbrella term which implies a judicious blending of pedagogical approach (ie, educational) and use of technology as per the set objectives of a language learning programme. In this study we have further focused our attention on 'new technologies'. Here we will present a classification of available technologies whereby we can identify the new technologies. While the role of a particular technology will vary according to the pedagogic postulates adopted as a whole there is no denying the fact that irrespective of such approaches technology has a vital role to play in the teaching-learning process. Taking a cue from our earlier discussion on the application (*see* para 3.2 above) we can further elucidate the applications of various kinds of technologies in ELT arena.

A. Audio - tape based

1. Cassette recorders
2. Language laboratories
3. Listening centres

B. Video - tape based

1. Video recorders
2. Video cameras

C. Computer based

1. Question & answer software
2. Vocabulary programs
3. Language games
4. Text manipulation software
5. Simulations
6. Basic word - processing
7. Concept keyboard
8. Enhanced word - processing
9. In - house databases etc.
10. Concordancing
11. Hypertext (text only)
12. CD - ROM (text only)
13. Computers with audio / video players

D. Communications

1. E - mail
2. Computer conferencing
3. On - line databases
4. Fax
5. ISDN (Integrated Services Digital Networks)
6. Satellite TV

E. Multimedia

1. Interactive audio
2. Interactive video
3. CD - ROM XA
4. CD - I
5. DVI

K L Kumar (1993) classified the educational media into three groups - projected, non-projected and electronic media. But, for a brief overview of the various technologies we will discuss them according to the following five major configurations.

1. Audio Tapes
2. Projection Systems
3. TV, Film and Video Media
4. CALL
5. Multimedia Computers

3.3.1 Audio Tapes

Audio Tapes have been one of the oldest and traditional teaching aids for the language teacher. Multi-track recording pre-recorded audio cassettes, phonograph records and other forms of audio recording have been used to guide the language learner in model speech production through listening and accuracy practice. Recorded speech of native speaker and exposure to various speaking styles and dialects helped the learners to master the sounds of a new language. With gradual development of audio-recording equipment, particularly after the World War II, the use of such devices was more intensive in language classrooms. The 'audio-active-comparative' language laboratory came into existence and learners were able 'to record their own voices on a separate track of the audio cassette and then compare their pronunciation with that of the master recording, thereby receiving some feedback about their progress" (Handerson 1993:2). Speech analysis equipment's provided more scientific feedback on the accuracy of learner's articulation in target language. Audiolingual Method was boosted by structured pattern practice and habit formation through use of language laboratories. However, recorded audio materials were also helpful in the communicative approach as taped materials provided linguistic instruction to perform some kind of task through recorded messages / clues. Pre-recorded audiocassettes through tape dubbing system provided the language learner with the opportunity to use the tape for supplemental practice outside the laboratory / classroom

(Henderson 1993). With the latest addition of "visual equipment the language laboratories turned into 'learning laboratories' which opened up new possibilities for teachers of other subjects also (Bennett 1993). With the advent of computers, particularly the multimedia workstations, language laboratories are found to be on the decline but the use of audio-tape materials are "taken largely for granted" (Fox 1990).

3.3.2 Projected Systems

Educational Technology might have advanced much to include interactive computer network and Internet facilities of global "village". But the most traditional symbols of educational technology which still prevail in the minds of our teachers are projection equipment like Overhead Projectors (OHP) and Slide Projector (SP). These two machines are so dominant in the educational technology scene in our colleges and technical institutions (see Chapter 4.8) that we put them separately here for a detail discussion (leaving TV / Film / Video media in another group).

Overhead Projectors are the cheapest, simplest and perhaps the most effective of all projected aids (Kumar 1993). Considerable development have taken place in design and use of overhead projectors in teaching. The teacher can project prepared transparencies in a pre determined systematic manner and project them in front of the class. Language learning classroom needs a lot of successive language

materials to be presented to the learners in the classroom in a sequence (structural approach) and OHPs can be used in such cases. Moreover, the projected image and the teacher both remain in front of the learner which facilitates 'on line' feedback communication (opposed to Black board writing process with the teachers' back towards the learners !). With the use of the pointer and the overlay of different images OHPs can be an important tool in the classroom.

The recent development of liquid crystal display (LCD) panel has linked the OHP to computers. Now, whatever appears on the computer monitor can be sent to a LCD panel and then placing the LCD panel on the OHP, we can project the same image before the whole class. For a large classroom such LCD based OHP can do wonder in presenting lessons through computer presentation software like MS PowerPoint. LCD panels can also have input signals from other sources like a video cassette player (VCP). Duncan has enumerated both advantages and disadvantages of OHPs as follows (1969 : 37) :

Advantages	Disadvantages
1. Lecturer faces audience	1. Restricted movement possible
2. Spontaneity - yet preparation possible	2. Relatively costly
3. Mixed presentations possible	3. New technique has to be learned
4. Clean & Neat	4. Glare can be troublesome
5. Can be used in well lighted room	
6. Permanent record kept	

Table (1): The advantages and disadvantages of the overhead writing - projector

Another cheap, handy and popular projection equipment is slide Projectors which can project powerful photographic transparencies slides containing colorful pictures and graphics. The teacher may use his own voice or a pre recorded tape for accompanying the slides in a 'tape slide programme'. Language teachers can use the native speaker's voice [recorded from Radio / TV] and project select vocabulary in the classroom for articulation practice. This may be the economy alternative to the latest multimedia computers. A tentative list of advantages and disadvantages of slide projector has been presented by Duncan (1969 : 33) :

Advantages	Disadvantages
1. Automatic	1. Requires forethought
2. No technicians needed (no communication problem)	2. Requires preparation
3. Vivid colors	3. Needs correctly tailored facilities (blackout ?)
4 Very polished quality	4. Needs maintenance
5 Can be synchronized to sound - track	5 Relatively fixed order during lecture

Table 3 : The advantages and disadvantages of the 2 X 2 in, slide projector.

3.3.3 TV, Film and Video Media

Entry of television into the arena of education might have invited an extreme and, at times, skeptical views about its use. Educational Television programmes have been criticized as "popularized and superficial treatment of any subject" and its educational image has been formed to be over shadowed by its image as a popular mass media

(McLean 1969). Its recreational role has grown over the years and the present day world is witnessing what is termed as *Electronic Revolution* which has elevated the role of television as a "societal medium" (Mohanraj 1989). TV, film and video media taken together, has thus attained a respectable position among educational technologies used in large number of classrooms all over the world. It is found to be effective, motivating in nature, and can teach while entertaining the learners (Sylvester 1992).

As we have seen earlier, presentation of authentic, meaningful and need based language materials plays a major role in educational technology for language learning. In other words, language materials should be motivating, understandable and situation (need) specific. Video and film technology fits into this role of contexualising language materials (spoken expression in target language) to the situational use. Based on cognitive as well as communicative assumptions of language learning process, visual images can link the spoken words to a specific situation and the learner is successful in establishing a 'mental connection' between the two. Such an aid "can enhance the L2 learners' confidence, and give them a basis for hypothesizing about the language" (Johnson 1991 : 8). However, the success of such TV / Video / Film resources largely depends on the selection of materials according to the interests and needs of the learners and use of appropriate cultural context (Garrett 1992).

TV news broadcast, satellite TV channels as well as our (Indian) programmes in English can provide useful Video materials for ELT classrooms. Way back in 1986, Prof. Brian Hill of Brighton Polytechnic (Sussex) emphasised that TV and Video can successfully be used in the teaching of English in India (qt. in Sylvester 1992). At present a large number of language learning materials are available in the west which highlight the theory and practice of the use of authentic TV programmes to teach English. ELT practitioners in India are yet to use such TV programmes in a large scale. But it is found that even Doordarshan programmes may be used to teach English as most of our institutions have their own TV & Video equipment (Sylvester 1992). The National Policy of Education (1986) in its Programme of Action highlights the use of technological aids like TV and Video for improving the quality of education. A study conducted in India to compare the effectiveness of Video Assisted Instruction (VAI) over the conventional method of teaching English has found that VAI is accepted much more positively by the students (Karpagakumarvel 1991). Indira Gandhi National Open University (IGNOU), New Delhi, University Grants Commission (UGC), India and Consortium for Educational Communication (CEC), New Delhi are producing a number of TV and Video programmes on various subjects and the these are being telecast on National Television (Doordarshan) on a slot called 'countrywide classroom'. The Central Institute of English and Foreign language (CIEFL), Hyderabad has produced a number of ELT programmes for CEC - UGC countrywide classroom programme. These programmes have become immensely

popular among the viewers and learners. Some of these programmes which are available for sale on Video format (VHS/PAL) have been used in the experimental part of this study. Thus the TV / Video / Film resources whether produced for general telecast (eg. news, soap opera etc.) or specially produced educational programmes (eg. UGC - CEC telecast), are found to be very much useful in effective (language) learning.

Successful TV / Video / Film based language learning materials, however, demand a lot of preparation and follow up activities to be undertaken by the concerned teacher. General introduction, use of vocabulary and sentence pattern will also facilitate comprehension, and post viewing activities will motivate further use of target language in specific situations (Henderson 1993). In the course of such activities students' feedback may also be obtained to modify the learning activities for sustaining interest.

3.3.4 Computer Assisted Language Learning

Technological development in the field of computers has contributed much to what is called 'information explosion'. Information Technology has become the order of the day. Computer Assisted Instruction (CAI) and Computer Based Training (CBT) packages have flooded the market all over the world. The use of computers as a self instructional media has helped in achieving a wide range of educational

objectives (Shinde 1998). In the following paragraphs we will discuss various issues in the development of CAI and its implications on the language learning scenario ie, Computer Assisted Language Learning (CALL).

Scholars like B.F. Skinner and others in 1950s strongly advocated the use of 'programmed learning'. According to this model, learning materials on a specific topic or theme is thoroughly analysed and then divided into small meaningful segments or 'steps'. One step or meaningful segment of information is called a 'frame' and it contains information as well as questions. A learner passes through successive 'frames' or steps arranged according to the programme and responds to the questions in each step. His correct answers are 'reinforced' in the process and learning is achieved. The learner moves at his own pace and the teacher also observes the learner's progress to assess his 'programme'. This 'programme' is presented either in the form of written materials called 'programmed text' or by a teaching machine (eg. Computer). These were the basic principles of programmed learning that were later tested through various experiments. Later much improvement took place in the field of 'programmed learning'. CAI is a natural outgrowth of 'programmed learning'. Sharma compiles a definition of CAI and Computer Assisted Learning (CAL) as follows (in Shah 1986) :

> CAI : An educational concept which places the student in a conversational mode with a computer which has a programmed course. The programmed course selects the next topic or phase of study according to previous responses from the student, allowing each student to progress at a pace directly related to his learning capability.

CAL : Where teaching and learning in any part of the curriculum are aided by some application of the computer. The role of the computer can be as a teaching aid, or it can be more student-centered.

Intensive researches in the area of CAI led to its widespread use in language learning. The most established form of CAI in language teaching-learning is known as CALL which stands for Computer Assisted Language Learning. CALL has the potential of giving a learner "immediate access to textual, graphic, and spoken language samples, reference such resources as on line dictionaries and grammar summaries, and practice activities of numerous types" (Henderson 1993:4). Wyatt (1987) divides CALL activities into three broad categories

1. Instructional
2. Collaborative
3. Facilitative

Instructional CALL, as the term suggests, involves computers for tutorial purposes as well as for a flexible learner - paced language practice environment. Multimedia computers can provide interactive text with digitized sound, animation, film strips and digital video. CALL software have flooded the market in the form of 'electronic work books' which are highly structured but leave ample room for learners' individual interests, pace and specific language needs (eg. pronunciation). Feedback facilities are an integral part of CALL software and apart from step wise responses, the computer generally keeps a record of the learners' performance in a particular programme. Specific helps / explanations are

always available for any wrong answer or problem faced by the learner (Henderson 1993).

Collaborative CALL is based on the communicative approach to language learning which poses the learner with a problem-solving task. The learner in 'collaboration' with the computer solves the tasks (eg. language puzzle, story writing etc.) and therefore takes an active role in the learning process. The learner controls his own pace and interacts with the rich knowledge base of computer to reach a desired goal in language activity (eg. writing letters) (Shinde 1998).

Facilitative CALL allows the learner to use the computer as a tool in various associated activities in learning. Utilities like FAX, E-mail, LAN, WAN etc. can be used by the learner to facilitate his 'interaction' with peers or teachers. Sharing subject-contents in target language through a networked computer helped prevailing ESP practices. Thus a students of electrical engineering sitting in his lab, can hook upto the language teacher through LAN and discuss a new sentence pattern he has encountered in the engineering text. Some CALL software's enlisted by Fox et al.(1990) are presented in Table-3.

In the recent years a number of research projects have been undertaken elsewhere in the world, particularly in Britain, to study the potential of computer use in education particularly in Humanities group. Factors like increase in the number of students with no corresponding

hike in Universities' budget, pressures on the limited library resources and stiff competition in higher education to maintain standards and modularisation of courses have driven the attention of our educational planners and founders towards greater use of computer based learning (Deegan 1996). They have invested a large amount of money for the development and distribution of computer based learning materials. Some of such projects like *STELLA* (Software for the Teaching of English and Literature and its Assessment) Project at the University of Glasgow and *PALLAS* project at the University of Exeter were highly successful. These projects were funded under the Computers in Teaching Initiative (CTI) programme launched by the British computer Board for Universities and Research Councils in 1983. CTI has further augmented the research on computer based learning through subject specific centres like *the CIT Centre for Modern Languages* at the University of Hull.

In 1991 the Computer Board of Britain focused its attention on staff development for computer based learning programmes. As a part of Information Technology Training Initiative (ITTI), the Oxford Project Focused its attention on Hypermedia in Literature and Linguistic studies and produced a major report on uses and potentials of multimedia in Humanities (Deegan, Timbrell, and Warren 1992). One exemplary product of the Oxford Project was *The Poetry shall* ,a hypermedia authoring tool for teachers to develop packages on poetry (or even prose) lessons with hypermedia links to a glossary or dictionary, associated texts, images and grammatical help (Squires and Trimbrell, 1995 qtd. in

1. Type of Applications	Title	Producer
1. Question - Answers	1. CLEF series (Grammar Focus)	Comsoft, Maidenhead (UK)
	2. KOSMOS Language Programmes (Vocabulary Focus)	2. KOSMOS Software Ltd., Bedfordshire
	3. TEST MASTER	3. Wide Software, London
	4. Question Mark	4. Question Mark Computing, London
	5. SPREAD READ	5. Wide Software, London
2. Vocabulary	6. LINK WORD SERIES	6. Acornsoft Ltd., Wellingborough
	7. WordStar	7. Wide software London
	8. Vocab	8. - do -
	9. WORD PLAY	9. C.U.P., Cambridge
	10. MATCHMASTER	10. Wide software London
3. Text Manipulation	11. FUN WITH TEXTS	11. Comsoft, Maidenhead
	12. FLEXI - GAP	12. Dictionary Mkd. by Longman Group Essex.
	13. STORY BOARD	13. Wida Software, London
	14. GAPMASTER	14 - do -
	15. TRAY	14. Oxford Shire Country Council, Comp. Edn. Unit.
4. Simulations & Role Play	16. MALLORY	16. ILECC, London
	17. GRANVILE	17. C.U.P. Cambridge
5. Testing	18. CU Cert. Exam	18. C.U.P. Cambridge
6. Games.	19. Grammar Games	19. - do -
7. Multimedia	20. Interactive Multimedia Dictionary	20. Longman Ltd., London
	21. Infopedia	21. Future Vision Multimedia

Table : 3 List of CALL Software Titles (as given in Fox et al 1990)

Deegan 1996). Using *the Poetry shall,* the Oxford Project also prepared a hypermedia package on the Old English Poem *The Dream of the Rood.* Both these packages are being used and reviewed for teaching poetry and linguistics in counties like Australia and Germany. The latest Teaching and Learning Technology Programme (TLTP) was started in 1992 under which a TELL Consortium has been established with 37 collaborating sites to develop computer based learning materials for the teaching of modern languages (Deegan 1996).

In India the first large scale mass programme on computer education was started way back in July, 1984. One of the objectives of this Computer Literacy and Studies in schools (CLASS) Project was the involvement of teachers in the preparation of educational software (Datta, 1987). Results and success of CLASS were debated but it marked the beginning of computer based learning in India (Sridhar, 1989). Since then a large number of projects have been sanctioned by the Govt. of India under direct funding schemes for development of CAI packages and related research. Educational Technology and computer-based learning constitute a major 'thrust area' in funding. A number of individual and institutional research projects were undertaken on CAI (Nachimuthu 1991; Soni 1991; Balasubramanian 1998). Subject specific CAI studies were conducted on Economics (Ananandan 1998), Civics (Patel 1998), Rural Development (Kulkarni 1989), Physics (Subramanian 1991), Nursing (Rao & Deo, 1991), Science (Singh 1998), Horticulture (Chithiraichelvan & Melanta 1996), and Mathematics (Rastogi & Pawar

1996). Many institutional research projects on CAI were conducted at Centre(s) of Educational Technology (CET) located in institutes of higher technical education as well as in private institutions like NIIT Ltd., New Delhi and Tata Consultancy Services, Bombay. The National Informatics Centre, New Delhi has also done some pioneering works on CAI/Multimedia packages (Mathew 1995).

One of the major works on CALL has been done at Indian Institute of Technology, Madras in 1992 - 93 with the learners of B. Tech. Programme. The study was initiated with the use of word processor for ELT purposes and the experiment was successful in improving writing skill and removing problems of basic syntax. Word processor was found to be an 'excellent' tool in CALL (Francis 1993). A recent study was conducted at the S N D T University, Mumbai to develop a CAI package 'voice' and to study its effectiveness. The package was successfully developed and found to be effective in the try out experiment (Shinde 1998). However, all these studies were very much limited in their mass application and it is rightly said that in India CAI / CALL studies are still in its infancy (Mukhopadhyay 1989b). Effectiveness of CAI / CALL is yet to be tested at various levels of our education system and on even various emerging areas like ELT and ESP. This is perhaps the rationale of the present study.

3.3.5 Multimedia Workstations

While discussing the various issues and researches in CAI / CALL in the foregoing paragraphs, passing reference has been made to 'hypermedia' and 'multimedia'. In fact today we can not discuss computer applications without referring to multimedia which means integration of various media like text, audio, video, animation graphics etc. on the computer environment. It is in this sense that the term 'multimedia' has been used throughout this study to indicate computer mediated multimedia applications. Multimedia has already revolutionized the computer world and this application has also enriched the CAI and CALL systems. One of the important features of a multimedia workstations is its interactivity through highly improved 'computer user interface' and it is possible to implement a multimedia approach to language skill development. Another feature of multimedia environment is 'hypermedia' that imitates human mind's technique of creating links to access information. With large amount of storage space and quick processing power than the human brain, hypermedia allows a user to move from one point or *'node'* to another in the *'hyperspace'* already created by the package developer (Babusenan and Gera 1995). It has enormous capabilities for the foreign language learner who can get a resourceful learner-centred environment in the form of multimedia computer workstation. Large scale multimedia packages on language learning and language related materials are now available at an affordable price even in India. These packages are available in handy compact discs (CD) with lots of storage space. Any one can pickup a CD on language like the one

tried in this study (Longman Interactive Multimedia Dictionary) and navigate through various language modes like grammar, dictionary video clips, thesaurus, common error guide - all available on the same CD and gain meaningful exposure to target language. However, as the multimedia CD almost 'explodes' information on user's desktop its proper use alongside a 'rigid' ELT syllabus that is prescribed in the formal education system in India has to be explored (which brings us to one of the main objectives of this study). But, as Henderson says, with "increasing affordability of technology, multimedia has the potential of making a significant contribution to language learning through self instructional programmes" (1993: 5). Interactive multimedia allows the user to control the response of computer according to his choice and pace and learn effectively. However, to facilitate such meaningful and effective interaction multimedia software should be guided by need based *instructional design* (Shinde 1998).

3.4 Economics of Educational Technology

In India, whenever we talk about educational technology or for that matter any new technology in education the financial aspect of such an idea looms large as a big question mark. There is always a predictable question that when we can not afford to provide our schools and colleges with basic facilities like Backboard and building, can we dream about multimedia computers in classroom ? After all, we are a developing nation with severe resource crunch in our education budget, a major portion of which is spent on teachers' salary alone. But at the same time

we can not forget that India is also the country with the second highest number of professional computer programmers in the world with an Information technology industry which employs 1.4 lac personnel (Sharratt 1996).

The issue of cost effectiveness of educational technology can be discussed from two angles : the cost factor and the market factor. While cost of technology is coming down day by day, it is the market need and "push" which sells the technology. As a result of the working of these two factors we can see that while technology is becoming more and more affordable for the common user, at the same time there is an increased inclination of the learner towards new technologies. For instance, this study was undertaken with multimedia computers that cost around Rs. 2.00 lac each in 1996. But within two years the same computers are now available at one fourth of its earlier price. Similarly, when the CLASS project was started by Govt. of India in 1984-85, serious doubts were expressed about its cost-effectiveness and results. Though the project shown limited results in the beginning the computer awareness has been raised. Today after more than a decade we can see that computers in school has become the order of the day. The societal environment itself has started exerting pressure on the education system to adopt new technologies. Craze for schools with latest computers tells a lot about the prevailing scenario.

In fact, the economics of educational technology has to be seen in terms of such market demand and it obviously calls for better resource utilization and management. In this study, for instance, we are dealing with technical institutions that are funded by the state. There also exists a demand for better education (eg. English language ability). Now if new technologies are used for fulfilling this demand we have to mobilise our resources. Some of the possible options available to us are to appoint new teachers, increase class hours or to utilize the available technologies in a way to meet the situation. While the first two options are perhaps not available (reasons discussed later in this study) the third option is the most pragmatic one. The Govt. of India, through various schemes like Thrust Area Project, Modernization and Removal of obsolescence (MODROBS), R&D Projects, Centre of Excellence Programmes etc. has tried to create a conducive atmosphere for learning and research in technical institutions like IITs & RECs. Even polytechnics are not far behind in this regard. Technology is not 'unaffordable' atleast for such institutions. But due to the lack of research and motivation to use the available facilities the cost - effectiveness of such technologies are affected. We have discussed the reasons of such pessimistic attitude of teachers elsewhere in detail but it will be worth mentioning here that language teachers are basically uninitiated in the use of new technologies like CALL / CAI. It is not the cost factor that prevents the utilization of new technologies. On the contrary, it is the non-utilization of available technologies which decreases the cost effectiveness of the acquired machines. As Unwin (1993:178) says "*costs of new information*

technology in education would be more acceptable if benefits could be vividly demonstrated". If the language teacher sitting at an REC amidst hundreds of computers could not show ways of using new technologies, his counterparts in general colleges will find it more difficult to even procure a small PC. Moreover, in case of educational technology in ELT we have to think in terms of long term benefits like sustained language learning activities throughout the course i.e., for four years and engaging the students in an ongoing language activities which in not restricted to language classroom only.

Therefore the questions raised about the high cost of educational technology should be answered in the light of resource utilization and time management. Machines will continue to be cheaper in future but if we do not utilize even the OHP, its cost is hardly realized fully in terms of learning result. In the west we have seen that a constant increase in the member of students, users' pressure on the limited library resources and virtually no increase in budget have led the universities to explore the potentials of computers in Humanities (Deegan, 1996). Thus investments in technology required "support from within communities" which might benefit from them and established senior academics need further persuading. Otherwise new generation computer-savvy postgraduates are in danger of finding "themselves electronically disenfranchised" (Sharratt 1996). We can perhaps neutralize the cost factor with better use, need-based software development and learner-centred approach in our classroom. In case of EST, the technology is already there and with no

extra cost the CALL system can make the language learning classroom more effective. Unfortunately the poor infrastructural facilities of our fund-starved education system, particularly at primary and secondary levels overshadow the concept of educational technology. This dominant image often disputes the role of new technologies in the classrooms of even "technical" institutions.

3.5 Constraints of Educational Technology

Like any other system or approach educational technology also has some constraints. As indicated in the previous discussion, educational technology remains largely under-utilized in this country. Technological resources that are scarce in general are still to be utilized fully though the needs for their use are strongly felt (Kumar and Tripathi, 1998). In the course of this study we will try to trace the reasons for such under-utilization with reference to the technical institutions in Assam vis-a-vis ELT classrooms. However, a brief discussion will introduce such constraints that prevent the teacher from utilising such technologies in our institutions.

Several studies have been undertaken to identify the problem-areas in educational technology. Forwards (1987) cites the paucity of funds as one of the major problems of educational technology in India. Rao (1965), Sandhu (1971), Sawant and Khuspe (1986) conducted studies which also recorded similar findings (qtd. in Kumar and Tripathi, 1998). Kumar and Tripathi (1998 :13) listed some of these constraints

on the use of ET as seen by a sample of teachers from G B Pant University of Agriculture and Technology, India (see Table:4).

SL. No	Problems	Percentage of Teachers			
		MI	I	NI	TWS
Personal					
1.	Lack of information about media potential	23.91	51.09	25.00	92
2.	Lack of training in educational media	38.04	50.00	11.96	116
3.	Lack of time	5.43	23.91	70.65	32
Media					
4.	Unavailability of media	51.09	34.78	14.13	126
5.	Inappropriate and poor quality of media	27.17	43.78	29.35	90
6.	Unavailability of media at a central place	38.04	43.48	18.48	110
7.	Acquisition problem	32.61	48.91	18.48	105
Infrastructural Facility					
8.	Lack of appropriately equipped classrooms	32.61	43.48	23.91	100
9.	Lack of transpiration facility	38 04	48.91	13.05	115
10.	Lack of own media production facility	54.35	43.48	2.17	140
Administrative					
11.	Lack of administrative support	27.17	59.78	13.05	105
12.	Lack of Financial Support	57.61	23.91	18.48	128

MI = Most Important, I = Important, NI = Not Important, TWS = Total Weighted Score

Table 4 : Constraints on the use of ET by the Teachers
(Source : University News, July, 1998:13)

However the major constraints are financial, managerial and shortage of trained manpower on ET. Let us discuss these three aspects in some detail. The causal relationships between these three factors can be better understood if we take the last one first. The teacher training facilities / opportunities are very limited even in case of technical institutions. A new entrant to the teaching profession generally carries a deep impression of his teachers 'giving lectures'. Such new teachers are not initiated properly in ET use and as such they are not exposed to

the wonders they can do in the classroom even with an ordinary OHP. But whenever proper orientation programmes like induction courses for engineering teachers are organised, the use of ET in general gets due attention. For example, induction courses conducted by Academic Staff Colleges of Gauhati University (India) in 1995 and Aligarh Muslim University (India) in 1996 gave enough exposure to such ET use. But out of 20 new teachers who have joined REC, Silchar during 1996 - 98 only 5 could get a chance to attend those programmes. Consequently the remaining 15 new teachers are not so much enthusiastic about the use of ET and they add to the majority of the college faculty who do not have training on the use of ET, It is generally the motivation and personal interest of the particular teacher which promotes the use of ET in the actual classroom process. This untrained manpower will lead to ET mismanagement. ET as we know requires preparation and follow-up activities by the teachers. It also includes proper planning, maintenance and development ET hardware and software. Institutions surveyed under this study did not have any trained personnel like Audio-Visual Assistant to look after the equipment. So most of the ET equipment remain out of order in these institutions. This situation demands a kind of personal interest and managerial capability on the part of the faculty members at the departmental level. Moreover, due to administrative problems proper classrooms are not maintained (except the IIT, Guwahati) for regular use of ET materials (eg. in REC, Silchar). As indicated earlier the teachers are not trained to take such troubles and as such ET takes a back seat except during occasional seminar presentations. If the faculty members

are not interested in ET then research and development of ET is a remote possibility. Though educational technology is one of the major thrust areas for funding in technical education and the Govt. of India generously sanctions grants for ET development, to tap such resources, viable proposals have to be submitted by faculty members from each institute. So if such funds are not tapped, there will be an obvious effect on ET resources. On the other hand, if suitable project proposals are submitted on ET, funds are not so difficult to come by. Hence we may say that the proper initiation has to be done to introduce ET to our new teachers so that they may themselves sustain the ET and lead to its further development in the institutions. These three problem areas of ET are interlined (Figure : 2) and deserve our immediate attention. In the words of Kumar and Tripathi (1998: 12) - "In spite of the existing constraints, there is great promise, the only need is to initiate and propagate the process with all sincerity and honesty". However Educational Technology has its own constraints and economic concerns. The lack of funds and the dearth of trained teachers have been the most crucial problems faced by it. However economics of using technologies in classrooms has to be worked out in terms of utilization and management of available resources in our institutions. The available resources are mostly lying unutilised or underutilised due to the lack of sincere efforts and motivation on the part of the teachers and same is also true about use of new technologies in ELT.

3.6 Summing Up

The use of teaching aids on the basis of a sound pedagogic pattern or programme constitutes the foundation of Educational Technology. In India Educational Technology took a long time to develop itself but today we have arrived at an advanced stage in terms of hardware and software development. Educational Technology has its own role to play in the language learning process. Various kinds of technologies may be used for enhancing the efficiency of the language teacher and empowering the learner with more autonomy.

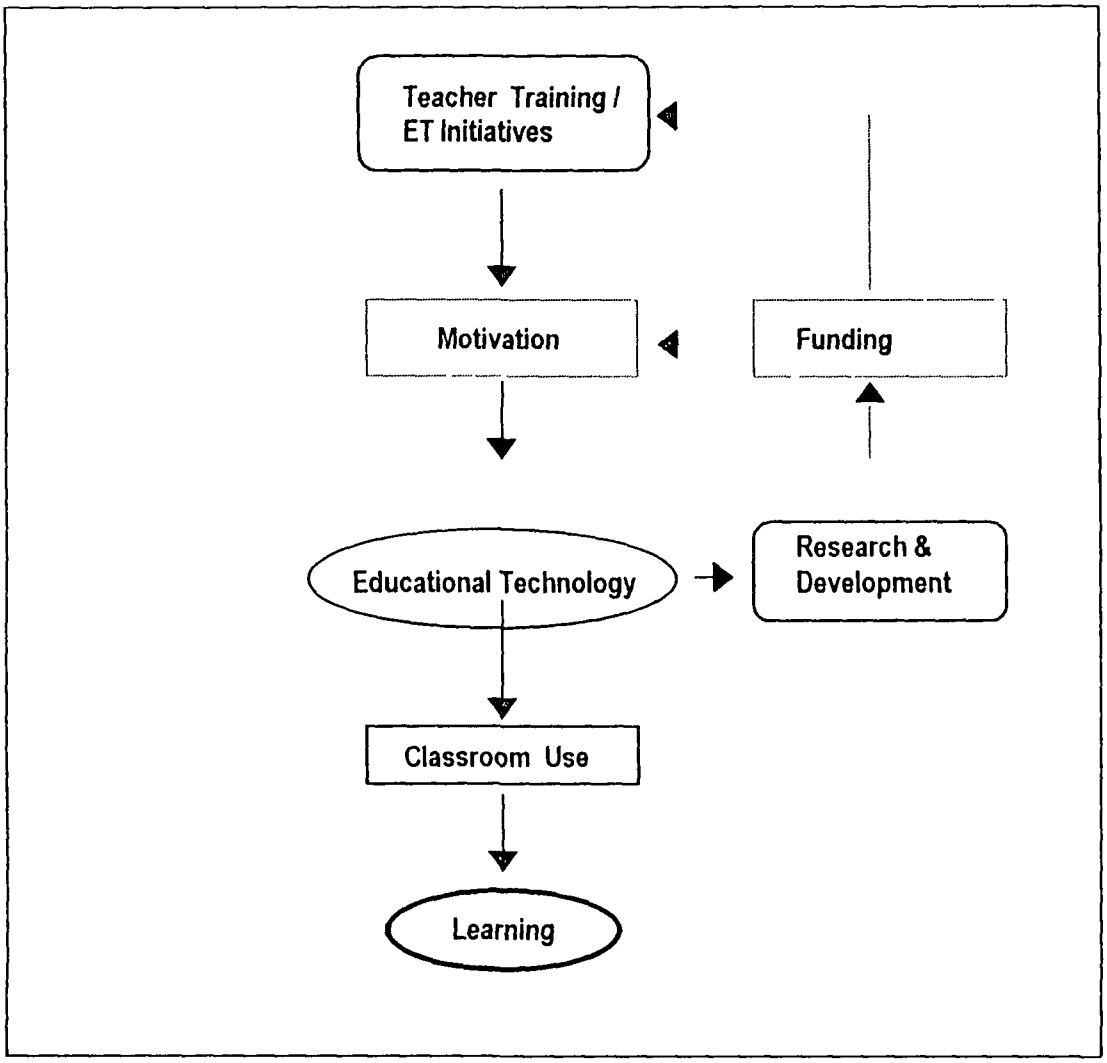


Figure -2 : Self -sustainability of Educational Technology

Chapter 4 : Survey

4.1 Objectives of the Survey

In conformity with one of the major objectives of this study, that is, to know the attitude of students and teachers (of English & other technical subjects) towards the use of technological aids in ELT classrooms, a survey (hereafter called *ET survey*) was conducted among the undergraduate students and teachers of technical institutions viz. Polytechnics, Engineering Colleges and the IIT. Moreover, the English language needs of the students as perceived by the students themselves and their English language teachers were also ascertained. The purpose of *language-needs* part of the survey was to identify the English language needs which form a basis for adopting a need-based approach in our ELT classroom (*see* the discussion on ESP in Section-2.5). Besides these two aspects, the ET survey also throws some light on the socio-cultural background of the learners and their interaction with English language till they reach the present level of education.

The **objectives** of the ET survey among the students may be enumerated as follows :-

Background	To know the sociolinguistic background of the learners and their exposure to English.

Use of English	To know the extent of use of English language vis-a-vis their regional language in various activities.
Needs	To identify the English language needs of the learners as perceived by them.
Attitudes	To analyse and understand the attitude and response of the learners towards - (a) the prevailing ELT course prescribed for them and (b) their interest in improving English language performance.
Response towards ET	The ET survey also seeks to understand the students' attitude towards use of modern technologies in their classrooms.
Availability of Technological Aids	To assess the availability of various technological aids for the language teacher in the technical institutions.

The ET survey was conducted among teachers of technical institutions in the light of the above objectives to get a fair idea about the teachers' perception of students' English language use, needs and their attitude towards use of new technologies in the English language classroom.

4.2 Survey Methodology

In order to conduct the ET survey among the students and the teachers two questionnaires were devised on the basis of similar surveys conducted earlier (IIT Kanpur, 1990 ; Singh 1994). A pilot-study was conducted at REC Silchar to test the questionnaires. Accordingly, the final questionnaires (Appendix :F & G) were developed on the basis of the feedback received from the pilot-study. The questionnaires were then distributed among 1000 undergraduate students of selected technical institutions of Assam, namely, Regional Engineering College, Silchar, Silchar Polytechnic and Indian Institute of Technology, Guwahati. Out of the 1000 questionnaires 773 were found complete in all respects. The Teachers' Questionnaires were distributed among 100 (English =13 , Technical = 87) teachers of these institutions. Out of the 100 questionnaire only 82 questionnaires were found complete in all respect. Moreover, personal interviews of the students and the teachers were also taken to cross-examine collected data and get more detailed views on specific aspects of the study. These collected data were then tabulated and analysed to draw conclusions in order to confirm or disconfirm the hypothesis of this study.

4.3 Samples

The students' questionnaire was distributed randomly among 1000 undergraduate students of selected technical institutions in 6:3:1

proportion (REC : Polytechnic : IIT). Among these students 40 (ie, 4%) were girls. However, the girls have showed better response than the boys (Table 5).

The teachers' questionnaires were distributed randomly among selected 100 teachers of the three institutions in the same ratio (6:3:1). Among these teachers 13 were English language teachers and the rest of them were from other subjects. The distribution may be seen in Table :6.

Institutions	Distributed			Responded		
	Male	Female	Total	Male	Female	Total
1. R.E.C. Silchar	570	30	600	561	23	584
2. Polytechnics	295	05	300	113	5	118
3. IIT, Guwahati	95	05	100	27	4	31
		Total :	1000	701	32	733

Table :5 : Distribution of Students' Questionnaires

Institution	Questionnaire Distributed			Response Received		
	English	Other Sub.	Total	English	Other Sub.	Total
1. R.E.C. Silchar	2	48	50	2	45	47
2. Polytechnic, Silchar	10	30	40	8	21	29
3. I.I.T. Guwahati	1	9	10	1	5	6
Total	13	87	100	11	57	82

Table : 6 : Distribution of Teacher's Questionnaire

The response from the teachers in terms of completed questionnaires (which were returned) has been encouraging (*see* Figure:3). The REC Silchar teachers were the most responsive among the teachers.

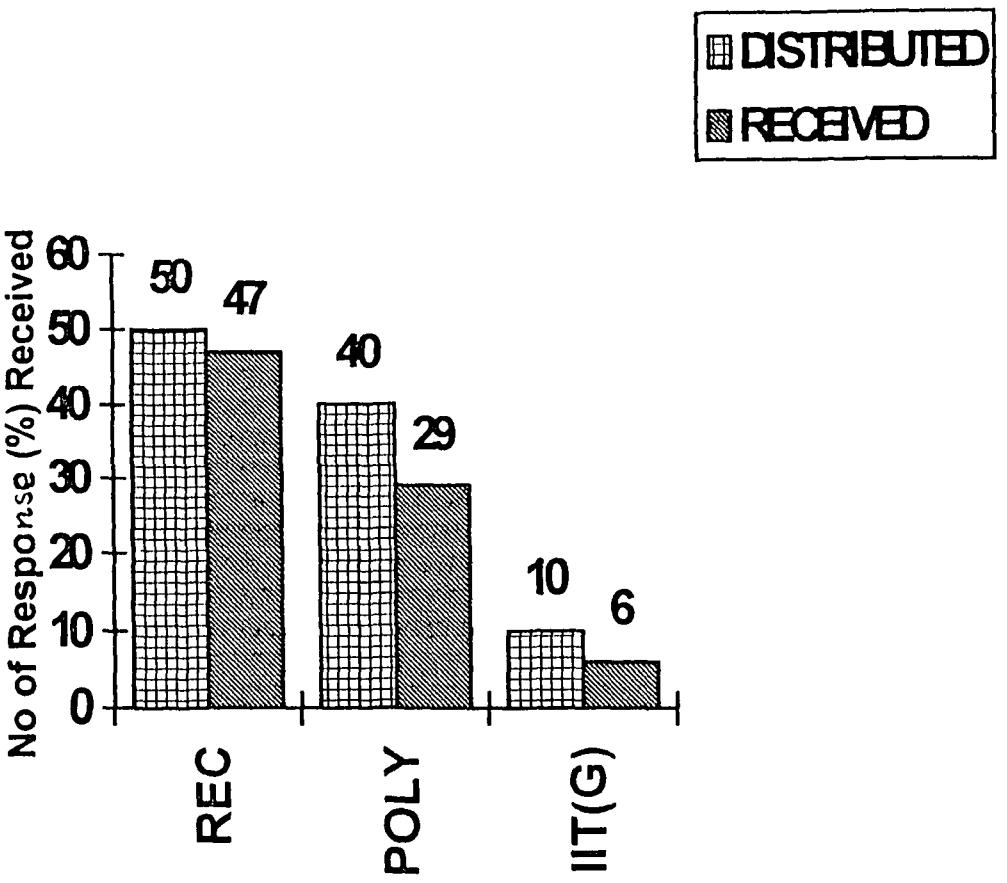


Figure-3 : *Institution - wise Response Pattern in terms of Completed Teachers' Questionnaire*

4.4 Analysis of the Questionnaires

4.4.1 Questionnaire for the Students

The Questionnaire for the students (APPENDIX :E) was devised to probe into the major areas as detailed below (Table :7) :

Area of Probe	No. of Questions *(asked)*	Sl. of Questions *(See the Questionnaire)*
1. Learner's Back ground a. Social b. Cultural c. Educational	12	1 - 12.
2. Use of English language by the learner & self appraisal	3	13 - 15
3. Learners Attitude towards English language course in a Technical institution programme	14	16 - 19 24 - 33
4. Identification of student's perceived language needs	10	20 - 23 34, 36 - 40
5. Attitude and Response towards Educational Technology in ELT	4	41 to 44.

Table : 7 : Analysis of Students' Questionnaire

4.4.2 Teachers' Questionnaire

A separate questionnaire (Appendix: F) was devised in the same way to know the teachers' point of view regarding various aspects of English language learning and needs of the learners and their attitude towards the use of new technologies in the ELT classroom. Such a comparative probe from two different angles was necessary considering the gap in perception that exists between the teachers and the learners regarding various issues like the need, the use and the syllabus for English (IIT Kanpur 1990). The questionnaire for the teachers was also divided into a few identified areas of probe viz,

1. Use of English

2. Attitude towards prescribed ELT course

3. Students' English language needs (as perceived by the teachers)

4. Attitude towards the use of new technologies in language classroom

It may not be out of place here to mention that though this study sought to concentrate on the English language teachers' response to use of educational technology in ELT classroom, responses from teachers of other subjects were also collected to get a comparative picture. It obviously brought out many issues which are common to both groups of teachers vis-a-vis the use of ET in classrooms.

4.5 Interview Schedules

As indicated earlier, in the course of conducting this ET survey, interview schedules were also used to elicit information which were pertinent to the study. The information are related to constraints of educational technology, institution-specific or learner-specific problem encountered in the ELT classroom. Some of the major issues which were focused upon through the personal interviews were :

1. Unique problems or obstacles faced in the ELT syllabus, methods adopted, materials used and aids available.

2. Institutional problems which are specifically faced by the English language teacher of a technical institution.
3. Availability of new technologies in the institutions for the English language teacher.
4. Problems of non-utilisation of Educational Technology in ELT classrooms.
5. Issues of faculty training in ELT and use of Educational Technology.

4.6 Data

The responses collected through questionnaires from the students and teachers were statistically compiled and tabulated. The statistically analysed data i.e., responses were calculated in percentage (rounded off) and these are presented below in respect of teachers and students. On some issues students' responses are compared with the teachers' response to get a complete picture of the survey results. In the following sections teachers' response implies the response received from the English language teachers only because this study is primarily focused on the response of the English teachers. However, on some aspects the difference of opinion between the teachers of English and the teachers of other technical subjects have been contrasted (*indicated specifically in the respective tables).* Analysis of the data on the background of the students is, however, placed separately at Appendix: G for cross-reference on attitudinal variations of respondents.

1. You use **English** in...

a. Reading Text / Reference Books			
Always	Sometimes	Rarely	Never
97	2	1	-
b. Answering in Exams			
Always	Sometimes	Rarely	Never
100	-	-	-
c. Viva / Interview			
Always	Sometimes	Rarely	Never
99	1	-	-
d. Presenting Reports / Sessions			
Always	Sometimes	Rarely	Never
98	2	-	-
e. Hostel / Social Activities			
Always	Sometimes	Rarely	Never
23	58	15	4

2. Do you use ***Regional Language*** in Classroom / Lab :

	Always	Sometimes	Rarely	Never
Students	15	43	31	11
Teachers	7	25	56	12

3. Assess your language skill yourself :

	Very Good	Good	Weak	Very Weak
a. Listening	33	25	29	13
b. Reading	41	32	16	11
c. Speaking	15	19	37	29
d. Writing :	11	17	46	26

4. Do you think there is a **need for English language** programme in your technical course ?

	Yes	**No**
Students	79	21
Teachers (English)	?	?
Teachers (Technical)	?	?

5. How would you like to learn / teach English ?

	As Compulsory Course	As Optional Course	As Optional Course
Students	32	21	47

6. What should be the medium of instruction at your institution ?

	English	Hindi	Regional Language
Students	88	7	5
Teachers (English)	91	3	6
Teachers (Technical)	97	1	2

7. Do you want English to be retained as the medium of Technical Education ?

	Yes	No
Students	91	9
Teachers (English)	100	-
Teachers (Technical)	100	-

8. Is English important for your [students'] future career ?

Profession	**Chosen by No of Students (%)**	**Proficiency in English Required** *(As felt by the Students in %)*
Management	87	71
Administration	41	21
Industry	79	23
Consultancy	68	13
Production	51	18
Research	15	7

9. Do you think that for Technical Education lack of Proficiency in English is a disadvantage ?

	Yes	No
Students	83	17
Teachers (English)	89	11
Teachers (Technical)	68	32

10. Would you like to devote some extra time in learning / teaching English language ?

	Yes	No
Students	88	12
Teachers (English)	78	22

11. Would you like to have / offer a special intensive English course ?

	Yes	No
Students	89	11
Teachers (English)	76	24

12. At which level would you like to have English language course ?

	First Year	Later
Students	53	47

13. Do you find your language course specially designed for your technical studies ?

	Yes	No
Students	89	11

14. Indicate your opinion about the Text/Learning Materials provided for your language course :

	Useful	Not Useful	Interesting	Boring
Students	17	35	16	32

15. Would you like to have some supplementary text in your language course ?

	Yes	**No**
Students	78	22

16. Do you understand your subject better if regional language is sometimes used in the class ?

	Yes	**No**
Students	83	17

17. Do you think that the technical subjects can be taught more effectively in regional Languages ?

	Yes	**No**
Students	52	48

18. Do you think that English is learnt better through books & lectures in your technical subjects rather than through an English language course ?

	Yes	**No**
Students	49	51

19. Do you think that your Engg/Technical subject teachers are well equipped to fulfill your special language needs ?

	Yes	**No**
Students	31	69

20. Do you think that a cooperation between your Subject teachers and language teacher will lead to better design of English language programme ?

	Yes	**No**
Students	72	28

21. Which language skill do you think is more important than others for your engineering / professional career ?

	Listening	Speaking	Reading	Writing
Students	12	47	17	24
Teachers	21	16	30	33

22. Do you feel you have a need to improve your English ?

	Yes	**No**
Students	91	9
Teachers	82	18

23. Indicate the skill you would like [your students'] to improve for the purpose of your Engg/ Technical profession :

	Listening	Speaking	Reading	Writing
Students	13	45	19	23
Teachers	18	28	23	31

24. Identify a specific area of weakness in using English language which needs immediate attention :

	Pronuncia-tion	Vocabu-lary	Writing	Reading	Speak-ing
Students	22	27	17	10	24
Teachers	17	16	30	14	23

25. Do you think that the time allotted for your English language class is sufficient to attend students' specific problems and weaknesses in English ?

	Yes	**No**
Students	17	83
Teachers (English)	20	80
Teachers (Technical)	37	63

26. How many hours (per week) will you need to amend your weaknesses in English ?

	5-10 hrs	10 - 15 hrs	15 - 20 hrs	more than 20 hrs
Students	37	43	11	9

27. Would you like have self-access learning aids like computers, audio and video lessons through which you can improve English language proficiency ?

	Yes	**No**
Students	85	15
Teachers (English)	79	21

28. Would you like to have such aids as learning-booster even if the English class time is extended to your desired length/periods per week ?

	Yes	**No**
Students	72	28
Teachers (English)	67	33

30. Put a tick-mark (√) against the learning aids/equipments which are use in your classroom :

Equipments	Students	Teachers
Television	-	-
Teleconferencing	-	-
Video conferencing	-	-
VCP	1%	-
Tape Recorder	-	-
Film / Cinema	-	-
Slide Projector	1%	-
Overhead Projector (OHP)	2%	-
Multimedia Computers	-	-
Internet	-	-

32. Put a tick-mark (√) against the learning aids/equipments you find suitable for the English Language course in your institution / classroom :

Equipments	Students	Teachers	
		English	Technical
Television	71	67	56
Teleconferencing	15	27	31
Video conferencing	15	28	37
VCP	33	34	49
Tape Recorder	23	40	18
Film / Cinema	34	31	19
Slide Projector	23	45	37
Overhead Projector (OHP)	21	51	41
Multimedia Computers	45	33	57
Internet	38	29	69

In the following sections we will discuss the results of the ET survey and present the major findings under the following broad headings that formed the basis for developing a model for using ET in the next phase of our study.

- Student's English Language Needs
- Availability of New Technologies

- Students' attitude towards New Technologies in the ELT classroom

4.7 Student's English Language Needs

4.7.1 Students' in general (87%) are very much aware of the need of English language for their future career. Among the two top choices of career viz management and Industry, English language proficiency is very much needed. As much as 83% percent of the students feel that lack of proficiency in English will be a disadvantage for technical education.

4.7.2 A large number of students (88%) expressed their willingness to devote some extra time to learning English language and they would like to have special intensive language course (89%).

4.7.3 Speaking is the most important language skill for the students (47%) followed by writing (24%), reading (17%) and listening (12%). However, their teachers have a different opinion on this point. Teachers think that writing is the most important skill (33%) followed by reading (30%). Teachers favoured these two skills primarily because the present examination system demands substantial reading of books and writing answers to get a technical degree.

4.7.4 Pronunciation, vocabulary and speaking in general are the prime areas of weakness for the students and they (83%) think that the limited time allotted for their English language class is not sufficient to

remove such weaknesses in English. And they (80%) need around 5 to 15 hours of English language activities.

4.7.5 The English language needs of the students (as perceived by them) are largely supported by their teachers. However, there exists a difference of opinion in case of relative importance of any particular skill (eg. speaking over writing) in the ELT courses (See Fig.6).

4.7.6 Students have expressed their dissatisfaction over the learning materials or text book provided for them in the English language course. At the same time most of them (73%) feel that the present language courses are not specifically designed for their technical studies. Students have indicated that in professions like management, industrial administration, production and teaching they require English language proficiency. Students also expressed their demand for more placement oriented English language skills and use. For instance, some of the senior students have apprehensions that they might face difficulty in "Group Discussion" test which constitutes an important part of the selection process. Students who can speak English well in their day to day environment have also expressed serious concern about how to "talk in an interview". These students felt that their English language course must attend to such "situational" and "special" needs in the use of this language.

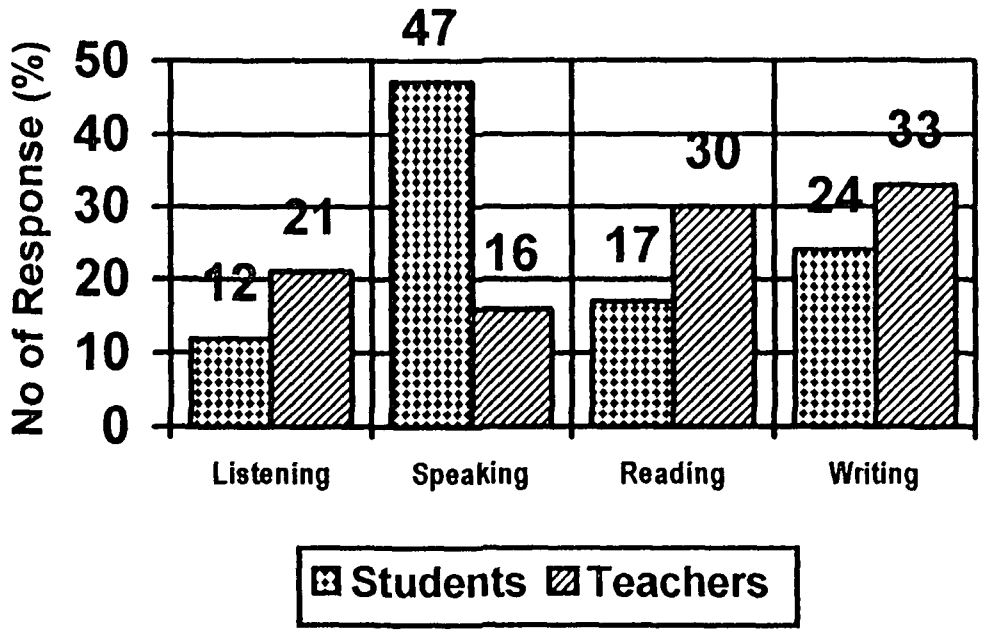


Figure - 4 : *Importance of language skill for Technical Profession*

4.8 Availability of New Technologies

The ET survey elicited some significant information about the availability of new technologies in the classroom. Interviews were of more help in identifying some issue like causes of non - availability and the difficulties faced by the teachers to get new technologies into their ELT classrooms.

4.8.1 Except slide-projectors and OHP no other technological aids are presently used in the ELT classrooms of technical institutions of Assam. The small percentage (1% - 2%) of use of these equipment actually indicates occasional special lecture programmes where such facilities are brought in for the guest speaker. It indicated that the age - old lecture method is still in vogue in the ELT classroom. The students (83%) think that the allotted classroom hours for English in the technical institutions are not sufficient to remove their specific weaknesses and problems (*see* Qs. No 25 above).

4.8.2 However, there are a number of new - technologies like Multimedia Computer, Internet etc. in the technical institutions which are not used for ELT purposes. The English language teachers said that they have not received any special training on CAI or CALL. Moreover, due to lack of infrastructural facilities like audio-visual laboratory and classrooms the use of such technologies in the ELT classroom has not been initiated. These "technologies" remained with "technologists" and

the teachers of Humanities Departments remained isolated from these innovations which are being used extensively by their counterparts in other parts of the world. The teachers of technical departments, however, feel that their colleagues in English Departments are not motivated enough to venture into the world of CAI / CALL. But, the question of overall non-utilization of available technologies for the teaching-learning process in these institutions is a valid one and it is accepted by most of the teachers during interviews. Many of them have cited various reasons for such non-utilization but among them the lack of training and the non-availability of classroom infrastructure were the prominent ones.

4.8.3 Regarding availability of new technologies the teachers of general technical institutions like Engineering College and Polytechnics feel that the resources are not "equally distributed". While Polytechnics are fund-starved, the REC and the IIT enjoy greater financial support from the government. As such these 'innovations' are seen as luxuries in the diploma level institutions particularly for the language teacher. Thus there is a sense of disinterestedness prevailing among the English language teachers regarding possible uses of new technologies at the first instance. But they are optimistic and well aware of the potentials of these new technologies.

4.9 Students' Attitude towards New Technologies in the ELT Classroom

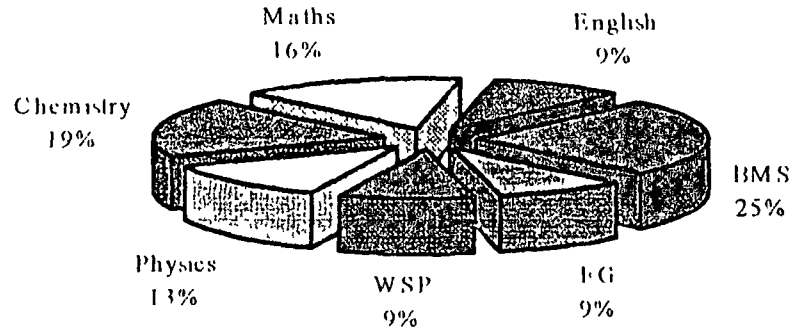
It is crystal clear from the survey that there is a felt need for better training in English among the students. They are very much aware of the importance of this language in their future career and as such they are ready to devote some extra time to learning the required language skills (in the area of weakness and occupational needs). Many of them (89%) opted for some "special intensive English course". But, the question now arises when and how. Regarding the allotted time for English language course the students were almost equally divided : while 53% of them wanted the ELT course to be offered in the first year of their B.Tech / Diploma course, 47% of the students wanted the language course to be available in the senior years. In course of interview the students of the former group indicated that the English language course should help them in their studies. So the first year lessons in English will serve their academic purposes throughout the course. The other group thinks that as the English language is a crucial factor in their placement prospects in the final year, English language course should help them throughout the B.Tech / Diploma programme.

But it comes out from the discussion with the teachers that English language classes are not allotted enough periods in the class routine. It is not feasible also to earmark too many hours for English in view of technical subjects deservingly receiving prime attention in a

technical institution. The All India Council for Technical Education (AICTE) in its guidelines for technical institutions in the country (1996) has allotted 5-10% of teaching time for Humanities & Social Sciences under which English language is taught. The language teacher at RECS, for instance, gets only four hours a week to teach English to 1st Semester BE students. These limited class hours are not sufficient to teach specific language skills as desired by the learners. It poses a more difficult problem for the students who are weak in English and need special attention from the teachers. A typical time share chart at RECS (1996-97) is given in Fig: 5.

4.9.1 A possible suggestion has been put forward by this study (*see* Section 4.6, Qs No.27 above), and the students (87%) have overwhelmingly supported the use of self-access learning materials like computers, audio-video lessons to improve their language proficiency. Students have opted for such technologies even if the normal ELT class period is extended to their desired length / number of periods per week. This indicates a very positive attitude of the students towards use of new technologies for ELT classroom.

4.9.2 Students have indicated their choices of new technologies which they find suitable for the prescribed English language course in their institutions. Television (71%), Multimedia Computers (45%) & Internet (38%) are the top choices. Video and cinema are also favoured by a large number of students. It is found that the students wanted the



* WSP Wokshop Practice
* EG Engineering Graphics
* BMS Building Materials & Surveying

Figure : 5 : Distribution of class hours at REC Silchar for BE 1st Semester

English teacher to guide them in using these technologies towards the desired aim of language learning. They were well aware of the possible uses (in fact, they suggested a few) but they still felt the need for teachers in such a process of self-learning.

4.10 Teachers' Attitude towards New Technologies in ELT Classroom

Teachers of English in technical institutions have expressed great dissatisfaction over the prescribed course, lack of enough class-hours and an the overall apathy they face from the administrators in such institutions. They feel the pulse of the learners as it appears from the comparative responses of the students and the teachers, but they are helpless to do something in this direction. The teachers feel that the lack of training and orientation in the use of new technologies makes them unable to use those innovations in their classrooms.

4.10.1 A large number of teachers (79%) feel that the students can really improve their English language proficiency through the use of self access language learning aids like computers, audio and video lessons. But, they have opined that there must be a systematic model for using such materials under the framework of the prescribed syllabus. A synthesized model has been desired because teachers at the institution-level can not modify the syllabus which is prescribed by the University. As such any attempt to use new technologies must aim at

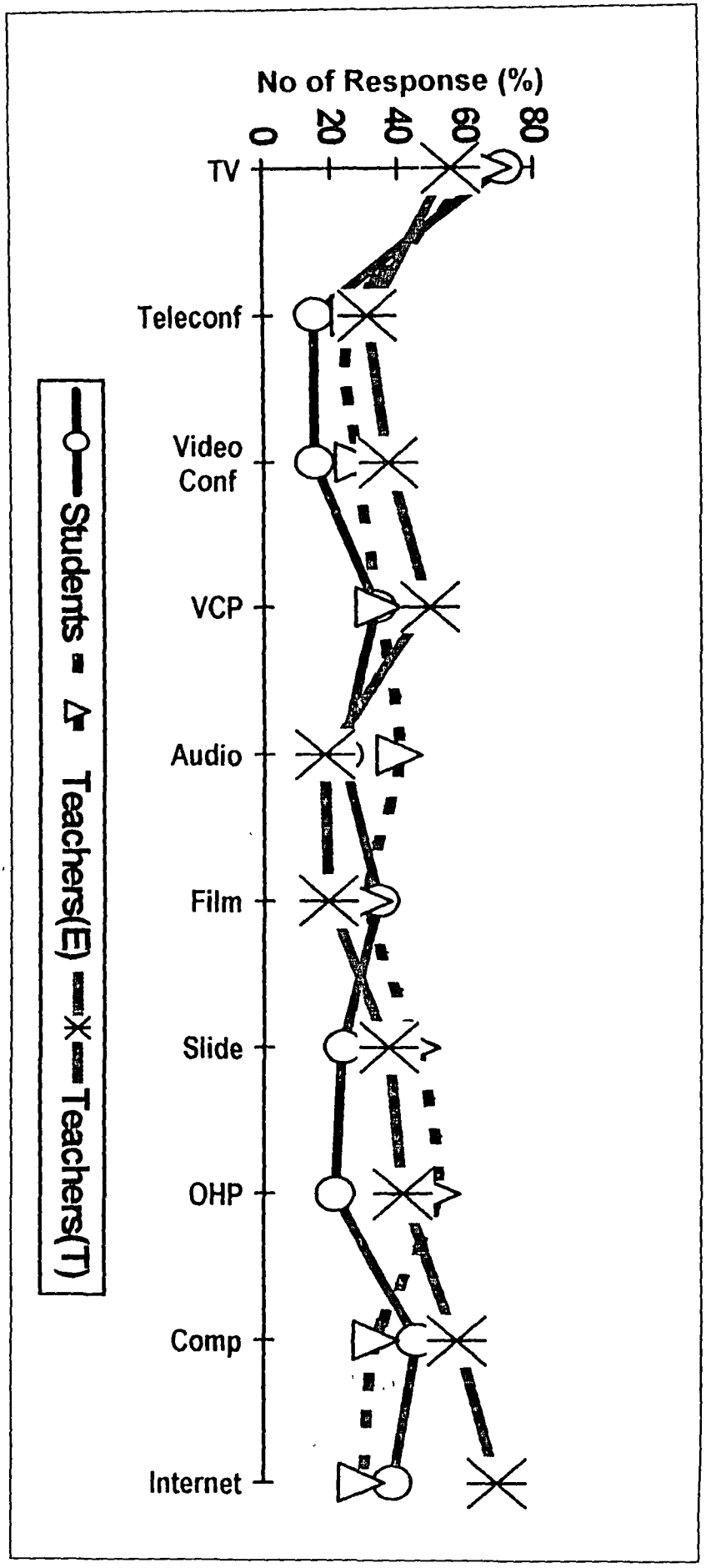


Figure - ^ : *Suitability of Various Technological Aids*

Chapter 5 : Model for Using New Technologies in the ELT Classroom

5.1 Pedagogical Postulates

In our discussion about ESP (see chapter 2.5) we have emphasized the identification of learners needs. In order to design the ESP course for a particular group of learners it is important to analyse the *learner's perceived needs*, which Hutchinson and Waters termed as awareness of the needs (1987). But can we determine or design the ESP or ELT course as per the perceived needs of the learners in an institutionalized system where the syllabus and the instructional materials are rigidly prescribed beforehand ? This study receives an answer to this question in a firm negative.

Holmes (1982) points out that in case of ESP course the main problems are students' experience and availability of time. The students are not sufficiently exposed to their subject books as ESP course are generally offered in the first year of their programme. On the other hand, enough time is not available to master the desired skill to perform in their target language. In our *ET Survey* we have found that these three factors'- rigidity of a pre-determined syllabus, lack of time, and students' experience - are evident in our technical institutions. Thus our attempt

to develop a model for using new educational technology in the ELT classroom is based on a realistic assessment of the constraints of a rigid pre - determined syllabus, limited time and available resources. It is essentially a "skill centered approach" based on the assumptions of communicative language teaching. We have noticed that students have indicated their needs and weakness in respect of use of English in various situations within and outside the classroom.

Irrespective of learning theories and teaching methodologies adopted for ELT, we can not deny the importance of motivation in any language learning classroom. In case of technical institutions, such motivational factors appear to be missing because of the overall apathy of the technical education system towards "Humanities". There is a felt need for better and purposeful use of English in their profession. But, inadequate handling of English syllabus and the absence of any need based modification of the prescribed course have led to a kind of disinterestedness on the part of the learners towards "English" subject as such. The present study has confirmed (*see* Qs. No 13 and 14 above) the presence of such an attitude among the students of technical institutions of Assam. Motivation is therefore, equally important in language learning process and the use of new technologies in ELT is expected to retain the learners' interest in the ELT classroom as well as beyond the classroom so that they can enjoy the process itself with learning. According to Hutchinson and Waters (1987 : 51), "a need to acquire knowledge is a necessary factor, but of equal, if not greater importance, is the need to actually enjoy the process of acquisition."

Based on the above assumptions and keeping in view the constraints of a rigid syllabus, limited resources and non - availability of trained teachers on Educational Technology, a suitable model was developed selecting some prescribed texts to use the available technological aids in the English language classroom. The process is shown in Figure :7. A preliminary try out of the model was conducted before the main experiment (see report in Appendix : H) and the feedback received from the trial was incorporated in the final model developed in this study (see Table : 14).

5.2 Needs Analysis

The foregoing discussion on the pedagogical aspects of developing a 'model' for using new technologies has focused on the learners' perceived 'needs' as the starting point of any 'learner-centred' approach. However, in the prevailing system of course design in technical institutions such an approach is a remote possibility. Because the ELT course designers have already framed the syllabus and prescribed the texts which they thought would serve the purpose of EST. In fact, the latest pedagogic practices prefer a 'learning-centered approach' which takes into consideration the learner's needs at various stages of the design process (Hutchinson and Waters, 1987). But such a process can not be initiated at the institutional level as the courses and syllabuses are designed by the Universities. Therefore, in our model we

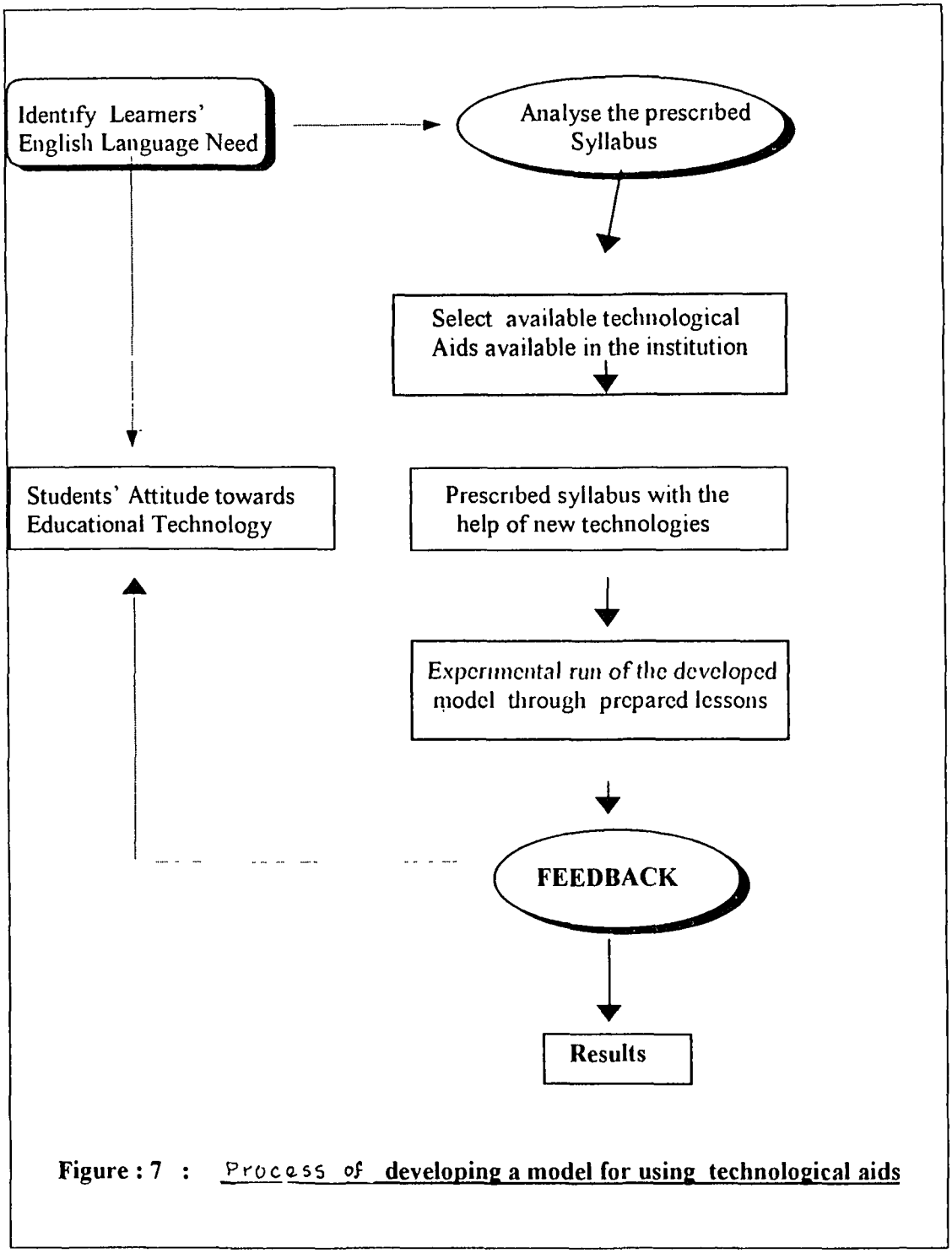


Figure : 7 : Process of **developing a model for using technological aids**

have tried to use the present prescribed syllabus and texts (for REC, Silchar) and design a model in an attempt to fulfil the 'needs' of the learners through some self - instructional aids.

The ET survey conducted as a part of this study and discussed in the previous chapter also identified the areas of weakness and the needs of the learners. As per the expectations of the learners the following skills were found to be very important :

- Speaking
- Writing

The teachers, on other hand, emphasized reading and writing in the language course for the students. On further scrutiny of the specific needs of the learners it was found that they lack adequate vocabulary to express their ideas in verbal interaction (e.g., at the interview) or in written communication (e.g., in the examination). Some of them (21%) also feel hesitant to speak in English due to a self awareness of their poor pronunciation.

Therefore, the *general comprehension* of the prescribed texts with specific aim of developing speaking skill, pronunciation and technical vocabulary in the specialized subject area was taken up for this study. An overview of learners' needs as seen by the students of technical institutions in Assam is presented in Table : 8 .

Background	Learning Style	Language Needs
♦ 6 to 7 years of exposure to English Language (teaching-learning)	♦ Self-study materials / kits ♦ Compulsory English Language Course	♦ Professional Need ♦ Speaking and writing in General within and outside the classrooms. ♦ Pronunciation ♦ Vocabulary

Table : 8 : Students' English Language Needs

5.3 Identifying the Objectives

Within the general 'long-term' aims of ELT and ESP practices, this study has identified a few specific objectives which will guide the progress of the lessons and the use of appropriate technological aids. However, these objectives are not exhaustive and any number of new objectives may be added to the list as per the demand of the learner and as far as possible within the prescribed syllabus. In this study we have just illustrated the model with some specific objectives drawn from our students' response to the ET survey and the English language syllabus prescribed by Assam University, Silchar (INDIA) for the BE programme offered at REC Silchar (Appendix: B). In this study we have dealt with the Part-A (text portion) of the syllabus keeping in view the six texts to be

taught in the class within the limited time and to allow the students to develop the specific skills with the help of new technologies.

The **objectives** of the present model may be enumerated as follows :

1. To teach the prescribed text with an aim to *increase the technical vocabulary and enhance comprehension of the text* with self-access interactive multimedia instructional aids.
2. To encourage supplementary reading on related topics through interactive Multimedia Encyclopedia on Computers.
3. To give pronunciation practice with the help of pronunciation dictionary (Longman / Sound-CD ROM).
4. To correct common errors made by the students with help of Error Correction Dictionary on CD-ROM (Longman).
5. To create situations for conversation practice and develop oral fluency.
6. To develop writing skill with the help of computer-based software.
7. To develop Listening skills with the help of Multimedia Computer and Video clips.

5.4 Designing a Model

A prescribed text as per the University syllabus was selected for the purpose. After that efforts were made to ascertain the types of new technological aids **(TA)** are available in the institute / laboratory which

can be used while teaching that text. While selecting such aids, due attention was paid to the objectives of that particular syllabus and some specific objectives of teaching were set beforehand. In the model illustrated here these objectives are pre-determined and the TAs are presented side by side with a flowing text.

Before the actual classroom use the machines were run, particularly the CD-ROMs and Software to see that the students can really explore those materials without any operational / search difficulty. The illustrated *model* which is presented in the next section, for instance, is tested beforehand to see the effectiveness of the Multimedia CD-ROMs and other aids for transacting the particular text in hand. The process of designing the model is presented in a flow-chart in Table : 8. The process starts with the elementary audio-visual aids like Tape Recorders, OHP, TV, VCP etc. but concentrates largely on the use of 'new technologies' like Multimedia Computational Systems and the latest instructional tools like Interactive Multimedia Dictionary and Encyclopaedia.

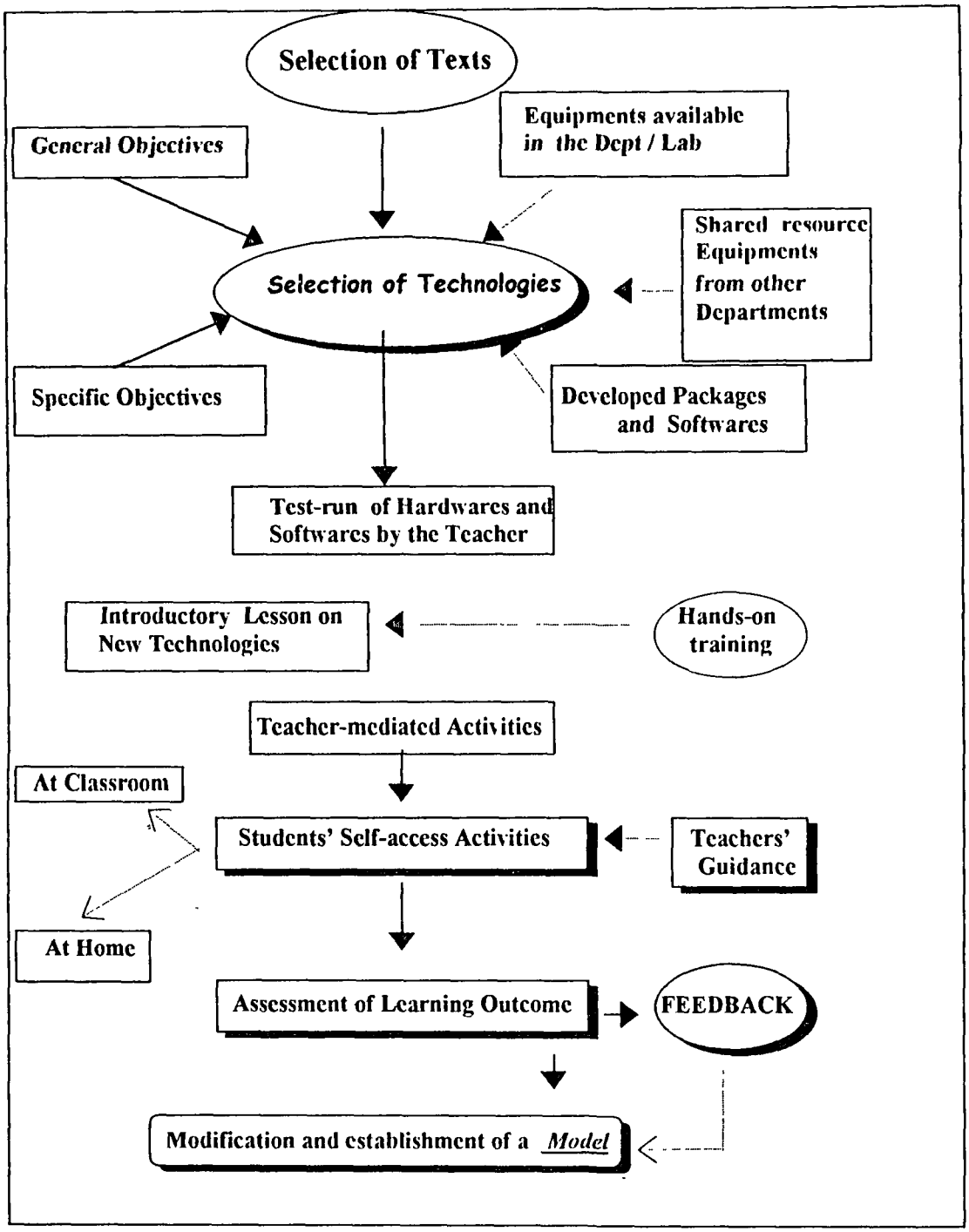


Figure : 8 : Flow-chart for designing a model for using technological aids

5.5 Model Framework

Once we settled down with our general objectives of the course (ie, four language skills) and specific needs expressed by the learners (ie, speaking, vocabulary and pronunciation), we chose the materials to be used in the classrooms. As the texts were already prescribed by University we tried to incorporate materials related to the text. We chose the available technologies and prepared a model framework to use them for achieving the objectives set forth while selecting the hardwares ie, the equipment, we also sifted our available softwares like CD-ROM, transparencies, slides, Video Cassettes, prerecorded audio cassettes, and available TV Programmes etc. The text was then analysed and possible places of intervention where those technological aids can be used are determined. However, those limited interventions cannot be said to be exhaustive as such and it depends on the teacher to prolong the use of a particular aid and to skip through another according to the level of learners' motivation, special needs of the text and even extraneous constrains (eg, electricity failure). Once these aspects were studied and settled, we then proceeded an to prepare a model or framework for classroom implementation. The basic guidelines followed for designing such a model are given by Yalden (1987 : 87) :

1. both the design of the framework and its final product, the language course, should be conducted with as much consolidation as possible with all those involved

2. the framework must necessarily be kept lean, and any tendency to do teacher's work for them should be resisted
3. the framework must be written so that it may be adapted easily
4. the framework should take into account available resources

In the present study we have took up six prescribed texts *(Readings for Technical Students)* and developed such models for the students of BE programme under Assam University, Silchar. The preliminary model for using various aids is presented in Table - 9. Based on this frame work the lesson-plans or 'prototypal units' were prepared in the form of a classroom activities programme for the teachers as well as learners. Though the illustrations given in this study were adopted for BE course of Assam University, Silchar only, similar models can also be developed on the basis of our general overview of the model to utilize the available technological aids in the respective institutions (c.g., a Polytechnic).

5.6 An Illustrative Lesson-plan

An illustrative lesson, which has been developed on the basis of model framework designed in this study, is presented in this chapter. In our teaching experiment we prepared altogether six such lessons on the basis of texts prescribed by the Assam University, Silchar (Appendix : I). **Abbreviations** used in these lesson-plans are as follows :

New Technologies Available	Abbreviations Used
1. Over head Projector	OHP
2. Slide Projector	SP
3. Television	TV
4. Video Cassette Recorder	VCR
5. Computer based Instructional Aids	
a. Multimedia Interactive Dictionary on CD-ROM	MMC/IDC
b. Multimedia Encyclopedia on CD-ROM	MEC
c. Common Error Dictionary on CD-ROM	CEC
d. Pronunciation (Multimedia) Dictionary on CD-ROM	PDC
	EGC
e. Longman English Grammar on CD-Rom	PIC
f. Longman Picture Dictionary	CUL
g. Cambridge University ELT software	THR
h. Thesaurus on CD ROM	TR
6. Tape Recorder	

ALL TEXTS	Skills Attended ↓	Technologies Used						
		OHP	**Slide Projector**	**TV**	**Video (VCP)**	**Computer**	**Multimedia Comp**	**Audio Cassette**
	A. General Objectives							
	Speaking		Motivation Discussion		Speaking Manners Body Language		Situational Use of Language	
	Writing				Predicting & Writing Gist	Story Building Fill up Blanks Justifying logic	Describing Technical Topics	Writing Answers Organising Text Technical Report - Assignments
	Reading	Reading the text		Reading Graphics Titles Directions *		Reading Instructions	Reading Instructions Hypertext Serfing	
	Listening	Guided Note Taking		Listening to Native Speakers / different accents	Note Taking Describing Technical Topics / programmes themes		Listening to original speakers for variety of accents & dialects**	Listening to lectures on topics related to the text for comprehension.
	B. Specific Objectives (learners' Preference)							
	Vocabulary					Contextual Meaning	Hypertext serfing	
	Pronunciation			Exposure to BBC Pronunciation Oral Practice Support	Listening to native speaker in the cultural context		BBC Pronunciation Practice Accent Modulation through Computer Voice-graph Indicator	Practice by Recording & Comparing
	* also involves Skimming, Comprehension, Guessing meaning				** Eg J F Kennedy, Ben Kingsley, Michael Douglus (from *Infopedia*, *All Movie Guide* CDROMs)			

Table : 9 : **PRELIMINARY MODEL FOR USING NEW TECHNOLOGIES IN ELT CLASSROOM**

MODEL LESSON : 01

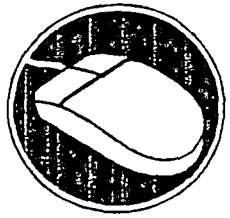
Lesson No : 01 **TEXT : 01** **TITLE : *Science : Its Use & Approach*** **Discourse Type : Descriptive & Argumentative** ***(Text Book Courtesy : McMillan India Ltd.)***	**Course : BE. level : 1st Semester,** **Time : Classroom : 4 Hrs** **Lab / Home : 10 hrs** **Total : 13 hrs (Approx)**

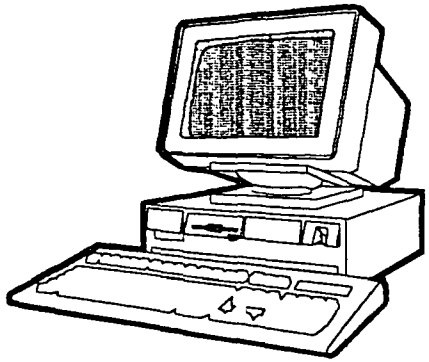
Objectives

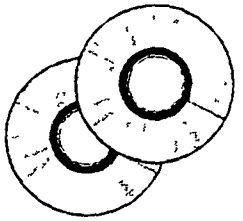
1. To teach the prescribed text with an aim to *increase the technical vocabulary and enhance comprehension of the text* with self-access interactive multimedia instructional aids.
2. To encourage supplementary reading on related topics through interactive Multimedia Encyclopedia on Computers.
3. To give pronunciation practice with the help of pronunciation dictionary (Longman / Pronunciation CD ROM).
4. To correct common error made by the students with help of Error Correction Dictionary on CD-ROM (Longman).
5. To create situation for cenversation practice and oral fluency.
6. To develop writing skill with the help of computer-based softwares.
7. To develop Listening skills with the help of Multimediia Computer & Video clips.

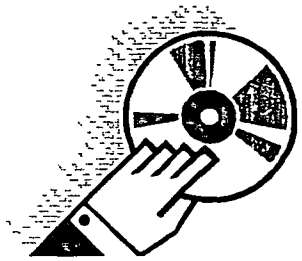
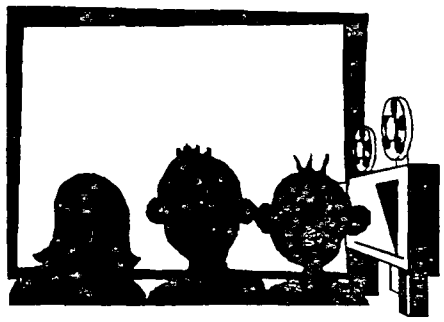
Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
Text 01 / Para 01 **Science : Its Use & Approach** Science, which tries to find out the way in which all things, living and not living, work, helps us by means of this knowledge to do things better and more efficiently. It helps us to make engines and all kind of machines, which add to our comfort and lessen the labour required to manufacture things, so that they become cheaper : think of steam engines, cheap printing machines, cold storage of food, and electric light. It helps us to grow crops : think of improved seeds, and cheap artificial manures. It keeps our cities healthy and fights disease : think of disinfectants and X-rays.	**The intial preparation is done through a short slide show based on the text content.** The teacher asks the pupils to read the paragraph, displayed on the OHP for simultaneous reading of the whole group, and highlight / enlist the difficult words which they do not understand. The teacher also helps the students in noting the main theme of the text.	**< SP** **< OHP**		Motivation Reading Writing Guided Note-taking

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
It looks after the safety of our sailors at sea : think of wireless telegraphy. But, quite apart from all these things of practical use, it makes things much more interesting for us if we can get some little idea of the reason for puzzling happenings, and can account for some of the wonderful ways of things which we may notice if we keep our eyes open. The boy or girl who knows nothing of science is like someone on a steamboat who just sits on deck, and goes to sleep between meals. The boy or girl who knows something of science is like someone who has had a look round the engine-room, understands how the compass is read, and has found out a little about the steering wheel and the rudder.		**MMC** **IDC &** **PDC >**	Students search for the meaning of the difficult words & refers to many other words which are related to the topic and comes up as marked lateral reference to the words searched for. **Dictionary Meaning & Pronunciation (RP)** Manures, Disinfect, Puzzling, Destination, Bowl, Disgusted, Offensive	Compre-hension Knowledge Pronuncia-tion

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
He or she knows something of the way in which the whole ship is driven and guided to her destination, and has something to make the whole voyage interesting. Of course the wise traveler will also enjoy the waves and the wind and the starlit skies at night, and that reminds us the there are other things in life than science, and then the best of all is to be interested in everything, and notice all we can, beautiful things and useful things and human and moral things together. who was giving his first lesson to young men who were going to be doctors. He said to them that if they wanted to become good doctors there were two things most important for them : one was to observe well	A grammer software / Testing Programme is run to initiate the interaction between computers & students (*CUP Languae Software*) Scores are noted & the students are left to analyse their answers as indicated by the computer & detect their problems. Grammar Dictionary in Multimedia is also referred to see the Conjugation of Verbs	**CUL>** **EGC >**	 Students run the Cambridge University ELT Software in Explorative Test Mode & gets the answeres / response from the computer and corrects their own answers as they proceed through the software. They also read the necessary instructions from the Computer Help File. **Grammar / Conjugation of Verbs** Puzzle Disgust	Knowledge Writing Reading

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
and carefully, and the other was not to be disgusted at unpleasant things. In front of him was a bowl of dirty dishwater, with an offensive smell, and he went on to say that, to test them, he was going to put a finger first in the water and then in the mouth, and that he wanted them all to do after him exactly what he did. Accordingly, he dipped in a finger, and then put a finger in his mouth. In spite of the unpleasantness of the water, the students came up one by one, and put a finger in the water and them in the mouth. At the end of it all the professor said : "I must congratulate you, gentlemen, on all having one of the qualities necessary, but one alone. (Contd.....)	**The teacher** then asks the students to refer to Multimedia Encyclopedia and search the words selected by them or any other idea / concept which they feel interested about. 	**PIC>**	**Picture association of words:** Bowl **The students** run the *Infopedia* Encyclopedia and refer to the following words & other related information. • NB : Each of these items will again lead to other references in the Encyclopedia and as such it is a learner-centred activity with limitless possibility of exploration.	Vocab.
		MMC **MEC>**	**Machine** Force, Engine, Machine Tools, Drill, Grinding & Polishing	Vocab.

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
(contd from pre-page) You do not let horrible things disgust you but neither, unfortunately, do you observe carefully, or you would have noticed that, whereas I put my second finger in water, it was the third finger that you put in my mouth." Let this story serve to remind us of the importance of noticing what really happens, and not what we think is going to happen. (Concluded)	**Testing** Then the teacher takes a test verbal as well as on computer software & collects the feedback from computer scoring.  	**TH>** **MEC >**	**Disinfect, Steamboat** Ship & Shipbuilding, Vessels, Sails & sailing , Air Cushion vehicle, Submarine etc. 	Vocab.

Follow up	As the emphasis of this model is on 'self-access' learning tools, the teacher will provide sufficient materials for students' own practice. Some of the examples are as follows:	**<TR**	Listening Pronuncia-tion Practice
	a. The teacher will give the students a pre-recorded audio-cassette for listening practice in their own leisure hour & answering some questions based on the audio-tape d. The students are also asked to serf through the multimedia CD ROM to know more about the topic and write an essay on what should be their attitude towards science c. The teacher also suggests some Video film on Science & related topics and asks the student to discuss the main theme of the Video Programme.	**< TR** **< IDC** **VCR>**	Practice by Recording & Comparing 

5.7 Experimentation

In case of Educational Technology and related instructional courseware development the response and feedback from the learners become very important for further refinement of the designed materials. Educational researchers and practitioners have, therefore, considered such feedback responses rather seriously as an integral part of the developmental stage of any instructional material. Pre and post-test results were utilized as the formative evaluation tools, and they yield valuable information during field trial (Blin and Wilson, 19940. Chinien and Hlynka (1993) point out three main aspects of any such evaluation viz, content, technical quality and learnability. However, language tests are differentiated on the basis of the purposes they serve in the instructional process or as per the use of the assessment results. Baker (1989) distinguishes between Placement Tests and Progress Tests as follows :

Placement Tests	For decision whether the student should go to next level
Progress Tests	For decision about the methodology and syllabus

Similarly, Hughers (1989) differentiates between the following:

Proficiency Test	To measure learners' ability in a language
Achievement Test	To measure learner's success in achieving the course objective

Romiszowski (1990) however highlighted the importance of 'prerequisite tests' to ensure the entry qualification of the learner before entering the pre-test.

Another aspect of learner-centered language learning is the involvement of learners in the assessment process. Therefore self-assessment results, specially through computer mediated tests can help the learners to become more autonomous in their learning. At the same time reliability and validity of the tests are to be strictly ensured before we base our decisions on the results of such tests, Limitations of particular computer authoring tools may create some additional difficulty in retaining the validity of such tests (Blin and Wilson, 1994)

Based on these theoretical assumptions as discussed above an experiment was designed and conducted at REC, Silchar to test the effectiveness of the developed model discussed in the previous sectionss and to modify the model if necessary. The experiment was aimed at examining the effects of the use of new technologies as per the designed model lesson-plans on the learners in comparison with their equal counterparts who studied the same content according to the traditional classroom lecture method. The specific objectives of the experiment can be enumerated as follows –

- Is there any general improvement of the participants level of achievement in their English language programme ?

- Are the technology-aided ELT classes are more effective than traditional lecture-based classes ?
- Is there any shortcoming in the developed model ? If there is, how they can be addressed?
- Can the existing syllabus content be successfully executed through the use of the new-technologies without altering the total syllabus content ?
- Whether any kind of change is necessary to modify the existing English language in order to cater for the learners needs and to ensure the use of new technologies.

For this experiment 100 students were selected from the BE 1st semester (1997-98) through a carefully constructed diagnostic lest. Half of them were randomly put into the **Control Group** and the rest constituted the **Experimental Group.** Both the groups used the prescribed texts from *Readings for Technical Students.* The experiment and it results are discussed in detail in the following sections.

5.8 Participants

India produces the largest number of technical manpower today. Every year hundreds of thousands of University graduates enter the professional world of science and technology serving in academic and research institutions, government departments, corporate houses and industries. Having studied English as a subject for more than 10 years or so since their middle school through their 10+2 level and college, these

graduates are expected to be proficient in the use of English language. However, in reality they are mostly weak in listening and speaking. Year of compulsory English courses have made many of them good readers and even writers in the language but it is difficult for them to follow English speakers or to express their ideas properly in English. With India entering the global market it needs more and more English-speaking engineering professionals to facilitate the economic growth of this country. Our budding engineering graduates now feel the pressure, as our survey showed, and they are eager to improve their English. However, they want it through more dynamic and effective ways which are qualitatively superior to the prevailing courses of Indian graduate schools.

The students of Regional Engineering College, Silchar are selected through a very rigorous entrance test. Though the entrance test in conducted on the science subjects only the average aggregate percentage of marks obtained by the admitted students in their senior school level examination always remains much above the first division marks (60%). Therefore, the students can be considered to have already attained an average level of proficiency in English. However, taking into account our theoretical assumptions about ensuring minimum pre-requisite qualification level in English and also to see that the selected participants (samples) are of a similar English language ability a diagnostic test was administered. The test was designed selecting the participants for the proposed experiment. The test was first conducted

among a few randomly selected first year students with a view to getting feedback on their response to the test-design. Based on the feedback the test design was finalized and the same was administered to 200 first semester BE students of the 1997-98 batch. The test was designed to test the participants' English language ability in all the four skills – listening, speaking, reading and writing. The test pattern was more or less on the line of TOFEL and it lasted for an hour.

The score pattern was analysed *(see Table : 10)* and a sample of 104 students were selected from the medium level score-group. Again these 104 students were *randomly* put into two groups of 52 students each viz., **Experimental Group** and **Control Group.** However, after the the programme had started 4 students left the institution on transfer and both the group had 50 students each.

5.9 Tools

As indicated earlier the pre-experimental diagnostic test was conducted with the help of a TOFEL – type skill-oriented language test constructed on the basis of a pilot-test. Moreover, the Cambridge University First Certificate Examination Software developed by Christopher Jones et. Al was also utilized. The validity and reliability of the test were also verified through more than one measure including the pilot-test. The researcher checked whether each test item matched the objective for that particular item.

Score (in %)	No of Students	Selection Result
50 and above	13	Total Participants : 203
46 - 50	20	Selected students: 47+57=104
41 - 45	29	Dropped during Experiment = 4
36 - 40	47	Total participants in the Experiment = 100
30 - 35	57	***Experimental Group = 50***
below 30	34	***Control Group = 50***

Table :10 : *Score-Pattern in the Diagnostic Test*

The exit test or post-experimental test questions were also designed after strict scrutiny in terms of validity and reliability. The questions were drawn from a question bank of TOEFL examination conducted by the Educational Testing Service, Princeton, USA (Appendix-J). However, the emphasis was more on vocabulary and comprehension as per the general objectives of the prescribed syllabus for English. But all the language skills were covered in the test and it lasted for 1 hour. The exit-test was domain-referenced or content specific so as to cover the content domains (texts) that were handled during the experiment. To test the speaking skills of the participants, the researcher during both pre-and post-tests conducted group-discussion tests. Similarly, as special audiocassette was recorded and prepared on the syllabus content for conducting listening tests.

5.9 Equipment

The Audio-Visual and Multimedia Instruction Laboratory of REC, Silchar provided the equipment for the experiment. The following tools (Hardware and Software) were available:

1. TV
2. Video Cassette Player
3. Satellite Receiver (Dish Antenna)
4. Slide Projector
5. Over Head Projector
6. Multimedia Computer Pentium with CD ROM Drive and accessories
7. Multimedia Computer 486 Multimedia with CD ROM Drive and accessories
8. Computer Software / Packages on ELT
   a. University of Cambridge Local Exam. Syndicate First Certificate Exam. Software – A
   b. University of Cambridge Local Exam. Syndicate First Certificate Exam. Software – B
   c. Cambridge ELT Software : Grammar Games
   d. Longman Multimedia Interactive Dictionary on CD-ROM
   e. Senior School English : Europress
   f. Public Speaking : Pro One Software
   g. English : Grammar, Vocabulary, Composition ; Pro One Software
   h. English Master- Vocabulary, Grammar, Spelling, Composition : Super Tutor Co, 1996-98
9. Multimedia Supporting Software Corel CD

a. Encarta Encyclopedia 1998 : Microsoft Corpn, USA

b. Infopedia : The reference Tool on CD-ROM

c. All Movie Guide

d. Learning Vin'95

e. Bible Reference Tool

f. Barrons' Study Notes

The above mentioned equipment and related software were used to teach the experimental group as per the model lessons resented in the previous chapter (*see* Section 5.6).

5.11 Treatment

The first semester classes in the BE program starts in August and it continues upto January next year. But, out of these six months initial days are often wasted due to prolonged admission procedures. Moreover, some of the students from various states joined the program a bit late. In fact, the actual teaching period for the 1st semester class comes to about 3 months and as such around 30 class hours were available for this ELT classroom experiment. However, during the initial days of the semester when the first phase of admission was over the time was utilized for materials testing and development, equipment preparation, less on pan building, hardware and software gathering and other procedural works for the experiment. In that sense, the initial delay in the commencement

of the classes was fruitfully utilized. The works for the entire period of six month semester was planned as follows:

Activities ↓	Aug 1997	Sept 1997	Oct 1997	Nov 1997	Dec 1997	Jan 1997	Feb 1997
Lesson Plans and syllabus content Analysis							
Pre-Test and Tech. Familiarisation							
Preliminary Model (Vacation)							
Text 1 and 2							
Text 3 and 4							
Text 4 and 5							
Post test and result Analysis							
Model Finalisation							

TABLE : 11 : TIME-PLAN OF THE ELT EXPERIMENT

During the first one month of the semester when the College processed the admissions the existing syllabus was analysed thoroughly in terms of its objectives and contents. Keeping in view the felt needs of the learners (as formed during our survey), preliminary lesson-plans were prepared for the six prescribed texts in the line of the illustrative lesson-plan given in the previous chapter. The lesson plans were prepared with utmost care to pay equal attention to syllabus content, learners' needs, judicious use of available technologies – hardware and software and the time constraints of the English language class. The students were

distributed as per their branches of studies like Civil, Mechanical, and Electrical etc. and as such they were again redistributed in experimental and control groups.

After the pretest and selection of participants for the experiment a brief phase of technology familiarisation was started with a view to making the participants feel at home with the newly set-up technologies in the classroom as well as in the Audio-Visual and Multimedia Instruction system. This phase of technology orientation was also used to identify specific problems and strategies for the execution of the model lesson plans.

The detailed step by-step illustrated lesson plans on the prescribed texts were further developed and a preliminary model for the whole semester was designed during the vacation which came just after the pre-test and the familiarisation phase. During the vacation the complete set of lesson plan was rescrutinised and kept ready for execution from day one after the reopening of the college. The classrooms were also made ready with necessary electrical fitting wherever needed. The software were test-driven and some backup copies were also prepared in case of data damage by the participants. Slides and transparencies were also prepared during this phase. The printed text book was not available in the market as it was out of print for a long time. Therefore, a few spare photocopies of the texts were also prepared.

The texts were executed as per the lesson plans. Each of the text was allotted 4-5 classroom hours depending on the length of the texts. But the classroom lessons were followed by controlled sessions of exercises based on the principles and strategies introduced in the class with a view to giving the learners more autonomy in learning through the use of new technologies. The distribution of language skills and technologies used was balanced in such a way as to do maximum justice to the course contents i.e., the texts. It was always kept in mind that the students would ultimately take the final examinations of the University (see question papers in Appendix – D).

The illustrative lesson plan (Section 5.6) was first taken up. Meanwhile, the control group was attending the conventional lecture based English Classes. At the beginning there was an air of confusion among the students regarding the grouping and selection placement as well as the syllabus contents. But, after the introductory explanation the experimental class became a very interesting exercise with lots of interaction on various aspects of language items. Learner specific needs of particular skills were also attended through self-access materials like language learning CD-ROM on Communication.

The students of the experimental group were allowed to use Multimedia Computers with ELT software, Multimedia Dictionaries

(*Longman Interactive Multimedia Dictionary*, 1993) and Encyclopedia (*Infopedia*, Multimedia Reference Tool, 1995) beyond class hours. The Multimedia Laboratory at REC was made accessible to students of the experimental group throughout the day on self access basis. Preliminary instructions to run various software were given to the subjects in the beginning so that they could use the computers themselves. Besides this, a pre-recorded audiocassette containing textual lectures by the teacher was given to each of the students for repeated listening. Such facilities were not available to the control group and they were exposed to conventional teaching only.

In the process of teaching with new technologies the participants developed an ability to navigate through the software and language resources. The specific skills were given extra attention for the benefit of particular participants. Thus the use of multimedia computer-based language learning tools were explored vigorously for the ELT / CALL purposes. Some basic issues were also identified to see the suitability of the ELT software :

- Syllabus-relevance
- User-friendliness
- Interactivity
- Formative evaluation of learners' progress
- Skill-based tasks
- Classroom and societal contexts
- Assessment and learner feedback

After the completion of each text feedback was collected from the participants and necessary modifications were incorporated in the subsequent lesson-plans. In this way, the model lesson plans were constantly improved during the experiment. In this way, the six texts were taught during a period of 3 months utilising the allotted classroom hours. The progress of the classes were recorded in a journal alongwith other necessary students' attendance formalities as required by the University administration.

During the experiment it was noticed that in respect of teaching learning interaction the two groups differed from each other in the following ways –

1. In control group it was teacher centered where the teacher gave routine lectures followed by some exercises for the participants. For completing those exercises there was no support system available for the participants. In the experimental group the teachers' presentations were followed by participants' individual and teamwork supported by technology-aided language learning tools. The participants negotiated the exercises at their own pace.

2. Technology-based team work in the experimental group ensured a more close interaction and creased opportunity for the participants. On the other hand the control group participants had a limited chance to raise individual questions and issues during the class.

5.12 Test Scores and Statistical Analysis

At the end of teaching term both the groups of students were asked to take an ***exit test*** on comprehension and vocabulary based on the six taught texts. The test carried 50 marks and all the students were asked to answer the same set of questions. Through a pre-experimental try-out the time limit for the test was set to be one hour. As discussed earlier, though a number of problem areas in terms 'needs' and 'weaknesses' were identified through the ET survey, for the purpose of this experiment *comprehension of the prescribed text* and *vocabulary teaching* were emphasized keeping in view the syllabus design and University examination system prevailing at the time of the experiment.

	Mean Score	**Standard Deviation**	**z- ratio**	**Table Value of z at 0.01 level**
Control Group	27.08	4.57	**26.94****	2.68
Experimental Group	47.56	3.08		
** Highly significant at 0.01 level.				

Table : 12 : Students' Performance in the Exit Test

Since the z-ratio for the difference between the performance of the control and experimental group is highly significant, it is safely concluded that the new model for the use of technologies in English language classroom was effective in terms of learners' comprehension and vocabulary skills.

5.13 Repeat Experiment

As we have discussed earlier any pedagogical model should be valid and reliable as far as its universal use and replicability are concerned. The present study not only tried to know the needs and attitude of the learners of English language but also tried to provide an illustrative model for using new technologies in the ELT classroom. The designed model lesson-plans and the overall strategies were found to be significantly effective in improving the teaching-learning situation during our field experiment described in the preceding paragraphs. However, any such model should be tested more than once to be sure about its reliability. Therefore, after the successful completion of the first experiment, the same model was again implemented through a new syllabus which was designed according to the responses received during the present study. The University (Assam University, Silchar) adopted the newly designed syllabus and the same was taught in REC, Silchar from the academic session 1998-99.

The salient features of the new syllabus were as follows-

- It was prepared as per the felt language needs of the learners.
- It was more technology friendly as most of the component of the syllabus could be administered through computers and other aids.
- The syllabus retained some of the conventional texts-based units while accommodating all new components to cater to the needs of the users of English for specific purposes (ESP).

During the repeat experiment process, again the selected participants from a similar language ability level were placed in two groups of 50 students each – control group and experimental group. The syllabus was executed among the participants of the experimental group using the available new technologies whereas the control group continued to be taught the same syllabus as per the conventional practice of lecture method. The repeat experiment process was further facilitated by the presence of a senior group of students who participated in our earlier experiment. The new batch of participants was often helped by their seniors and as such the initial confusions of the first experiment were not there this time. As per our model-plan (Table:14) fresh lesson plans were prepared and used this time also and the exit test showed a phenomenal increase in participants language ability compared to that of the control group. The participants' performance in the exit test are statistically presented in Table: 13.

	Mean Score	**Standard Deviation**	**z- ratio**	**Table Value of z at 0.01 level**
Control Group	20.84	6.72	**9.50****	2.68
Experimental Group	31.86	4.83		
** Highly significant at 0.01 level.				

Table : 13 : Students' Performance in the Exit Test (Re-experiment)

5.14 Summing Up

In this chapter we have started with some basic theoretical assumptions about the importance of need analysis in language learning. Then we proceeded on to identify our specific objectives towards developing a model for using new technologies in the ELT classroom. We constructed a model framework wherein we have distributed the use of new technologies against various language skills which are to be attended to in our language programme. On the basis of this framework we went on to develop some preliminary lesson-plans which were tested through a experiment at Regional Engineering College, Silchar. The exit test score of the experiment has indicated a very positive effect of the use of the technological aids in ELT class. The experiment has also proved the effectiveness of the model which was further revised on the basis of experiment feedback. The reliability of the model was again tested through another experiment among the next batch of students. It was found that the systematic use of new technologies as an intervention strategy for the ELT syllabus was very much fruitful and effective.

The experiment yielded results which confirm our hypotheses. These are –

- There is enough scope for using new technologies in our ELT programmes.

- There are a number of technological aids in our technical institutions which may be utilised judiciously for the benefit of English language students in these institutions.
- A suitable model for classroom strategy can be designed in order to use the new technologies in a systematic manner (see Table : 14).

ALL TEXTS	Skills Attended ↓	Technologies Used						
		OHP	Slide Projector	TV	Video (VCP)	Computer	Multimedia Comp	Audio Cassette
	A. General Objectives							
	Speaking		Motivation Discussion		Speaking Manners Body Language		Situational Use of Language	
	Writing				Predicting & Writing Gist	Story Building Fill up Blanks Justifying logic	Describing Technical Topics	Writing Answers Organising Text Technical Report - Assignments
	Reading	Reading the text		Reading Graphics Titles Directions *		Reading Instructions	Reading Instructions Hypertext Serfing	
	Listening	Guided Note Taking		Listening to Native Speakers / different accents	Note Taking Describing Technical Topics / programmes themes		Listening to original speakers for variety of accents & dialects**	Listening to lectures on topics related to the text for comprehension.
	B. Specific Objectives (learners' Preference)							
	Vocabulary					Contextual Meaning	Hypertext serfing	
	Pronunciation			Exposure to BBC Pronunciation Oral Practice Support	Listening to native speaker in the cultural context		BBC Pronunciation Practice Accent Modulation through Computer Voice-graph Indicator	Practice by Recording & Comparing
	* also involves Skimming, Comprehension, Guessing meaning				** Eg. J F Kennedy, Ben Kingsley, Michael Douglus (from *Infopedia*, *All Movie Guide* CDROMs)			

Table : 14 : FINAL MODEL FOR USING NEW TECHNOLOGIES IN ELT CLASSROOM

Chapter 6 : Conclusion

6.1 Recapitulation

Let us now summarize the foregoing discussions and findings. We started with the assumption that the role of English language is unquestionable in technical education. A review of special branches of ELT like ESP and EST has shown that enormous work has been done by the linguists and teachers all over the world. Various language learning theories and approaches have also offered support to the ELT practitioner. But the prevalent ELT programmes have not received enough attention in the technical institutions, and the English language teacher is virtually crippled by the limited class hours allotted to him. Though the need of English language ability is strongly felt by the students for their academic as well as professional career, the English language class poses a difficult problem in time management.

In course of the Educational Technology survey conducted during this study, students have once again reiterated their English language needs for successful career and felt that the lack of proficiency in English is a disadvantage for them. They wanted to devote some extra time to the learning of English and looked for some self-access learning programmes. Speaking and writing were their marked priorities. To resolve this crisis

in demand and supply the potential help of new technologies in English language classroom was suggested and the students have supported the idea. Teachers have also corroborated the view and asserted that the students can benefit a lot from the use of technological aids in the ELT classroom. But they stressed on the importance of developing a model for such use and also for adequate teacher training in handling of these technologies. The study revealed that the teaching technologies ranging from OHP to Multimedia Computers and Internet are available in technical institutions but Humanities faculty in general could not use them or take advantage of such resources mainly due to administrative, motivational and to some extent, financial problems. Even limited exposure to some of the language software packages has made many teachers interested in using these materials in their own institutions.

Taking a cue from the positive response from the students and the teachers, a model was developed for using the available technologies in the English language classroom (Chapter 5,Table 14). The model was further supported by some concrete lesson-plans, which were used for experimental teaching at Regional Engineering College, Silchar. The model was aimed at using new technologies under the existing syllabus but attending to learners' needs and preferences. However, the learners have expressed great dissatisfaction over the existing English syllabuses. It was observed during the course of the experiment that for adopting the new technologies more suitably the present syllabus has to be more techno-sensitive or machine-friendly. The technologies used in the

experiment focused on comprehension of the prescribed texts and vocabulary building. The results of the experiment were highly encouraging. The average score of the experimental group was much higher than the control group. The z-ratio for the difference of means of scores of the students in the exit test was highly significant at 0.01 level. Students were highly motivated and without any pressure on the allotted classroom hours, their language learning activities through interactive multimedia computers and other aids extended up to 15 hours a week as against stipulated 4 hours per week for the English class. Students were more involved, and the process of teaching-learning was more interesting than the one that usually prevails in our 'Humanities' classroom in the technical institutions.

The foregoing discussion shows that the hypotheses formulated for this study (*see* Chapter 1, Sec: 1.3) have been confirmed by the survey data and the experiment results. In the following paragraphs we will now present the concrete findings of this study.

6.2 Scope for using new technologies

6.2.1 There is sufficient scope of using new technologies for English Language Teaching in the technical institutions in Assam. There exist a large number of departmental and shared institutional resources

that can be utilised by the language teacher for better execution of the language teaching programmes.

6.2.2 A suitable model can be developed and adopted for using the new technologies in a systematic and pragmatic manner keeping in view the learners' needs, available technologies and the prescribed syllabus. Illustrative lesson-plans must follow such a model for actual classroom implementation.

6.2.3 The students' comprehension of English language texts is greatly enhanced by the use of self-access learning aids besides normal classroom hours. It demands no extra time on the part of the language teacher because except the initial setup/instructions about the computer and occasional consultations, the teachers do not have to interfere with the self-learning process with the help of these aids.

6.2.4 Students' understanding of the texts was better when they took the help of Multimedia Dictionaries, and repeated listening of recorded instructions helped them to recapitulate the teacher's lecture more promptly. Hours of interaction with Multimedia Encyclopedia (Infopedia. 1995) significantly increased their level of understanding compared to the level achieved by the control group.

6.2.5 Students spent more time in interaction with the computer than the class hours, and this period of interaction increases with the

passage of time as they grew more accustomed with computer operations.

6.2.6 Students improved their vocabulary through multimedia surfing. They understood the language better through a number of multimedia tools like Dictionary, Grammar software, Thesaurus, *Encyclopaedia, Atlas etc. in a lively environment of sound, photographs,* maps and texts etc.

6.2.7 Another major aspect of language learning viz., Grammar Practice can also be handled successfully by utilising specialised grammar games software as an additional boost up against monotonous sessions with computers.

6.3 Attitude of teachers and students towards new technologies

6.3.1 Teachers and students of technical institutions in Assam are interested in using new technologies to enhance the effectiveness of English language programmes.

6.3.2 Students prefer the new technologies as self-access language learning aids to the conventional instructional materials.

6.3.3 The conventional teaching aids like OHP, Slide Projector and VCP etc. are still popular among the English language teachers.

However, both teachers and students are very much enthusiastic about the use of new technologies.

6.3.4 There is a tremendous increase in motivation and interest among the teachers and the students to know the new technologies like Multimedia Computers and Internet because of extensive mass media coverage given to the emerging information era.

6.3.5 The teachers of English under the Humanities Departments in technical institutions of Assam feel that though the new technologies have arrived their institutions, those are out of their reach. They felt that the lack of proper training and absence of any orientation on the latest practices of CALL and CAI have made them 'technology-blind' to their colleagues and employers.

6.3.6 Educational Technology is a thrust area for financial support in technical institutions. And some teachers have utilised the scheme to advance new systems and CALL laboratories. The REC Silchar has done some pioneering works in this area.

6.4 Further Research

6.4.1 Though a sensible synthesis of new technology and existing syllabus has shown very significant positive results, it has been found during the experiment that the conventional anthology-type text-based

syllabuses are not sufficiently favourable for extensive use of these technologies. To exploit the full potentials of the new technologies suitably designed syllabuses and texts should be developed by modifying the existing ones. Therefore the existing English syllabus of technical institutions should be studied further and necessary changes in the syllabuses may be initiated taking the following into account :

i) Present day communication needs of the learners.

ii) Occupational needs of the learners.

iii) Adoption of new technologies like CAI / CALL in ELT pedagogy

iv) Placement and career needs of the learners.

6.4.2 The present study focused on the exploration of the possible role and in the availability of necessary technologies in ELT classrooms of technical institutions in Assam. However, it is strongly felt that with the help of user-friendly multimedia authoring tools more need-based syllabus-specific software and CAI packages can be developed.

6.4.3 Various other aspects of language learning like specific language skills and their use have not been covered here in details due to the limitations of this study. Further researches can explore these possibilities and try-out innovative techniques for using new technologies for those purposes in Indian situation. Advanced studies and software development ventures in other parts of the world, specially in the Western countries, have already taken a lead in integrating new

technologies and higher studies in Humanities. India can not afford to lag behind any more.

6.5 Epilogue

As discussed earlier Assam University, Silchar, formally adopted a new syllabus that has been designed during this study for ESP course in the 1st Semester BE programme from the academic session 1998-99. The Government of India has also sanctioned necessary budget for preparing a special language classroom with all the new technologies including Internet facility and a number of computer terminals linked to a server for the classroom. Now the students have not only a free access to the ELT software and resources but also a cyber-link with the developments of the ELT in the rest of the world. The new cyber-linked computer-network-based ELT classroom will be connected to a number of ELT research centres of the world through internet for ongoing language teaching-learning collaboration and consultation. At the first stage, the Centre for Language and Educational Technology, **Asian Institute of Technology, Thailand** and the **Yarmouk University, Jordan** will be linked to this network. While the involvement of the technologies in the traditional (ELT) classroom set-up has witnessed enthusiasm, during the course of this study we noticed the growing interest of the learners in discovering the 'joy of learning' in language learning in a so-called 'compulsory English' class. Perhaps this is the most rewarding aspect of this study.

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APPENDICES

APPENDIX : A

English Syllabus of Indian Institute of Technology, Guwahati

HSS Electives

HSS 101 English Class Hours : 3 - 0 - 0 6

The course in divided into three parts :

A Grammer B. Composition C. Literature appreciation

Total No. of lectures = 40

Grammer :

(I) Tenses (ii) Singular & Plural (iii) Rules of syntax (iv) Sentences & their transformation (v) Use of Preposition - 15 lectures

Composition :

(I) Precis (ii) Comprehension (iii) Vocabulary - Phrases & Idioms ; Antonyms and Synonyms; writing of technical reports - 13 lectures.

Literary appreciation :

How to read a poem - critical appreciation of poetry - selection from Palgrave's *GoldenTreasury* : four poems will be selected = 6 lecturers.

List of Books :

1. Longman Advanced Grammer (Reference and Practice) by L.G. Alexander
2. Collins Cobuild Students Grammer by Dave willis
3. Grammer Practice for Intermediate Students by W.S. Ellsworth.
4. Improving your writing by V.N. Arora (IIT - Delhi)
5. Remedial English Grammer by F.T. Ward
6. Palgraves Golden Treasury

APPENDIX : B

English Syllabus for BE Ist Semester
of Assam University, Silchar
(Taught at REC Silchar)
or 1st Semester BE Course

Part : I	Marks
Text Book : Six Prose Pieces	50

Prescribed Text
Reading for Technical Students
Publ : Mac Millan ltd.

Part : II

Grammar : -	
1. Sentence Structures.	25
2. Tenses.	
3. Phrases & Idioms.	
4. Prepositions.	
5. Punctuation / Voice / Narration.	
6. Determiners / Conjunctives & relatives / Adverbials.	
7. Comprehension.	15
8. Letter writting / Paragraph / Precis	10

LANGUAGE-
TERM-I

APPENDIX- C

Theory - 70 Marks
Sessional-30 marks
Total - 100 Marks

Unit	Topic/Sub-topics	Hours	T.Hrs
1.	Selection of prose lessons :	.....	15
2.	a) Journey into Space	1	
	b) How a submarrine works	1	
	c) An Interview	1	
	d) The engine	1	
	e) Oil	1	
	f) Radar	1	
	g) S.N.Bose	1	
	h) Nuclear Power	1	
	i) Scientific Research in India	1	
	j) India's energy crisis	1	
	k) What is inside the earth	1	
	l) Lifting and carrying	1	
	m) Methods-Old and new	1	
	n) Discovery of the X-Ray	1	
	o) Technology for mankind	1	
2.	Comprehension and precis writing. Writing on various topics		8
3.	Correspondances-		
	3.1 Simple correspondance	2	
	3.2.Business letters	2	
	3.3.Personal letters	1	
	3.4.Official letters	2	
	3.5.Letter to the Press	1	
	4.0 Correspion of errors		7
	4.1.Miscellencous errors	4	
	4.2.Errors in Appropriate preposition.	3	
	5.0.Punctuation	3	3
	6.0.Secentence Making.		9
	6.1.Clauses and Phrases	3	
	6.2.Analysis of sentences in to clauses.	3	
	6.3.Combination of sentences.	3	

L.R.MATERIALS :

a) English for Technical Students-By T.T.T.I Calcutta.
b) Higher English Grammer and Composition.
c) Good English Grammer.
d) Standard English.

****

APPENDIX : D

BE/I/ENG/98

1998

ENGLISH

Full Marks : 100
Pass Marks : 30

Time : 3 hours

The figures in the margin indicate full marks for the questions

PART - A

1. Answer in brief (Approx. 25 words) any three : 5×3 = 15

(a) How do the authors glorify the bridge in the chapter *The Bridge Building ?*
(b) What is a futuristic city plan ?
(c) What will be the effects of a Hydrogen Bomb in any future war ?
(d) What are the chief elements of science ?
(e) What was the role of Electricity in methods of faster production ?

2. Answer any *two (*Approx. 60 words) : 10×2 =2-

(a) What lesson may we draw from the short story *The Talking Quilt ?*
(b) How does science help us to do things better and more efficiently ? Discuss with suitable illustrations.
(c) Write in detail the six features of the plan on which the convenience and attractiveness of a city will depend.

3. Answer any one (Approx. *300 words) :* 15

(a) Put forward the arguments of Russell against war in your own words.
(b) Narrate the gradual development of Mechanical Engineering as a branch of study.
(c) What does the traveling trader face when he spends a night at the Inn ?

PART - B

4. Change the narration *(any three) :* 2×3 = 6

(a) Jadu says, 'My mother is ill'.
(b) Ram said that his father would go there.
(c) He said to me, 'Which is your book'?
(d) Shyamal said to her, 'Did you to there' ?
(e) Amal bade good-bye to his friend.

5. Make sentences with the following *(any five) :* 2×5 = 10

Know no bounds ; Lose heard ; In a nutshell ; Hard and fast ; Safe and sound ; Rain cats and dogs ; Once in a way ; Wear and tear ; Take heart ; Tall talk.

6. Differentiate between the words given in following pairs *(any three)* : 2×3 = 6

Hunt : Haunt : Jealous : Zealous : Sole : Soul : Statue : Statute : Bail : Bale : Causal : Casual.

7. Give antonyms of the following : 1/2×6 ='6

Defend, Dark, Deny, Bold, Thick, Safe.

8. Write a paragraph of about *100* words on any of the following : 10

(a) Your favorite teacher
(b) India in 21st century
(c) Had I been the Prime Minister of India

Or

Write a letter to your father informing him about your college festival (Approx. *100* words).

9. Read the following passage and answer the questions that follow :

We are all familiar with the various kinds of media : Electronic Media, Print Media, Etc. Being exposed to the multiple media at one time is experiencing multimedia. But, integrating all of them into your own desk - top or computer environment is multimedia, a field which is revolutionizing computer world now.

One of the great benefits of multimedia is the highly improved computer - user interface. People have beeb found to react more easily and faster to a multimedia environment than to a monomedia. As computers are becoming more and more powerful the attempt to make the user- interface proportionately friendlier is on. That is the only way technological advances in this field can be brought directly to the uninitiated, non - professional, potential users worldwide. Hence, the growing popularity of multimedia.

(a) What do you mean by following words ?- 3×1 = 3
desk-top, revolutionizing, interface.
(b) Name various kinds of media mentioned in the above passage. 2
(c) Define multimedia in your own words. 3
(d) What is the prime advantage of multimedia ? 2
(e) Discuss why is multimedia becoming more and more popular these days. 5

APPENDIX :E

New Technologies in ELT : Students' Attitude Survey Questionnaire

This questionnaire is related to English Language Teaching (ELT) at your institution. The researcher gives you full assurance that the information given by you will be kept confidential and used for the purpose of research only.

Note : Please fill up your answer or tick mark (√) where necessary

1. Name
2. Age : ☐ Male ☐ Female
3. State : ☐ Urban ☐ Rural
4. Mother Tongue
5. Institute : ☐ REC(S) ☐ IIT(G)
6. Class : 7. Branch :
8. You have Completed your school in :
   ☐ English Medium ☐ Regional Medium ☐ Mother Tongue
9. Medium of Instruction at 10+2
10. Name your a. School Board :
    b. 10+2 Board :
11. Mention the class you started learning English
12. Your percentage of marks in last School Board Exam :
    a. Science:.....% b. Mathematics :.....% c. English.....%
13. You use **English** in...
    a. Reading Text / Reference Books
    ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
    b. Answering in Exams :
    ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
    c. Viva / Interview
    ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
    d. *Presenting Reports / Sessions* :
    ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
    e. *Hostel / Social Activities*
    ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
14. Do you use ***Regional Language*** in Classroom / Lab :
    ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
15. Assess your English language skill yourself :
    a. Listening ☐ Very Good ☐ Good ☐ Weak ☐ Very weak
    b. Reading ☐ Very Good ☐ Good ☐ Weak ☐ Very weak
    c. Speaking ☐ Very Good ☐ Good ☐ Weak ☐ Very weak
    a. Writing : ☐ Very Good ☐ Good ☐ Weak ☐ Very weak

16 Do you think there is a **need for English language** programme in your technical course ?

☐ Yes ☐ No

17. How would you like to learn English ?

☐ As Compulsory Course ☐ As Optional Course ☐ Through Self-study kits

18. What should be the medium of instruction at your institution ?

☐ English ☐ Hindi ☐ Regional Language

19. Do you want English to be retained as the medium of Technical Education ?

☐ YES ☐ NO

20. Is English important for your future career ?

☐ YES ☐ NO

21. Tick mark (√) the career you would like to choose and put a cross mark (X) against it if it demands proficiency in English :

☐ Research ( )
☐ Management ( )
☐ Administration ( )
☐ Production ( )
☐ Consultancy ( )
☐ Teaching ( )
☐ Industry ( )

22. Do you think that for Technical Education lack of Proficiency in English is a disadvantage ?

☐ YES ☐ NO

23. Would you like to devote some extra time in learning English language ?

☐ YES ☐ NO

24. Would you like to have a special intensive English course ?

☐ YES ☐ NO

25. At which level would you like to have English language course ?

☐ First year ☐ Senior years (II/ III/ IV)

26. Do you find your language course specially designed for your technical studies ?

☐ YES ☐ NO

27. Indicate your opinion about the Text/Learning Materials provided for your language course :

☐ Useful ☐ Not Useful ☐ Interesting ☐ Boring

28. Would you like to have some supplementary text in your language course ?

☐ YES ☐ NO

29. Do you understand your subject better if regional language is sometimes used in the class ?

☐ YES ☐ NO

30. Do you think that the technical subjects can be taught more effectively in regional Languages ?

☐ YES ☐ NO

31. Do you think that English is learnt better through books & lectures in your technical subjects rather than through a English language course ?

☐ YES ☐ NO

32. Do you think that your Engg/Technical subject teachers are well equipped to fulfill your special language needs ?

☐ YES ☐ NO

33. Do you think that a cooperation between your Subject teachers and language teacher will lead to better design of English language programme ?

☐ YES ☐ NO

34. Which language skill do you think is more important than others for your engineering / professional career ?

☐ Listening ☐ Speaking ☐ Reading ☐ Writing

35. Do you feel you have a need to improve your English ?

☐ YES ☐ NO

35. Indicate the skill you would like to improve for the purpose of your Engg/ Technical profession :

☐ Listening ☐ Speaking ☐ Reading ☐ Writing

36. Identify a specific area of your weakness in using English language which needs immediate attention :

☐ Pronunciation ☐ Vocabulary ☐ Writing ☐ Reading ☐ Speaking

37. Do you think that the time allotted for your English language class is sufficient to attend your specific problems and weaknesses in English ?

☐ YES ☐ NO

39. How many hours (per week) will you need to amend your weaknesses in English ?

☐ 5-10 hrs ☐ 10 - 15 hrs ☐ 15 - 20 hrs ☐ more than 20 hrs..

40 Would you like have self-access learning aids like computers, audio and video lessons through which you can improve your English language proficiency ?

[ ] YES [ ] NO

41 Would you like to have such aids as learning-booster even if the English class time is extended to your desired length/periods per week ?

[ ] YES [ ] NO

42 Put a tick-mark (√)against the learning aids/equipments which are use in your classroom

Television	
Teleconferencing	
Video conferencing	
VCP	
Tape Recorder	
Film / Cinema	
Slide Projector	
Overhead Projector (OHP)	
Multimedia Computers	
Internet	

44 Put a tick-mark (√) against the learning aids/equipments you find suitable for the English Language course in your institution / classroom

Television	
Teleconferencing	
Video conferencing	
VCP	
Tape Recorder	
Film / Cinema	
Slide Projector	
Overhead Projector (OHP)	
Multimedia Computers	
Internet	

Thank you.....

APPENDIX : F

New Technologies in ELT : Survey Questionnaire (For Teachers)

This questionnaire is related to English Language Teaching (ELT) at your institution. The researcher gives you full assurance that the information given by you will be kept confidential and used for the purpose of research only.

Note : Please fill up your answer or tick mark (√) where necessary

1 Name :

2 Deptt :

3. Institute : ☐ REC(S) ☐ IIT(G)

4. Mention the subject you teach :

5. You use **English** while interacting with students in...

a. Lecture

☐ Always ☐ Sometimes ☐ Rarely ☐ Never

b. Explaining difficult teaching points :

☐ Always ☐ Sometimes ☐ Rarely ☐ Never

c. Viva / Interview

☐ Always ☐ Sometimes ☐ Rarely ☐ Never

d. *Seminar / Project Sessions* :

☐ Always ☐ Sometimes ☐ Rarely ☐ Never

e. *Hostel / Social Activities :*

☐ Always ☐ Sometimes ☐ Rarely ☐ Never

6. Do you use *Regional Language* in Classroom / Lab :

☐ Always ☐ Sometimes ☐ Rarely ☐ Never

7. Assess your students overall language skill :

a. Listening	☐ Very Good	☐ Good	☐ Weak	☐ Very weak
b. Reading	☐ Very Good	☐ Good	☐ Weak	☐ Very weak
c. Speaking	☐ Very Good	☐ Good	☐ Weak	☐ Very weak
a Writing :	☐ Very Good	☐ Good	☐ Weak	☐ Very weak

7. Do you think there is a **need for English language** programme in your institution ?

☐ Yes ☐ No

8 How would you like English language to be taught in your institution ?

☐ As Compulsory Course ☐ As Optional Course ☐ Through Self-study kits

9. What should be the medium of instruction at your institution ?

[] English [] Hindi [] Regional Language

10. Do you want English to be retained as the medium of Technical Education ?

[] YES [] NO

11 Is English important for your students' future career ?

[] YES [] NO

12. Tick mark (√) the career currently favoured by your students and put a cross mark (X) against it if it demands proficiency in English :

- [] Research ( )
- [] Management ( )
- [] Administration ( )
- [] Production ( )
- [] Consultancy ( )
- [] Teaching ( )
- [] Industry ( )

13. Do you think that for Technical Education lack of Proficiency in English is a disadvantage ?

[] YES [] NO

14. Would you like your students to devote some extra time in learning English language ?

[] YES [] NO

15. Would you like your students to have a special intensive English language course ?

[] YES [] NO

16. At which level would you like to put English language course ?

[] First year [] Senior years (II/ III/ IV)

17. Do you find the current prescribed English programme specially designed for your technical studies ?

[] YES [] NO

18. Would you like to have some supplementary text in your language course ?

[] YES [] NO

19 Do you think that your students will understand your subject better if regional language is sometimes used in the class ?

[] YES [] NO

20. Do you think that the technical subjects can be taught more effectively in regional Languages ?

☐ YES ☐ NO

21. Do you think that English is learnt better through books & lectures in your technical subjects rather than through an English language course ?

☐ YES ☐ NO

22 Do you think that the Engg/Technical subject teachers are well equipped to fulfill students' English language needs ?

☐ YES ☐ NO

23. Do you think that a cooperation between the Subject teachers and language teacher will lead to better design of English language programme for Engg. students ?

☐ YES ☐ NO

24. Which language skill do you think is more important than others for students' engineering / professional career ?

☐ Listening ☐ Speaking ☐ Reading ☐ Writing

25. Tick mark (√) the skill that you find most important according to the place of use :

a. In class room .	☐ Listening	☐ Speaking	☐ Reading	☐ Writing
b. In study	☐ Listening	☐ Speaking	☐ Reading	☐ Writing
c. In workshop / Lab	☐ Listening	☐ Speaking	☐ Reading	☐ Writing
d. Outside the classroom	☐ Listening	☐ Speaking	☐ Reading	☐ Writing

26. Do you feel that your students have a need to improve their English ?

☐ YES ☐ NO

27. Indicate the skill you would like your students to improve for the purpose of Engg/ Technical profession :

☐ Listening ☐ Speaking ☐ Reading ☐ Writing

28. Identify the area of your students' weakness in using English language

☐ Pronunciation ☐ Vocabulary ☐ Writing ☐ Reading ☐ Speaking ☐ Accent

29 Do you think that the time allotted for the English language class is sufficient to attend students' specific problems and weaknesses in English ?

☐ YES ☐ NO

30. Would you like your students to have self-access learning aids like computers, Video lessons & audio cassettes through which they can improve their English language proficiency ?

☐ YES ☐ NO

31. Would you like to have such aids as learning-booster even if the English class time is extended to the desired length/periods per week ?

□ YES □ NO

32 Put a tick-mark (√)against the learning aids/equipments you are familiar with :

Television	
Teleconferencing	
Video conferencing	
VCP	
Tape Recorder	
Film / Cinema	
Slide Projector	
Overhead Projector (OHP)	
Multimedia Computers	
Internet	

35. Put a cross (√)against the learning aids/equipments you find suitable for English language class in your institution :

Television	
Teleconferencing	
Video conferencing	
VCP	
Tape Recorder	
Film / Cinema	
Slide Projector	
Overhead Projector (OHP)	
Multimedia Computers	
Internet	

Thank you.....

APPENDIX : G

Participants' Background Data

A. Age

15 – 17 YRS	18 – 20 Yrs	21 yrs and above
2%	95%	3%

B. Domicile

Urban	Rural
31%	69%

C. Mother tongue

Assamese	Hindi	Bengali	Others
18%	13%	27%	42%

D. Medium of Instruction at 10+2 level :

Assamese	Bengali	Hindi	English	Others
15%	13%	18%	41%	13%

Appendix : H

A Pilot Study on Educational Technology Survey

1. Introduction

The paper presents the results of a survey and experiment conducted at the Regional Engineering College, Silchar (RECS) to assess the students' perception of their English language needs and to understand their attitude towards the use of modern teaching aids like multimedia computers in English Language Teaching (ELT) programmes. The paper specially deals with the problem of classroom time management that a language teacher faces in a technical institute and tries to judge the suitability and performance of learner- centered instructional aids like multimedia computers and pre-recorded instructional cassettes.

2. Background

Various researches in the field of EST (English for Sc & Tech) has established the fact that there is a felt need of English language ability among the students of technical education. In her NEST Survey, Damayanti Singh ed. (1990) has shown that "the students consider English as **'very important'** for the purpose of study as well as career". At the same time, English continues to be the medium of instruction and examination for technical Education in India. However in technical institutions the language classroom happens to be the 'peripheral subject' in comparison to other technical and science subjects. The All India Council for Technical Education (AICTE) in its guidelines for technical institutions in the country (1996) has allotted 5-10% of teaching time for Humanities & Social Sciences under which English language is taught. The language teacher at RECS, for instance, gets only three hours a week to teach English to 1st Semester BE students. These limited class hours are not sufficient to teach specific language skills as desired by the learners. It poses a more difficult problem for the students who are weak in English and need special attention from the teachers.

3. Objectives :

Two basic questions were posed by this study :

Whether our students are eager to have an access to some learner-centered educational aids like Multimedia Computers and instructional audio cassettes ?

- What is the effect on students' comprehension of class lectures if some self access educational aids like instructional cassettes and multimedia computers are made available to the students ?

4. Pilot Study

A pilot study involving Questionnarie survey and experiment was done . The survey was conducted through a specifically designed questionnaire .

5. Sample

A sample of 20 students were selected through a pretested diagnostic test from the 200 first semester students ascertaining that the sample subjects belong to the same level of language ability. However, the survey questionnaire was administered among the whole class of 200 students. Again these 20 students were randomly put into two groups of 10 students each viz., **Experimental Group** & **Control Group** for the purpose of post-survey experiment.

6. Tools

A modified questionnaire was prepared based on the NEST Survey which was designed by the Language Studies Unit at IIT, Kanpur (Singh, Damayanti ed., 1990). The pre-experimental or **input test** was conducted through a Language Test constructed by UCLES & Chritopher Jones (*CUP ELT Software Pack A & B).* The **output test** was conducted through an objective type comprehension test based on five prescribed texts in first Semester BE syllabus.

7. Procedure

A set of five texts were taught by this researcher to the subjects (both groups) in the classroom for a period of one month in the usual manner during allotted routine hours (Total 11 hrs). However the students of the experimental group were allowed to use Multimedia Computers with ELT software, Multimedia Dictionaries & Encyclopedia beyond class hours. The Multimedia Laboratory at RECS was made accessible to all experimental group subjects twelve hours a day on self access basis. Preliminary instructions to run the software were given to subjects in the beginning so that they can use the computers themselves. Besides this, a pre recorded audio cassette containing textual lectures by the teacher was given to each of the students for repeated listening. Such facilities were not available to the control group.

At the end of teaching period both the groups of students were asked to take a comprehension test . Fifty objective type comprehension questions were set from the five taught texts. Each question carried two marks and all the students were asked to answer the same set of questions. Through a pre-experimental try-out the time limit for the test was set to be of one hour.

Though there were a variety of problem areas in the English language skill of the students, for the purpose of this study the **comprehension** ability with special attention to vocabulary building was taken up.

8. Survey Data

8.1 How Important is English for Studying Science & technology ?

Very Important	Moderately Important	Minimally Important
79%	15%	6%

8.2 How important is English for your future career ?

Very Important	Moderately Important	Minimally Important
72%	19%	9%

8.3 Do you think lack of proficiency in English is a disadvantage in terms of Engineering Education & Profession ?

Yes	No
87%	13%

8.4 Do you feel you have a need to improve your English ?

Yes	No
89%	11%

8.5 Do you think that the time allotted for your English language class is sufficient to attend your specific problems and weaknesses in English ?

Yes	No
14%	86%

8.6 How many hours (per week) will you need to amend your weaknesses in English ?

5-10 hrs	10 - 15 hrs	15 - 20 hrs	more than 20 hrs..
36%	42%	15%	7%

8.7 How would you like to learn English ?

As a compulsory Subject	As an optional Subject	Through self-study materials
30%	20%	45%

8.8 Would you like to devote some extra time in learning English ?

Yes	No	No Response (NR)
87%.	7%.	6%.

8.9 Would you like have self-access learning aids like computers & audio cassettes through which you can improve your English language proficiency ?

Yes	No
88%	12%

8.10 Would you like to have such aids as learning-booster even if the English class time is extended to your desired length/periods per week ?

Yes	No
69%	31%

8.11 Put a cross 'X' against the learning aids/equipments you are familiar with :

TV	87%
VCP	87%
Tape Recorder	76%
Computers	78%

9. Experiment Results

Results of the Experiment are presented in a tabular form (Table 1 & 2) in the annexure :1. A comparative chart of the mean scores of Experimental & Control Group is given below :

Annexure : I

Final performance of Students*

Table 1 : Experimental Group

Students Code	Score in Post-experimental Test
E01	61%
E02	56%
E03	66%
E04	70%
E05	61%
E06	63%
E07	59%
E08	49%
E09	55%
E10	58%

Table 2 : Control Group

Students Code	Score in Post-experimental Test
C01	31%

C02	35%
C03	34%
C04	34%
C05	33%
C06	32%
C07	30%
C08	31%
C09	29%
C10	27%

* Entry level has been neutralised to an equal level of zero through the Diagnostic Test to judge the final performance from the score in output test.

	Experimental group	Control Group
Mean	59.8	31.6
SD	6.03	2.46
SE	1.90	.74

10. Conclusions

a. Students' Need Survey:

- Students of Engineering do realize that English language is important for their studies as well as professional career. They also perceive that that it will be a disadvantage for them as Engineers to be weak in English and as such majority of them (89%) feel that there is need to improve their English.

- As much as 86% of the students feel that class hours allotted for English class is not enough for attending their specific weaknesses in English. Almost half of the students (42%) think that they will need 10 to 15 hours a week to have remedial exercise to remove such language deficiency.

- Students are eager to devote some extra time for English language exercises and larger number of students (45%) want self-study materials rather than a compulsory or optional course in English. Most of them are aware of learning aids like TV, VCP, Tape Recorder and computers and they are interested to have such technologies to help them improve their English even if the class hour is extended to their desired length.

b. Experiment conclusions :

1. Students' comprehension of English language texts is greatly enhanced by the use of self-access learning aids besides normal classroom hours. It demands no extra time on the part of the language teacher as except the initial setup/instructions about the Computer, the teacher doesn't interfere with the self-learning process with the help of these aids.

2. Students were more successful to understand the texts with the help of Multimedia Dictionaries and repeated listening of recorded instructions

helped them to recapitulate teacher's lecture more promptly. Hours of interaction with Multimedia Encyclopedia (Infopeadea. 1995) increased their level of understanding compared to the level achieved by the control group.

3. Students spend more time in interaction with computer than the class hours and this period of interaction increases with the passage of time as they grow more accustomed with computer operations (Table : 3).

4. Students improve their vocabulary through multimedia surfing. They understand the language better through a number of multimedia tools like Dictionary, Thesaurus, Encyclopaedia, Atlas etc. in a lively environment of sound, photographs, maps and texts etc.

5.

Another major aspect of language learning viz., Grammar Practice can also be handled by utilizing specialized grammar games software as an additional boost up against monotonous sessions with computers

Table :3

Student	No of Hours per week on Grammar games spare-time activity
E01	2.5
E02	2
E03	1.5
E04	1
E05	2
E06	2.5
E07	2
E08	1
E09	3.5
E10	3

This report was presented as a paper presented at the International Conference on Information Technology in Education and Training at INDORE, India, December 28-30, 1996 organised by All India Association for Educational Technology

MODEL LESSON : 02

Lesson No : 02
TEXT : 02
TITLE :
The Talking Quilt

Course : BE. level : 1st Sementer,
Time : Classroom : 3 Hrs
Home : 10 hrs
Total 13 hrs (Approx)

(Text Book Courtesy : McMillan India Ltd.)

Objectives

1. To teach the prescribed text with an aim to *increase the technical vocabulary and comprehension of the text* with self-access interac multimedia instructional aids.
2. To encourage supplementary reading on related topics through interactive Multimedia Encyclopedia on Computers.
3. To give pronunciation practice with the help of pronunciation dictionary (Longman / Sound-CD ROM)
4. To correct common error encountered by the students with help of Error Correction Dictionary on CD-ROM (Longman)

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
THE TALKING QUILT You know what a quilt is ; and you also know that it can't talk. But there was one that did ; at least, so says a Japanese tale. It runs thus : Late one night, in the depth of winter, a travelling trader reached a small town, and went to the only inn in the place for supper and a bed. The innkeeper, who was about to close his door for the night, told him that all his rooms were occupied. But the weather was raw, and the traveller was fatigued, so he prevailed upon the landlord to give him whatever shelter he could. Supper over, the tired traveller eagerly retired to the narrow, passagelike room to which he was shown by the innkeeper, and which stood between two others that were already occupied. There was no light in teem ; the inmates had evidently gone to sleep.	The teacher asks the pupils to read the paragraph & highlight / enlist the difficult words which they do not understand.		Students enlist the difficult words and write them down on notes. **Tale** **Inn** **Fatigue** **Indignant** **Hutment** **Pawn-broker** **Conscientiously**	Reading Writing

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
The trader was shown a rigged up bed which looked fairly comfortable and warm. Eager to stretch his aching limbs and warm his shivering body, he snuffed out the candle and turned in. He slept heavily for about two hours. Then, as his fatigue wore off, he woke to the sound of voices speaking close to him. "Dear elder brother, are you cold ?" asked the thin voice of a young boy. "And are you cold :" said a slightly maturer voice. The merchant, now thoroughly foused, looked about, but could see nobody in the darkness. "It must be some boys in the next room", he said to himself, turned over on the other side, and prepared to sleep again. Just as he was about to fall asleep, however, he again heard the voices : "Dear elder brother, are you cold ?" "And are you cold ?" "Sh-j-h-h", he said, "not so loudly, bous not so loudly."	Teacher runs the MMC and runs the suitable CD-ROM Titles containing the necessary dictionary. He then asks the students to search for the words themselves on the CD and note down any other related items which interests them.	**MMC** **IDC &** **PDC >**	Students search for the meaning of the difficult words & refers to many other words which are related to the topic and comes up as marked lateral reference to the words searched for. **Dictionary Meaning & Pronunciation (RP)** Pawnbroker Innkeeper Conscientious Shivering	Compre- hension Kn Sp

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
Silence for some time . The merchant thoutht that his admonition had had the desired effect. Presently, however, just as he was about to deze of, back came the voices : "Dear elder brother, are you cold ?" "And are you cold ?" The traveller got annoyed, and decided to settle the affair, He lit the candle, looked under the bed. No one there. He put his ear to the paper partitions of the adjoining rooms ; he only heard the steady beathing of sleepers. He could not think of anywhere that the voices could come from. But there they were, undoubtedly, and they would return whenever he tried to compose himself to sleep. Finally, he gave up all idea of sleeping, took out his book of prayers, and sat up reading them As soon as it was light, he sought out the innkeeper, protested about the treatment he had found at the inn, settled his account indignantly, and walked forth, vowing never to stay in that inn again.		**EGC >** **PIC>**	**Grammar / Conjugation of Verbs** **Protest** **Doze** **Partition** **Picture association of words:** **Inn** **Hut**	Kn Wr Vocab

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
Now the innkeeper was an earnest and honest man, and he was not a little sorry for having displeased a customer. So he decided to sleep in the foom that night and find out the truth for himself. It did not take him long to find that there indeed were voices speaking, for no sooner was he about to fall asleep than he heard them : "Dear elder brother, are you cold ?" "And are you cold ?" Now he was sure there were no children among his guests ; and he also ascertained that there was no one in his room ; and yet, whenever he was half asleep, he would wake up to hear the two odd questions. He sat up and thoutht ; there was nothing new and unusual about the room, nor had any of his previous guests complained. He was greatly puzzled. Finally it struck him that the only new thing about the room was that quilt that he had lately bought at the pawnbroker's shop.	**The teacher** then asks the students to refer to Multimedia Encyclopedia and search the words selected by them or any other idea / concept which they feel interested about.	**MMC** **MEC>**	**The students** run the *Infopedia* Encyclopedia and refer to the following words & other related information : **Japan** **Inn** **Hut**	**Vocab.**

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
"Ah", he said as an idea came to him, "can it be...?" He got up at once, took the quilt and deposited it on a bench in the sitting room, and brought instead his own usual quilt, and laid himself down to sleep. And sleep he did, for no longer that night did he hear those disturbing words. That settled it. Next morning he hurried with the quilt to the pawnbroker, and narrated his experience. "Where did you get this ?" he asked. The pawnbroder recollected that it had been brought to him hy the landlord who lived in the big house in the town square. So to him they both went. "Sir, will you tell us where you got this quilt ?" "Sure', said he, "this was all Icould get from the family in my hutment at the end of the town, for all the rent they owed me."		Thesaurus > **MEC >**	**Contd....**	**Vocab** **Kn.** **Wr**

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
		Thesaurus>	**Contd....**	
The pawnbroker and the innkeeper made inquiries from the neighbours of the family, and this is what they learned :- The father and mother had long been without employment, and could get nothing wherewith to keep body and soul together. They had sold all they had, one by one and finally they died of cold and starvation, leaving behind two young sons and a quilt. The waifs had pulled on for a few days longer, with he crumbs of food which their equally poor neighbours could occasionally spare for them. At last, the famished children could no longer face the cold and hunger, and one morning the two were found huddled together under the quilt, deat. This was the sad story. The innkeeper could very well imagine that, as life was urnning out of them, the unfortunate children must have drawn closer and		**MEC >**		**Kn** **Wr** **Vacab** **Sp.**

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
			Contd...	
closer and closer to each other, trying to keep themselves warm ; and, each more anxious about the other than himself, must have kept asking- "Dear elder brother, are you cold ?" "And are you cold ?" When this pathetic story came to be known, the good people of the town resolved that such tragedies must not recur ; so they set up a fund to which everyone in the town honestly and conscientiously contributes his share every month, and out of this fund they maintain any of their *fellow-civizens who may be too old or ill to work, or be* willing but unable to obtain work. And the big landlord himself built a house where the hut had stood, and anyone who is too poor to afford a shelter can stay there for the night. In a glass case in that house is dept the quilt that once vented the anguish of the two unfortunate children. If you go to the town today, you can see the house and the quilt ; and the people will tell you with pride that there has since been no case of starvation or neglect of the ill and the aged and the poor in that town.				

Follow up Activities

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
Follow up	The teacher will give the students a pre-recorded audio-cassette for listening practice in their own leisure hour & answering some questions based on the audio-tape	**<TR**		**Listen Speak. Wr**

APPENDIX : I(2)

MODEL LESSON : 03

Lesson No : 03
TEXT : 03
TITLE :
THE DEVELOPMENT OF MECHANICAL ENGINEERING

Course : BE. level : 1st Sementer,
Time : Classroom : 3 Hrs
Home : 10 hrs
Total : 13 hrs (Approx)

(Text Book Courtesy : McMillan India Ltd.)

Objectives

1 To teach the prescribed text with an aim to *increase the technical vocabulary and comprehension of the text* with self-access interactive multimedia instructional aids
2 To encourage supplementary reading on related topics through interactive Multimedia Encyclopedia on Computers
3 To give pronunciation practice with the help of pronunciation dictionary (Longman / Sound-CD ROM)
4 To correct common error encountered by the students with help of Error Correction Dictionary on CD-ROM (Longman)

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
THE DEVELOPMENT OF MECHANICAL ENGINEERING (OXFORD JUNIOR ENCYCLOPAEDIA, VOL.VIII) The history of mechanical engineering might be said to go back to the time when man first tried to make machines to save himself work and to apply more power than human or animal strength alone could produce. The term 'machanical enginnering', however, was not used until the late 18th century, after the invention of the steam engine. Most engineering in very early days was concerned with warfare. Ten the term civil engineering was used to distinguish such activities as bridge building from military enginnering. Mechanical engineering as we understand it today, stems srom the Insustial Revolution ; but the invention which really altered the whole outlook was Watt's steam engine of 1769.	The teacher asks the pupils to read the paragraph & highlight / enlist the difficult words which they do not understand.		Students enlist the difficult words and write them down on notes. mechanical micrometer workshop architecture accuracy hydraulic precision	Reading Writing

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
Metals became the main material for the enginner instead of wook, and steam gave man unheard of reserves of power to drive not only railway engines and ships but also the machines which built them. Stronger materials were needed to withstand the new-found power that the steam engine was offering. Mechanical engineers had, therefore, to find ways of meeting these new problems. To make steam engines, and the machinery which steam engines could work, men lacked machine tools which would shape metal, and methods of measuring to an accuracy hitherto unknown. One of the pioneers who tackled these problems was Joweph Barmah, who was born near Barnsley in 1748. When he tried to make parts for his own inventions, his attention was drawn to the need for better machine tools ;	Teacher runs the MMC and runs the suitable CD-ROM Titles containing the necessary dictionary. He then asks the students to search for the words themselves on the CD and note down any other related items which interests them.	**MMC** **IDC &** **PDC >**	Students search for the meaning of the difficult words & refers to many other words which are related to the topic and comes up as marked lateral reference to the words searched for. **Dictionary Meaning & Pronunciation (RP)** machine engine hydraulic precision	Compre- hension Kn Sp

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
and finally, in 1802 he patented a design *which was described as being 'for producing straight, smooth, and parallel* surfaces on wood and other materials requirint truth'. This was the forerunner of the modern planing machine. Bramah won such a reputation that other leading engineers were drawn to his works in Pimlico, London. Notable amongst these was henry Maudslav-born in 1771-who was probably the greatest of the designers of machine tools for metal-working. He developed the prototype of the modern lather and laid the basis for both the metal-working planer and the slotting machine. Each new tool invented was in most cases designed to meet a particular need : for instance. Maudslay invented a screw cutting lathe in 1797 to help Bramah develop a hydraulic press on which he was working. Mechanical engineering continued to develop as each engineer, learning from his predecessors, improved still further the tools for the job. Maudslay left Bramah and started on his own.		**EGC >** **PIC**	**Grammar / Conjugation of Verbs** develop produce design improve **Picture association of words:**	Kn Wr

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
Once again, the country's leading young engineers sought experience at a famous man's works. Amongst many who came to Maudslay was Joseph Whitworth, who became his most famous pupil. Whitworth, born in 1803 laid the basis for modern precision engineering. With the growth of industry, Circumstances were changing rapidly. The old standards of accuracy-measured with a 2-foot wooden rule-were no longer adequate. Watt, in producing his first team engines had been satisfied with a fitting accuracy within 'the thickness of an old shillong.' Now, with the advent of the high-pressure steam engine, and the growth of mechanical engineering in general, accuracies to within one thousandth of an inch were necessary. Whtiworth realized two fundamentally imoportant facts. He must have a really flat surface (a 'true plane') as a basis of	**The teacher** then asks the students to refer to Multimedia Encyclopedia and search the words selected by them or any other idea / concept which they feel interested about	MMC MEC>	**The students** run the *Infopedia* Encyclopedia and refer to the following words & other related information : Steam Engine Mechanical -Electrical measurement	Kw Vocab. Sp.

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
reference-obviously it is important, for instance, to measure the height of anvthing accurately if it is standing on a uneven surface. Secondly, he appreciated that the method of measuring by eye, by looking at the rule, could never be sufficiently accurate. Whitworth produced his first true plane in 1830, and later he built an improved planing machine which could reproduce this plane at will. Such precision for flat parts. badly needed for sliding surfaces, was revolutionary. Whitworth also developed his 'workshop measuring machine' which was the forerunner of the modern micrometer and could measure accuratly to less than tne shousandth of an inch. In course of time he so improved his measuring machine that it would give accurate readings to less than one millionth of an inch.		Thesaurus > **MEC >**		kw. Vocab. Sp.

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
Many famous engineers. such as Boulton and Watt. Trevithick (responsible for the high pressure steam engine), 'Brunel, Nasmyth (inventor of the steam hammer), and others so revolutionized their age that, by about 1840, mechanical engineering had most of the basic tools it needed, as well as the means of measurement ; there were engine driven lathes, borers, planers, slotters, millers, shapers, and drilling machines, all capable of working in iron. Bu 1850 there were over 6,000 miles of railway line in Britain alone, and the Atlantic had been crossed and re-crossed by steam power. Britain had become the centre of mechanical engineering in the world. The next problem was to find methods of increasing production-in other words, to build machines which could trun out work faster, this in turn meant the development of better materials for cutting tools and stronger metals for the machines themselvs.		Thesaurus > **MEC ≥**		Kn. Vocab Sp.

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
The development of the Bessemer steel-making process, which was patented in 1856, went some way to meet this need. Mushet, in 1868 descovered that the addition of tungsten to steel gave it special properties, and this paved the way towards high speed tool steel a special steel eventually developed by Taylor and White and first demonstrated in 1900. Electricity came into the factory towards the end of the 19th century. In the 20th century the engineer has at his command many sources of power unknown in the 18th century. Now the mechanical engineer is concerned not only with the steam engine, but also with the electric motor, the internal combustion engine, the steam turbine and latterly the gas turbine and still further sources of power are on their way. Better materials to meet these new demands are constantly being developed, especially new alloys for sepceal purposes.			Contd.	

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
As *human labour* becomes more expensive machinery tends to become more automatic. Electronics have become important both for controlling production machinery and for *measurement.* To-day there is the same problem of making materials and tools keep up to the deaands of new invention. Whittle, for example, when he invented the gas turbine (or jet engine) had to wait until special alloys were available which would be strong enough for the turbine biades. Engineers today are still actively engaged in finding better methods both of making and inspection this vital part of the jet engine beacuse, dur to their awkward shape and need for exceptional accuracy, these blades raise special engineering problems. It is a long stretch from Watt's early steam engine to today's supersonic aircraft, yet in fact it is less than 200 years.			Contd.	

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
			Contd.	
Never before in man's history had mechanical engineering developed at such a speed-a progress as much due to the pionerrs of our own time. The history of development is continuous, for in the modern industrial phase, each pioneer meets new requirements with methods of mechanical engineering out of which the techniques of the next period develop. Today it is less easy to define mechanical engineering, since it is necessarily combined with other types of engineering. Further, the whole field of engineering has become so complex that a high degree of seeciallization has become inevitable. For example, the making of aircraft is known as Aeronautical Engineering, that of maiing shi[s' engines as Marine Engineering, and that of building bridges or similar structures as structural of Civil Engineering and so on.				

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
But all of these branches are, of course, also concerned with mechanical engineering because, without it, they could not make tehir own particular structures. The civil engineer, for instance, depends on mechanical engineering for poducing the metal parts he uses. Also, he must have a wide knowledge of mechanical engineering hisself, as, indeed must all other engineers. Mechanical engineering in fact is the basic on which al other forms of modern engineering depend fundamentally. Even the electrical engineer uses machinery, machine tools, and so on, in the production of his electrical apparatus. An electric motor for example, could not be build were it not for such mechanical equipment as presses to stamp the laminations lathes and other machines to form the shafts, grinding machines and many other types of machinery.			Contd.	

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
			Cont'd.	
The mechanical engineer drvises and makes the machinery with which metals can be worked into the variety of forms and shapes needed in fodern industry and devises machines which make automatic mass production with higher and higher outputs possible.				

Follow up	The teacher will give the students a pre-recorded audio-cassette for listening practice in their own leisure hour & answering some questions based on the audio-tape	**<TR**		Sp. Listening kn. Wr.

MODEL LESSON : 04

Lesson No : 04
TEXT : 04
TITLE :

Course : BE. level : 1st Sementer,
Time : Classroom : 3 Hrs
Home : 10 hrs
Total 13 hrs (Approx)

ELEMENTS OF A CITY PLAN

(Text Book Courtesy : McMillan India Ltd.)

Objectives

1 To teach the prescribed text with an aim to *increase the technical vocabulary and comprehension of the text* with self-access interactive multimedia instructional aids
2 To encourage supplementary reading on related topics through interactive Multimedia Encyclopedia on Computers.
3.To give pronunciation practice with the help of pronunciation dictionary (Longman / Sound-CD ROM)
4 To correct common error encountered by the students with help of Error Correction Dictionary on CD-ROM (Longman)

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
ELEMENTS OF A CITY PLAN HAROLD MACEAN LEWIS What is this thing that we speak of as a city plan ? The idea most commonly conveyed by the rerm is a map showing the boundaries of the city the street system which already exists. and such streets as have been laid out for future development. Actually is is mich more than that. It includes both such a map and the master plan for the frture city. The first of these maps is generally merely an "as is" map to which are added. from time to time, proposals for new streets or parks to the acquisition and construction of which it is trerefore committed. The prepatation of such a map is little more than surveying more or less precise surveying, it may be, but it may involve little study of thne needs of the community, little sympathy with the traditions and ideals of its people,	The teacher asks the pupils to read the paragraph & highlight / enlist the difficult words which they do not understand.		Students enlist the difficult words and write them down on notes. boundaries trasportation survey facilitate Sanitation	Reading Writing

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
little exercise of imagination as to its development and requirements. It is ciefly without great expense; a record of the mastakes which have been made through lack of foresight and imagination. Not that such mistakes were necessarily due to stupidity, for a generation or two ago no one could have foreseen the marvellous development of our cities or the great social and economic change brought about by recent inventions which have so greatly facilitated transit and other means of communication. The real "city plan" need not be so minute as to details but must condider, primarily, the city as a whole, not only as it is, but as it will be. This comprehenvive. or master plan shows the general system of arterial streets and transportation lines by which the different sections of the existing and the future city will be connected with each other and with centres of population outside the city limits ; parks and open spaces abd other resorts for recreation	Teacher runs the MMC and runs the suitable CD-ROM Titles containing the necessary dictionary. He then asks the students to search for the words themselves on the CD and note down any other related items which interests them.	**MMC** **IDC &** **PDC >**	Students search for the meaning of the difficult words & refers to many other words which are related to the topic and comes up as marked lateral reference to the words searched for. **Dictionary Meaning & Pronunciation (RP)** boundaries trasportation survey facilitate recreation comprehensive marellous	Compre- hension Kn Sp

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
and amusement; the existing water front development and the space needed for its further increase; existing public and semi-public buildings and sites for those which may be required in furure ; and includes such public controls over private development as are found in a Zoning ordinance. Such a plan will control future development stimulating it or retarding it as the case may require. It supplies something to which the city may grow, not something to which it must be resrticted or within which it must be confined. The economic considerations which should control city planing are prescisely those which should preavail in design of a house, shop, railway terminal, or water supply system; namely, adaption to probable or possible increase in demand and capacity to supply that demand. To tear down and enlarge is very costly especially when there is no room for enalrgement without the purchase of additional land which has become far more valuable than when the orginal enterprise or settlement was hagun.			**Grammar / Conjugation of Verbs**	Kn
		EGC ≥	plan enlarge transport	Wr
			Picture association of words:	
		PIC	city railway	

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
This is being constantly done by individuals and corporations whose domestic or business requiremnts make it necessary. In any case it involves a distinct loss which may be justified by the means of indulging in a luxury or by the prospect of increased profit. Cannot the city, it may be asked, instead of trying to provide for the remote future, well afford the expense of reconsturction to adopt itself to its growing needs, especially when it has the power, throuth its ability to levy taxes and assessments, to impose a part or all the cost of the necessary cahnges upon the property which will be chiefly benefited ? No expense involving the destruction of property can be justified if it can be avoided by the exercise of reasonable forethoutht, and the taxing power of the city should not be used unnecessarily. The requirements of the modern city are so great that the burden of taxation will inevitably be heavy.	**The teacher** then asks the students to refer to Multimedia Encyclopedia and search the words selected by them or any other idea / concept which they feel interested about.	MMC MEC>	**The students** run the *Infopedia* Encyclopedia and refer to the following words & other related information : Architect city-pan park taxation domestic	Kw. Vocab. Sp. Wr.

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
An American writer has given twelve heads under which significant facts should be collected and classigied in a study of city planning, namely : streets : transportation of people; transportation of goods; factories and ware housed; food supply and market; water supply and sanitation; housing, recreation; parks, boulevares and tree planting; architecture; laws, and financing. A French writer gives four divisions of the city which require specials stedy and treatment, the business, the industrial the administrative and the residential quarters, He also notes that "the climatic conditions of each country must necessarily detemine the type of dwellings selected by the inhabitants." Edward M. Bassett has listed the following seven elements of community land planning, streets, parks, sites for public buildings, public reservations, zoning districts routes for public utilities pierhead and bulkhead lines.		Thesaurus > **MEC >**	Contd.	Vocab. Sp. Kn. Wr.

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
The convenience and attractiveness of a city will depend chiefly upon the following six features of the plan : 1.The transporation system for the movement of persons, freight, and other goods in and out of the city, including the necessary terminals and meand of interchange. In a water front city this includes port development; in all cases it covers transport by fail, water high way, and air where such facilities are available. 2. Public facilities for the quick movement of passengers and freight from one part of the municipality to another.This may be called the intra-urban transport system. Part of such facilities will always be in the streets themselves. 3. The street system in and through which the daily business is done and by which the people gain access to their .		Thesaurus > **MEC >**	Contd.	Vocab. kw. Sp. wr.

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
			Contd.	
homes and pass from these homes to their work, recreation and amusement. A street ststem once adopted and developed must remain indefinitely. While some streets may be widened and an occasional new street may be cut through existing improvements, the general street plan, once established and consructed, is fastened upon the city as long as the city itself lasts. 4. The park and recreation facillities upon which the comfort and health of the community are to a large degree dependent. A park system can be most effectively and satisfactorily established in advance of other improvements. 5. The location of public buildings, which may render the conduct of public business convenient or difficult and may give a favourable or unfavourable impression to visitors.				

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
The suitability of their sites will depened upon streets about them and leading to them, so that the location of these buildings should receive the most careful study in the preparation of the general plan of the city. 6. The pattern of land uses, to be effected primarily through comprehensive zoning, such a pattern should specify not only the kind of use but also the character and density of its development. While three are other elements which go to make up the complex organism called the modern city, those enumerated above are the ones likely to give the town its character, to meke it convenient or inconvenient, dignified or commonplace.			Contd.	

Follow up	The teacher will give the students a pre-recorded audio-cassette for listening practice in their own leisure hour & answering some questions based on the audio-tape	<TR		Wr Listening Sp.

MODEL LESSON : 05

Lesson No : 05
TEXT : 05
TITLE :

THE GLORY OF BRIDGEBUILDING

Course : BE. level : 1st Sementer,
Time : Classroom : 3 Hrs
Home : 10 hrs
Total 13 hrs (Approx)

(Text Book Courtesy : McMillan India Ltd.)

Objectives

1. To teach the prescribed text with an aim to *increase the technical vocabulary and comprehension of the text* with self-access interactive multimedia instructional aids.
2. To encourage supplementary reading on related topics through interactive Multimedia Encyclopedia on Computers.
3. To give pronunciation practice with the help of pronunciation dictionary (Longman / Sound-CD ROM)
4. To correct common error encountered by the students with help of Error Correction Dictionary on CD-ROM (Longman)

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
THE GLORY OF BRIDGEBUILDING DAVID B. STEINMAN &, SARA ROTH WATSON Our theme is man's conception and creation of bridges. We want to review for you the story of bridges, not as a dry recital of span lengths or structural principles or erection details, but rather as a heart-stirring, narrative of high adventure and deep dramatic interest. We want to give you a glimpse into the drama, the romance, the poetry of bridgebuilding. We want to tell you of men's dreams, of their faith of their struggles, of their tragedies and of their glorious victories. We want you to visualize the story of bridges as an epic of human vision and courage, high hopes and disappointments, heroic eftorts and inspiring achievements.	The teacher asks the pupils to read the paragraph & highlight / enlist the difficult words which they do not understand.		Students enlist the difficult words and write them down on notes.	Reading Writing

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
We want you to picture the attainment of greater and greater once spans, not as a matter of routine development, but as man's front line battle to force out ward the challenging barrier that separates his efforts from the "impossible". We want to make you see bridges as we see them not as mere prosaic objects of utility and economy, but as something far more significant and sinpiring. For a bridge is more than a thing of steel and stone, it is the embodiment of the effort of human heads and hearts and hands. Intellingence, aspirations Labour and still. a bridge is more than s sum of stresses and strains it is an expression of man's creative urge-a challenge and an opportunity to create the beautiful. A bridge is the fulfillment of human dreams and hopes and aspirations. A bridge is the symbol of humanity's heroic struggle towards mastery of the force of nature. A bridge is a monument to mankind's indomitable unyielding that cannot be shodned will to achieve.	Teacher runs the MMC and runs the suitable CD-ROM Titles containing the necessary dictionary. He then asks the students to search for the words themselves on the CD and note down any other related items which interests them.	**MMC** **IDC &** **PDC >**	Students search for the meaning of the difficult words & refers to many other words which are related to the topic and comes up as marked lateral reference to the words searched for. **Dictionary Meaning & Pronunciation (RP)** aspirations visualize heroic embodiment indomitable symbolize defiant	Compre- hension Kn Sp

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
Bridges symbolize the ideals and aspirations of humanity. They span the barriers that divide, and they bring peoples. communities and nations into closer unity. They shorten distances, speed transportation and facilitate commerce. They carry their burdens that the task of men may be lightened. They sreve the needs of the lowest as of the highest. They are cooperative efforts of planners and workers, of science and skill. They embody the initiative and vision of communities in useful monuments didicated to the welfare of future generations. They are vital links in the highway leading to the universal brotherhood of manking. Bridges have inspired poets through the centuries and have played their part in literature and legend. There is something about a great span that stirs the imagination of men. From its foundations rooted in bedrock to its towering pylons and vaulting span, a bridge is a thing of wonder and of poetry.		**EGC >**	**Grammar / Conjugation of Verbs** bring dedicate glory	Kn Wr
		PIC	**Picture association of words:** sun bridge highway construction	Kn Sp. Reading Wr

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
It is a mvsuc union of strength and beauty-a magic blending of graceful, soaring lines and defiant power. Over barriers that separate, the arching span is a link of unity. It is a humble symbol of service and a proud symbol of conguest. It typifies, more vividly than any other work of man faith and vision triumphant in the eternal struggle of brains and steel against the elements. And when seen in the glow of sunset or the wizardry of moonlight, a beautiful span is indeed "a poem stretched across a river"-a stairway for the stars".	**The teacher** then asks the students to refer to Multimedia Encyclopedia and search the words selected by them or any other idea / concept which they feel interested about.	MMC MEC>	**The students** run the *Infopedia* Encyclopedia and refer to the following words & other related information : bridge glory highway	Vocab. Reading Wr Sp. Vocab.
Follow up	The teacher will give the students a pre-recorded audio-cassette for listening practice in their own leisure hour & answering some questions based on the audio-tape	<TR		Sp. Listening Reading Wr.

MODEL LESSON : 06

Lesson No : 06
TEXT : 06
TITLE :

The Choice Before Us

Course : BE. level : 1st Sementer,
Time : Classroom : 3 Hrs
Home : 10 hrs
Total 13 hrs (Approx)

(Text Book Courtesy : McMillan India Ltd.)

Objectives

1. To teach the prescribed text with an aim to *increase the technical vocabulary and comprehension of the text* with self-access interactive multimedia instructional aids.
2. To encourage supplementary reading on related topics through interactive Multimedia Encyclopedia on Computers.
3. To give pronunciation practice with the help of pronunciation dictionary (Longman / Sound-CD ROM)
4 To correct common error encountered by the students with help of Error Correction Dictionary on CD-ROM (Longman)

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
THE CHOICE BEFORE US **BERTRAND RUSSELL** The general public, and even many men in positions of authority, have not realized what would be involved in a war with hydrogen bombs. The general public still thinks in terms of the obliteration of cities. It is annihilate understood that the new bombs are more powerful than the old, and that while one atomic bomb could obliterate Hiroshima, one hydrogen bomb could obliterate the largest cities such as London, New York and Moscow. No doubt in a hydrogen bomb war great cities would be obliterated. But this is one of the minor disasters that would have to be faced. If everybody in London, New York and Moscow were exterminated, the world might, in the course of a few centuries, recover from the blow. But we now know, especially since the Bikini test that hydrogen bombs can gradually spread destruction over a much wider area than had been proposed.	The teacher asks the pupils to read the paragraph & highlight / enlist the difficult words which they do not understand.		Students enlist the difficult words and write them down on notes. hydrogen destruction sink Hiroshima	Reading Writing

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
It is stated on very good authority that a bomb can now be manufactured which will be 25,000 times as pewerful as that which destroyed Hiroshima. Such a bomb, active particles into the upper air. They sink gradually and reach the surface of the earth in the form of a deadly dust or rain. It was this dust which infected the Japanese fishermen and their catch of fish, although they were outside what the American experts believed to be the danger zone. No one knows how widely such lethal radio-active particles might be diffused, but the best authorities are unanimous in saying that a war with hudrogen bombs is quite likely to put an end to the human race. It is feared that if many hydrogen bombs are used there will be universal death. sudden onl for a fortunate minority, but for the majority a slow torture of disease and disintegration.	Teacher runs the MMC and runs the suitable CD-ROM Titles containing the necessary dictionary He then asks the students to search for the words themselves on the CD and note down any other related items which interests them.	**MMC** **IDC &** **PDC >**	Students search for the meaning of the difficult words & refers to many other words which are related to the topic and comes up as marked lateral reference to the words searched for. **Dictionary Meaning & Pronunciation (RP)** Destroy Fisherman	Compre- hension Kn Sp

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
Here, then is the problem which I present to you, stark and dreadful and inescapable : shall we put an end to the human race; or shall manking renounce war ? People will not face this alternative beacuse it is so demand distasteful limitations of national sovereignty. But what perhaps impedes understanding of the situation more than anything else is that the term 'manking' fells vagure and absrtact. People scarcely realize in imagination that the danger is to themselves and their children and their grandchildren, and not only to dimly apprehended humanity. And so they hope that perhaps war may be allowed to continue provided modern weapons are prohibited. I am afraid this hope is illusoty. What ever agreements not to use hydrogen bombs had been reached in time of peace, they would no longer be considered binding in time of war, and both sides would set to work to manufacture hydrogen bombs as soon as war broke out, for if one side that manutactured them would inevitably be victorious.		**EGC >**	**Grammar / Conjugation of Verbs** Renounce Bind continue **Picture association of words:** Hiroshima Japan apply extermination Japan London	Kn Wr Vocab. kw Sp. Read.

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
On both sides of the Iron Curtain there are political obstacles to emphasise on the destructive character of future war. If either side were to announce that it would on no account resort to war, it would be diplomatically at the mercy of the other side. Each side, for the sake of self-preservation, must continue to say that there are provocations that it will not endure. Each side may long for an accommodation, but neither side dare express this longing convincingly. The position is analogous to that of duellists in former times. No doubt it frequently happened that each of the duellists feared death and desired an accommodation, but neither could say so, since, if he did, he would be thought a coward. The only hope in such cases was intervention by firends of both parties suggesting an accomdation to which both could agree at the same moment. This is an exact analogy to the present position of the protagonists on either side of the	**The teacher** then asks the students to refer to Multimedia Encyclopedia and search the words selected by them or any other idea / concept which they feel interested about.	MMC MEC>	**The students** run the *Infopedia* Encyclopedia and refer to the following words & other related information : Hydrogen Bomb -Earth Radio-active	Vocab. Sp. Reading Writ.

Text Flow	Teachers' Activity	TA Used	Students' Activity	*Learning* Outcome
the Iron Curtain. If an agreement making war improbable is to be reached, it will have to by by the friendly offices of neutrals, who can speak of the disastrousness of war without being accused of advocation a policy of 'appeasement'. The neutrals have every right, even from the narrowest consideration of self-interest, to do whatever lies in their power to prevent the outbreak of a world war, for if such a war does break out, it is highly probable that all the inhabitants of neutral countries, along with the rest ot manking, will perish. If I were in control of a neutral government, I should certainly consider it my paramount duty to see to it that my country would continue to have inhabitants and the only way by which I could make this probable would be to *promote some kind of accommodation* between the powers on oppsite sides of the Iron Curtain.		Thesaurus > **MEC ≥**		Vocab. Wr. Sp. Kw.

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
As geological time is reckoned, Man has so far existed only for a very short period-1,000,000 years at the most. What he has achieved, especially during the last 6,000 years, is something utterly new in the history of the Cosmos, so far at least as we are acquainted with it. For countless ages the sun fose and set, the moon waxed and waned, the stars shone in the night, but it was only with he coming of Man that these things were understood, In the great world of astrononmy and in the little world of the atom, Man has unveiled secrets which might have been thought undiscoverable. In art and literature and religion, some men have shown a sublimity of feeling which makes the species worth preserving, Is all this to end in trivial horror beacuse so few are able to think of Man rather than of this ofr that group of men ?		Thesaurus > **MEC >**		Vocab. Vocab. Sp. Wr.

Text Flow	Teachers' Activity	TA Used	Students' Activity	Learning Outcome
Is our race so destitute of wisdom, so incapable of impartial love, so blind even to the simplest dictates of self preservation that the last proof of its silly cleverness is to be the extermination of all life on our planet ?			Cont'd.	

Follow up	The teacher will give the students a pre-recorded audio-cassette for listening practice in their own leisure hour & answering some questions based on the audio-tape	<TR		Listen. Pronun. Wr. Sp.

APPENDIX- J

Pre- and Post Test Question Bank
(TOEFL TYPE)

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Model Test 1
Short Form

Section 1:
Listening Comprehension

50 QUESTIONS 40 MINUTES

In this section of the test, you will have an opportunity to demonstrate your ability to understand spoken English. There are three parts to this section, with special directions for each part. Do not read ahead or turn the pages while the directions are being read. Do not take notes or write in your test book at any time.

Note: The transcript for the Listening Comprehension Section can be found on pages 601–606; the audiocassettes for the listening section can be purchased separately from this book. To order the audiocassettes, use the order form on page 645.

Part A

Directions: For each question in Part A, you will hear a short sentence. Each sentence will be spoken just once. The sentences you hear will not be written out for you.

After you hear a sentence, read the four choices in your test book, marked (A), (B), (C), and (D), and decide which one is closest in meaning to the sentence you heard. Then on your answer sheet, find the number of the question and fill in the space that corresponds to the letter of the answer you have chosen. Fill in the space so that the letter inside the oval cannot be seen.

1. (A) Mrs. Black spent $20.
   (B) Mrs. Black saved $16.
   (C) Mrs. Black paid too much.
   (D) Mrs. Black saved $4.

2. (A) The man is a lawyer.
   (B) The man is a teacher.
   (C) The man is a writer.
   (D) The man is a businessman.

3. (A) She forgot to meet us.
   (B) We took her to the airport.
   (C) No one met her because it was short notice.
   (D) She was very considerate to meet us.

4. (A) The brothers look alike.
   (B) The men look alike, but they are not brothers.
   (C) They do not look alike even though they are brothers.
   (D) They do not look alike because they are not brothers.

5. (A) Now she takes one tablet.
   (B) Now she takes two tablets.
   (C) Now she takes three tablets.
   (D) Now she takes four tablets.

6. (A) I would like some orange juice now.
   (B) I like orange juice, but I do not want any now.
   (C) I never want orange juice again.
   (D) I am never tired of orange juice.

1 1 1 1 1 1 1 1 1 1 1

7. (A) He is at a bank.
(B) He is at a grocery store.
(C) He is at a restaurant.
(D) He is at a post office.

8. (A) It was not late when we called you.
(B) It was late, so we did not call you.
(C) It was late, but we called you.
(D) It was not late, but we did not call you.

9. (A) We arrived after two o'clock.
(B) We arrived just as the game began.
(C) We arrived in the middle of the first half.
(D) We arrived too late for the game.

10. (A) Ron and Paul do not like each other.
(B) Ron and Paul are friends.
(C) Ron always takes Paul along with him.
(D) Ron and Paul are healthy.

11. (A) Tom will ask them to admit him on Monday.
(B) Tom will decide whether to go to school.
(C) Tom will know about his admission on Monday.
(D) They will decide whether to give Tom a scholarship.

12. (A) I don't think we should see the movie.
(B) You don't think we should see the movie, do you?
(C) You and I are not in agreement about the reviews of the movie.
(D) I think we should see the movie.

13. (A) Joe came to town by bus.
(B) Joe did not come to my house.
(C) Joe came to my house by bus.
(D) Joe came to town by taxi.

14. (A) Gary expects to work hard in order to finish his thesis.
(B) Gary is planning a party.
(C) Gary will finish his thesis at the party.
(D) Gary plans to start studying next quarter.

15. (A) He is tired.
(B) He did not go on vacation.
(C) He did not want to go on vacation because he was tired.
(D) He will take his vacation now.

16. (A) Older people can still go to school.
(B) Older people should not go to school.
(C) It is too late to go to school.
(D) He will not go back to school because it is too late.

17. (A) Mary was out of town.
(B) Mary ate without her husband today.
(C) Mary and her husband ate lunch in town today.
(D) Mary usually eats alone.

18. (A) She planned to write a poem.
(B) She planned to write a book.
(C) She wrote a poem.
(D) She does not like to write.

19. (A) Jean works at a nursery.
(B) Jean's children are sick.
(C) Jean's children stay in a nursery while she goes to the university.
(D) Jean takes her children to the university with her.

20. (A) It took three extra hours to get there.
(B) It usually takes three hours to get there.
(C) We usually have a flat tire.
(D) It usually takes longer to get there.

1 1 1 1 1 1 1 1 1 1 1

Part B

Directions: In Part B you will hear short conversations between two people. After each conversation, a third person will ask a question about what was said. You will hear each conversation and question about it only one time. After you hear a conversation and the question about it, read the four possible answers in your test book and decide which one is the best answer to the question you heard. Then, on your answer sheet, find the number of the question and fill in the space that corresponds to the letter of the answer you have chosen.

21. (A) At a drugstore.
(B) At a doctor's office.
(C) At a hospital.
(D) At a dentist's office.

22. (A) By car.
(B) By bus.
(C) Standing up.
(D) No, he doesn't.

23. (A) Japanese.
(B) American.
(C) Chinese.
(D) English.

24. (A) Treasurer.
(B) Vice-president.
(C) President.
(D) Secretary.

25. (A) That the woman should not consider her advisor in the decision.
(B) That the woman should not take Dr. Sullivan's section.
(C) That the woman's advisor will not be offended.
(D) That the woman should not take a physics course

26. (A) In an apartment on University Avenue.
(B) In an apartment in the city.
(C) In a house in the city
(D) At the university.

27. (A) That she would correct the exams.
(B) That her teaching assistant would correct the exams.
(C) That she would collect the exams
(D) That she would not give her students a final exam.

28. (A) Go to a dance.
(B) Go to the Student Center.
(C) Go to a lecture.
(D) Stay at home.

29. (A) Five years old.
(B) Four years old.
(C) Six years old.
(D) It is new.

30. (A) She wants to fix supper.
(B) She wants to stay at home.
(C) She is not hungry.
(D) She wants to go out.

31. (A) At his office.
(B) At lunch.
(C) At the travel agency.
(D) At the bakery.

32. (A) Student-Teacher.
(B) Client-Lawyer.
(C) Waitress-Customer.
(D) Patient-Doctor.

33. (A) Something cold
(B) Coffee.
(C) Tea.
(D) Both coffee and tea.

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1 1 1 1 1 1 1 1 1 1 1

34. (A) One baby.
(B) None.
(C) Three women.
(D) Three women and one baby.

35. (A) Yes, it is too far to walk.
(B) No, it is within walking distance.
(C) No, but it is too far to walk.
(D) Yes, you must take a bus or a taxi.

Part C

Directions: In this part of the test, you will hear longer conversations and talks. After each conversation or talk, you will be asked some questions. You will hear the talks and conversations and the questions about them only one time. They will not be written out for you.

After you hear a question, read the four possible answers in your test book and decide which one is the best answer to the question you heard. Then, on your answer sheet, find the number of the question and fill in the space that corresponds to the letter of the answer you have chosen. Answer all questions on the basis of what is stated or implied by the speakers in the talk or conversation.

36. (A) A slow, soft song.
(B) Music in restaurants.
(C) Background music.
(D) A pleasant addition to the environment.

37. (A) Thirteen percent.
(B) Five to ten percent.
(C) One hundred percent.
(D) Thirty percent.

38. (A) Background music that is low in stimulus value.
(B) Upbeat music that stimulates sales.
(C) Music engineered to reduce stress.
(D) Music that starts slow and gets faster at times of the day when people get tired.

39. (A) It can cause shoppers to go through the line faster.
(B) It can cause shoppers to buy thirty percent more or less.
(C) It can cause shoppers to walk slower and buy more.
(D) It does not influence sales.

40. (A) Soft music.
(B) Loud music.
(C) Slow music.
(D) Fast music.

41. (A) The speakers wanted coffee.
(B) The man lost money.
(C) The Student Center was crowded.
(D) The woman needed to make a phone call.

42. (A) The time.
(B) The money.
(C) The coffee.
(D) The test.

43. (A) They decided that they did not want any coffee.
(B) They thought that the Student Center would be closed.
(C) They thought that the Student Center would be crowded.
(D) The man lost his money in the vending machine.

44. (A) To study for a test.
(B) To use the telephone.
(C) To complain about the vending machine.
(D) To get a cup of coffee from the vending machine.

45. (A) The relationship between language and culture.
(B) The culture of Hopi society.
(C) American Indian cultures.
(D) The life of Benjamin Lee Whorf.

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46. (A) *A Handbook of American Indian Languages.*
(B) *The Technology Review.*
(C) *Language.*
(D) *Linguistic Patterns*

47. (A) Boas.
(B) Sapir.
(C) Franz.
(D) Yale.

48. (A) European languages.
(B) South American languages.
(C) American Indian languages.
(D) Computer languages.

49. (A) All languages are related.
(B) All American Indian languages are related.
(C) Language influences the manner in which an individual understands reality.
(D) Language and culture are not related.

50. (A) The Sapir Hypothesis.
(B) The Sapir-Whorf Hypothesis.
(C) The Sapir-Whorf-Boas Hypothesis.
(D) The American Indian Model of the Universe.

THIS IS THE END OF THE LISTENING COMPREHENSION SECTION OF TOEFL MODEL TEST 1.

DO NOT READ OR WORK ON ANY OTHER SECTION OF THE TEST.

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Section 2:
Structure and Written Expression

40 QUESTIONS 25 MINUTES

This section is designed to measure your ability to recognize language that is appropriate for standard written English. There are two types of questions in this section, with special directions for each type.

Part A

Directions: Questions 1–15 are incomplete sentences. Beneath each sentence you will see four words or phrases, marked (A), (B), (C), and (D). Choose the one word or phrase that best completes the sentence. Then, on your answer sheet, find the number of the question and fill in the space that corresponds to the letter of the answer you have chosen. Fill in the space so that the letter inside the oval cannot be seen.

1. Political demonstrations on American campuses have abated _____.

   (A) after 1970
   (B) in 1970
   (C) for 1970
   (D) since 1970

2. Ancient civilizations such as those of the Phoenicians and the Mesopotamians _____ goods rather than use money.

   (A) use to trade
   (B) is used to trade
   (C) used to trade
   (D) was used to trade

3. Most Americans don't object _____ them by their first names.

   (A) that I call
   (B) to my calling
   (C) for calling
   (D) that I am call

4. North Carolina is well known not only for the Great Smoky Mountains National Park, _____ for the Cherokee Indian settlements.

   (A) also
   (B) and
   (C) but also
   (D) because of

5. General Grant had General Lee _____ him at Appomattox to sign the official surrender of the Confederate forces.

   (A) to meet
   (B) met
   (C) meet
   (D) meeting

6. If a ruby is heated it _____ temporarily lose its color.

   (A) would
   (B) will
   (C) does
   (D) has

7. _____ small specimen of the embryonic fluid is removed from a fetus, it will be possible to determine whether the baby will be born with birth defects.

   (A) A
   (B) That a
   (C) If a
   (D) When it is a

8. All of the people at the AAME conference are _____.

(A) mathematic teachers
(B) mathematics teachers
(C) mathematics teacher
(D) mathematic's teachers

9. To generate income, magazine publishers must decide whether to increase the subscription price or _____.

(A) to sell advertising
(B) if they should sell advertising
(C) selling advertising
(D) sold advertising

10. If it _____ more humid in the desert of the Southwest, the hot temperatures would be unbearable.

(A) be
(B) is
(C) was
(D) were

11. _____ Java Man, who lived before the first Ice Age, is the first manlike animal.

(A) It is generally believed that
(B) Generally believed it is
(C) Believed generally is
(D) That is generally believed

12. For the investor who _____ money, silver or bonds are good options.

(A) has so little a
(B) has very little
(C) has so few
(D) has very few

13. Prices for bikes can run _____ $250.

(A) as high as
(B) as high to
(C) so high to
(D) so high as

14. According to the conditions of my scholarship, after finishing my degree, _____.

(A) my education will be employed by the university
(B) employment will be given to me by the university
(C) the university will employ me
(D) I will be employed by the university

15. Travelers _____ their reservations well in advance if they want to fly during the Christmas holidays.

(A) had better to get
(B) had to get better
(C) had better get
(D) had better got

Part B

Directions: In questions 16–40, each sentence has four underlined words or phrases. The four underlined parts of the sentence are marked (A), (B), (C), and (D). Identify the one underlined word or phrase that must be changed in order for the sentence to be grammatically correct. Then, on your answer sheet, find the number of the question and fill in the space that corresponds to the letter of the answer you have chosen.

16. The duties of the secretary are to take the
(A) (B)
minutes, mailing the correspondence, and
(C)
calling the members before meetings.
(D)

17. If biennials were planted this year, they will be likely to bloom next year.
(A) (B) (C) (D)

18. The value of the dollar declines as the rate of
(A) (B) (C)
inflation raises
(D)

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19. Even though a member has drank too much
(A) (B)
the night before, the counselors at Alcoholics
(C)
Anonymous will try to convince him or her
(D)
to sober up and stop drinking again.

20. Anthropologists assert that many of the
early American Plains Indians did not
engage in planting crops but to hunt, living
(A) (B) (C)
primarily on buffalo meat.
(D)

21. The neutron bomb provides the capable of a
(A)
limited nuclear war in which buildings
(B) (C)
would be preserved, but people would be
(D)
destroyed

22. The differential attractions of the sun and the
moon have a direct effect in the rising and
(A) (B) (C)
falling of the tides.
(D)

23. Despite of the pills that are available, many
(A) (B)
people still have trouble sleeping.
(C) (D)

24. Before TV, the common man seldom never
(A)
had the opportunity to see and hear his
(B) (C)
leaders express their views.
(D)

25. If it receives enough rain at the proper time,
(A) (B)
hay will grow quickly, as grass.
(C) (D)

26. *Psychology Today* is interesting, informative,
(A) (B)
and it is easy to read.
(C) (D)

27. Before she died, Andrew Jackson's daughter,
(A)
who lives in the family mansion, used to take
(B) (C) (D)
tourists through her home.

28. It is essential that the temperature is not
(A)
elevated to a point where the substance
(B)
formed may become unstable and
(C)
decompose into its constituent elements.
(D)

29. Two of the players from the Yankees has
(A) (B)
been chosen to participate in the All Star
(C) (D)
game.

30. John Philip Sousa, who many people consider
(A) (B)
the greatest composer of marches, wrote his
(C)
music during the era known as the Gay 90s.
(D)

31. In order for one to achieve the desired results
in this experiment, it is necessary that he
(A)
work as fastly as possible.
(B) (C) (D)

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32 Whoever inspected this radio should have put
(A) (B) (C)
their identification number on the box
(D)

33 The new model costs twice more than last
(A) (B) (C)
year's model
(D)

34 The purpose of the United Nations,
(A)
broad speaking, is to maintain peace and
(B) (C)
security and to encourage respect for human
(D)
rights

35 It is an accepted custom for one to say
(A) (B)
"excuse me" when he sneezed
(C) (D)

36 Even though Miss Colombia lost the beauty
(A)
contest, she was still more prettier than the
(B) (C) (D)
other girls in the pageant

37. There have been little change in the patient's
(A) (B)
condition since he was moved to the inten-
(C) (D)
sive care unit

38 Although we are concerned about the prob-
(A)
lem of energy sources, we must not fail
(B)
recognizing the need for environmental
(C) (D)
protection

39 Because of the movement of a glacier,
(A)
the form of the Great Lakes was very slow
(B) (C) (D)

40 Professor Baker recommended that we are
(A)
present at the reception this afternoon in
(B)
order to meet the representatives from the
(C) (D)
Fulbright Commission

THIS IS THE END OF SECTION 2 OF TOEFL MODEL TEST 1

IF YOU FINISH BEFORE 25 MINUTES HAS ENDED, CHECK YOUR WORK ON SECTION 2 ONLY.

DO NOT READ OR WORK ON ANY OTHER SECTION OF THE TEST

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Section 3:
Vocabulary and Reading Comprehension

60 QUESTIONS 45 MINUTES

This section is designed to measure your comprehension of standard written English. There are two types of questions in this section, with special directions for each type.

Part A

Directions: In questions 1–30, each sentence has an underlined word or phrase. Below each sentence are four other words or phrases, marked (A), (B), (C), and (D). You are to choose the one word or phrase that best keeps the meaning of the original sentence if it is substituted for the underlined word or phrase. Then, on your answer sheet, find the number of the question and fill in the space that corresponds to the letter you have chosen. Fill in the space so that the letter inside the oval cannot be seen.

1. Library cards will expire when they are not used.,

   (A) cost more money
   (B) cease to be effective
   (C) be mailed to the holder's address
   (D) be continued automatically

2. As soon as the board of elections promulgates the list of candidates, a ballot is prepared.

   (A) informally discusses
   (B) quickly contacts
   (C) officially declares
   (D) critically reviews

3. Collections of opals and quartz are featured at the City Museum's annual exhibition of precious stones.

   (A) coins
   (B) loot
   (C) gems
   (D) shells

4. Because of a long drought, Midwestern farmers are doubtful about the prospect of a good yield.

   (A) sympathetic
   (B) intrepid
   (C) dubious
   (D) thrilled

5. A compound break is more serious than a simple one because there is more opportunity for loss of blood and infection.

   (A) bruise
   (B) sprain
   (C) burn
   (D) fracture

6. If a client insists upon being stubborn, lawyers have to take claims to court.

   (A) obstinate
   (B) indignant
   (C) abject
   (D) gauche

7. Psychologists encourage their patients not to get upset about trivial matters.

   (A) unexpected
   (B) unusual
   (C) unimportant
   (D) uncertain

8. The street lights in most American cities adjust automatically at dusk.

(A) in the middle of the night
(B) in the middle of the day
(C) in the evening just before dark
(D) in the morning just before light

9. Professor Baker is a co-worker of Professor Ayers

(A) an advocate
(B) a disciple
(C) a rival
(D) a colleague

10. It is much easier to talk about social change than it is to make it happen.

(A) acknowledge it
(B) predict it
(C) bring it about
(D) put up with it

11. In frogs and toads, the tongue is fixed to the front of the mouth in order to facilitate projecting it at some distance, greatly aiding in the capture of insects.

(A) rotating
(B) protruding
(C) vibrating
(D) contracting

12. A thrifty buyer purchases fruits and vegetables in season.

(A) healthy
(B) disinterested
(C) careful
(D) professional

13. Madame Curie was completely engrossed in her work

(A) disturbed
(B) absorbed
(C) fatigued
(D) successful

14. Strive for excellence.

(A) Cooperate with others
(B) Be patient
(C) Make efforts
(D) Pay well

15. The value of an old item increases with time.

(A) a facsimile
(B) a bonus
(C) an antique
(D) an original

16. Frontier settlements had to depend on the cavalry.

(A) visit
(B) trust
(C) meet
(D) help

17. It is very discourteous to intrude during someone's conversation.

(A) find fault
(B) disagree
(C) be in the way
(D) leave quickly

18. In some states drivers are fined $100 for careless driving.

(A) routine
(B) reckless
(C) adept
(D) aggressive

19. In certain types of poisoning, immediately give large quantities of soapy or salty water in order to induce vomiting.

(A) control
(B) clean
(C) cause
(D) stop

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20. Feeling irritable may be a side effect of too much medication.

(A) drowsy
(B) grouchy
(C) dizzy
(D) silly

21. A series of columns supporting a large porch is typical of the architecture of pre-Civil War mansions in the South.

(A) statues
(B) murals
(C) pillars
(D) arches

22. Preservatives are added to bread to keep it from getting stale.

(A) small
(B) flat
(C) old
(D) wet

23. That a driver swerves in order to avoid an accident can be proven by examining the marks on the pavement.

(A) turns sharply
(B) stops quickly
(C) hits something else
(D) goes backwards

24. Even as a child Thomas Edison had a very inquisitive mind; at the age of three he performed his first experiment.

(A) complex
(B) brilliant
(C) mature
(D) curious

25. Mark Anthony's eulogy of Caesar at his funeral is memorably recorded in a play by Shakespeare.

(A) prayer
(B) biography
(C) praise
(D) denunciation

26. Flatboats ferry cars on the Great Lakes between the United States and Canada.

(A) transport
(B) inspect
(C) pursue
(D) detain

27. Drink only tepid liquids

(A) slightly warm
(B) very hot
(C) slightly cool
(D) very cold

28. The TOEFL examination will begin precisely at eight-thirty.

(A) exactly
(B) usually
(C) occasionally
(D) monthly

29. The other members of the Cabinet made fun of the Secretary of Interior when he purchased Alaska because, at the time, it was not considered valuable.

(A) admired
(B) derided
(C) envied
(D) endorsed

30. Most competitions are not open to both professionals and nonprofessionals.

(A) aliens
(B) juniors
(C) amateurs
(D) tutors

GO ON TO THE NEXT PAGE

Part B

Directions In the rest of this section you will read several passages Each one is followed by several questions about it For questions 31 60, you are to choose the one best answer, (A), (B), (C), or (D), to each question Then on your answer sheet, find the number of the question and fill in the space that corresponds to the letter of the answer you have chosen

Answer questions following a passage on the basis of what is stated or implied in that passage

Questions 31 36

It has long been known that when exposed to light under suitable conditions of temperature and moisture the green parts of plants use carbon dioxide from the atmosphere and release oxygen to it These exchanges are the opposite of those that occur in respiration The process is called photosynthesis In photosynthesis, carbohydrates are synthesized from carbon dioxide and water by the chloroplasts of plant cells in the presence of light Oxygen is the product of the reaction For each molecule of carbon dioxide used, one molecule of oxygen is released A summary chemical equation for photosynthesis is

$$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$$

As a result of this process, radiant energy from the sun is stored as chemical energy In turn the chemical energy is used to decompose carbon dioxide and water The products of their decomposition are recombined into a new compound, which is successively built up into a more and more complex substance After many intermediate steps sugar is produced At the same time a balance of gases is preserved in the atmosphere

31 Which title best expresses the ideas in this passage?

(A) A Chemical Equation
(B) The Process of Photosynthesis
(C) The Parts of Vascular Plants
(D) The Production of Sugar

32 In photosynthesis water

(A) must be present
(B) is produced in carbohydrates
(C) is stored as chemical energy
(D) interrupts the chemical reaction

33 The combination of carbon dioxide and water to form sugar results in an excess of

(A) water
(B) oxygen
(C) carbon
(D) chlorophyll

34 Which process is the opposite of photosynthesis?

(A) Decomposition
(B) Synthesization
(C) Diffusion
(D) Respiration

CONTINUED ON NEXT PAGE

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35. In photosynthesis, energy from the sun is

(A) changed to chemical energy
(B) conducted from the xylem to the leaves of green plants
(C) not necessary to the process
(D) released one to one for each molecule of carbon dioxide used

36. Besides the manufacture of food for plants, what is another benefit of photosynthesis?

(A) It produces solar energy.
(B) It diffuses additional carbon dioxide into the air.
(C) It maintains a balance of gases in the atmosphere.
(D) It removes harmful gases from the air.

Questions 37–42

The Nobel prizes, awarded annually for distinguished work in chemistry, physics, physiology or medicine, literature, and international peace, were made available by a fund bequeathed for that purpose by Swedish philanthropist, Alfred Bernhard Nobel.

Line The prizes, awarded since 1901, are administered by the Nobel Foundation in Stockholm.
(5) In 1969, a prize for economics endowed by the Central Bank of Sweden was added. Candidates for the prizes must be nominated in writing by a qualified authority in the field of competition. Candidates are judged by Swedish and Norwegian academies and institutes on the basis of their contribution to mankind. The awards are usually presented in Stockholm on December 10, with the King of Sweden officiating, an appropriate tribute to Alfred Nobel on the *(10)* anniversary of his death. Each prize includes a gold medal, a diploma, and a cash award of about one million dollars.

37. What does this passage mainly discuss?

(A) Alfred Bernhard Nobel
(B) The Nobel prizes
(C) Great contributions to mankind
(D) Swedish philanthropy

38. How often are the Nobel prizes awarded?

(A) Five times a year
(B) Once a year
(C) Twice a year
(D) Once every two years

39. A Nobel prize would NOT be given to

(A) an author who wrote a novel
(B) a doctor who discovered a vaccine
(C) a composer who wrote a symphony
(D) a diplomat who negotiated a peace settlement

40. Why were the prizes named for Alfred Bernhard Nobel?

(A) He left money in his will to establish a fund for the prizes.
(B) He won the first Nobel prize for his work in philanthropy.
(C) He is now living in Sweden.
(D) He serves as chairman of the committee to choose the recipients of the prizes.

41 Which individual or organization serves as administrator for the trust?

(A) The King of Sweden
(B) The Nobel Foundation
(C) The Central Bank of Sweden
(D) Swedish and Norwegian academies and institutes

42 Why are the awards presented on December 10?

(A) Because it is a tribute to the King of Sweden
(B) Because Alfred Bernhard Nobel died on that day
(C) Because that date was established in Alfred Nobel's will
(D) Because the Central Bank of Sweden administers the trust

Questions 43–48

Although stage plays have been set to music since the era of the ancient Greeks, when the dramas of Sophocles and Aeschylus were accompanied by lyres and flutes, the usually accepted date for the beginning of opera as we know it is 1600. As part of the celebration of the marriage of King Henry IV of France to the Italian aristocrat Maria de Medici, the Florentine composer Jacopo Peri produced his famous *Euridice*, generally considered to be the first opera. Following his example, a group of Italian musicians, called the Camerata, began to revive the style of musical story that had been used in Greek tragedy.

For several years, the center of opera was Florence, but gradually it spread throughout Italy and into Europe. The European form de-emphasized the dramatic aspect. New orchestral effects and even ballet were introduced under the guise of opera. Composers gave in to the demands of singers, writing many operas that were nothing more than a succession of brilliant tricks for the voice. Airs, recitatives, and duets evolved. The air, which is a long solo, may be compared to a song. The recitative, which is also a solo, is a recitation set to music, whereas the duet is a musical piece written for two voices.

43 This passage is a summary of

(A) opera in Italy
(B) the Camerata
(C) the development of opera
(D) *Euridice*

44 According to the author, what did Jacopo Peri write?

(A) Greek tragedy
(B) The first opera
(C) The opera *Maria de Medici*
(D) The opera *The Camerata*

45 The author suggests that *Euridice* was produced

(A) in France
(B) originally by Sophocles and Aeschylus
(C) without much success
(D) for the wedding of King Henry IV

46 What was the Camerata?

(A) A group of Greek musicians
(B) Musicians who developed a new musical drama based upon Greek drama
(C) A style of music not known in Italy
(D) The name given to the court of King Henry IV

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47 According to this passage, when did modern opera begin?

(A) In the time of the ancient Greeks
(B) In the fifteenth century
(C) At the beginning of the sixteenth century
(D) At the beginning of the seventeenth century

48 Which of the following is an example of a solo?

(A) A recitative
(B) A duet
(C) An opera
(D) A lyre

Questions 49–54

According to the controversial sunspot theory, great storms on the surface of the sun hurl streams of solar particles into the atmosphere, causing a shift in the weather on earth.

A typical sunspot consists of a dark central umbra surrounded by a lighter penumbra of
Line light and dark threads extending out from the center like the spokes of a wheel. Actually, the
(5) sunspots are cooler than the rest of the photosphere, which may account for their color. Typically, the temperature in a sunspot umbra is about 4000 K, whereas the temperature in a penumbra registers 5500 K, and the granules outside the spot are 6000 K.

Sunspots range in size from tiny granules to complex structures with areas stretching for billions of square miles. About 5 percent of the spots are large enough so that they can be seen
(10) without instruments; consequently, observations of sunspots have been recorded for several thousand years.

Sunspots have been observed in arrangements of one to more than one hundred spots, but they tend to occur in pairs. There is also a marked tendency for the two spots of a pair to have opposite magnetic polarities. Furthermore, the strength of the magnetic field associated with
(15) any given sunspot is closely related to the spot's size.

Although there is no theory that completely explains the nature and function of sunspots, several models attempt to relate the phenomenon to magnetic fields along the lines of longitude from the north and south poles of the sun.

49 What is the author's main purpose in the passage?

(A) To propose a theory to explain sunspots
(B) To describe the nature of sunspots
(C) To compare the umbra and the penumbra in sunspots
(D) To argue for the existence of magnetic fields in sunspots

50 Solar particles are hurled into space by

(A) undetermined causes
(B) disturbances of wind
(C) small rivers on the surface of the sun
(D) changes in the earth's atmosphere

51 The sunspot theory is

(A) not considered very important
(B) widely accepted
(C) subject to disagreement
(D) relatively new

52 How can we describe matter from the sun that enters the earth's atmosphere?

(A) Very small
(B) Very hot
(C) Very bright
(D) Very kind

53. In which configuration do sunspots usually occur?

(A) In one spot [illegible] size
(B) In a configuration [illegible] spots
(C) In an arrangement [illegible] more spots
(D) In groups of several [illegible] spots

54. How are sunspots explained?

(A) Sunspots appear to be related to magnetic fields on the earth
(B) Sunspots may be related to magnetic fields that follow longitudinal lines on the sun
(C) Sunspots are explained by storms that occur on the earth
(D) Sunspots have no theory or model to explain them

Questions 55–60

Recent technological advances in manned and unmanned undersea vehicles have overcome some of the limitations of divers and diving equipment. Without a vehicle, divers often became sluggish and their mental concentration was limited. Because of undersea pressure that affected their speech organs, communication among divers was difficult or impossible. But today, most oceanographers make observations by means of instruments that are lowered into the ocean or from samples taken from the water. Direct observations of the ocean floor are made not only by divers but also by deep-diving submarines. Some of these submarines can dive to depths of more than seven miles and cruise at depths of fifteen thousand feet. Radio-equipped buoys can be operated by remote control in order to transmit information back to land-based laboratories, including data about water temperature, currents and weather.

Some of mankind's most serious problems, especially those concerning energy and food, may be solved with the help of observations made possible by these undersea vehicles.

55. With what topic is the passage primarily concerned?

(A) Recent technological advances
(B) Communication among divers
(C) Direct observation of the ocean floor
(D) Undersea vehicles

56. Divers have had problems in communicating underwater because

(A) the pressure affected their speech organs
(B) the vehicles they used have not been perfected
(C) they did not pronounce clearly
(D) the water destroyed their speech organs

57. This passage suggests that the successful exploration of the ocean depends upon

(A) vehicles as well as divers
(B) radios that divers use to communicate
(C) controlling currents and the weather
(D) the limitations of diving equipment

58. Undersea vehicles

(A) are too small for a man to fit inside
(B) are very slow to respond
(C) have the same limitations that divers have
(D) make direct observations of the ocean floor

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59. How is a radio-equipped buoy operated?

(A) By operators inside the vehicle in the part underwater
(B) By operators outside the vehicle on a ship
(C) By operators outside the vehicle on a diving platform
(D) By operators outside the vehicle in a laboratory on shore

60. According to the author, what are some of the problems the underwater studies may eventually resolve?

(A) Weather and temperature control
(B) Food and energy shortages
(C) Transportation and communication problems
(D) Overcrowding and housing problems

THIS IS THE END OF SECTION 3 OF TOEFL MODEL TEST 1.

IF YOU FINISH BEFORE 45 MINUTES HAS ENDED, CHECK YOUR WORK ON SECTION 3 ONLY.

DO NOT READ OR WORK ON ANY OTHER SECTION OF THE TEST.

END OF TOEFL MODEL TEST 1.

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Test of Written English (TWE) Model Tests

When you take the model examinations, you should time them carefully. After you have read the topic, you should spend 30 minutes writing each model test. For results that would be closest to the actual testing situation, it is recommended that an English teacher score your test, using the guidelines on page 588 of this book.

Model Test 1

TOPIC: Many people enjoy participating in sports for recreation, others enjoy participating in the arts. Give the benefits of each, take a position, and defend it.

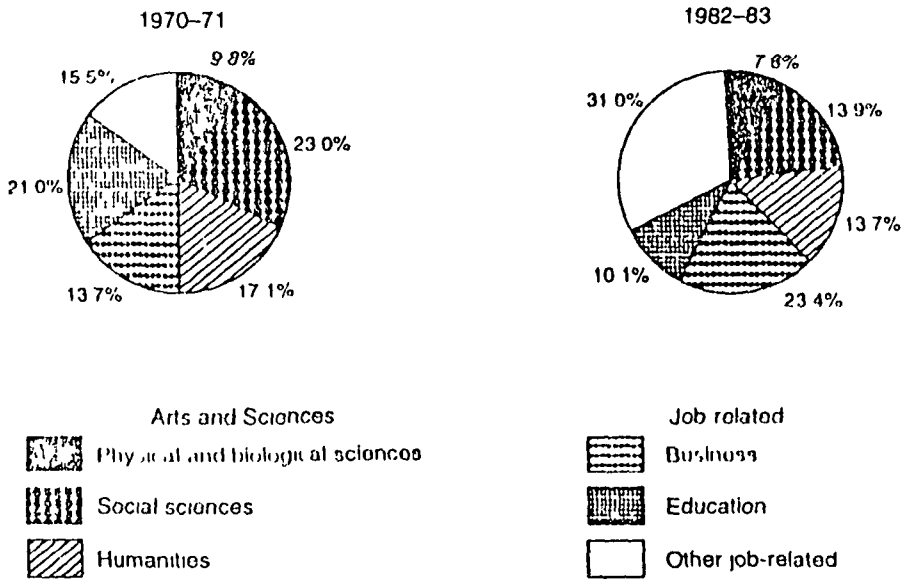
Notes

Model Test 2

TOPIC: Suppose you are assigned a report in which you must include the information from the charts on the next page. Show how the charts are related, and explain the conclusions that you have reached. Remember that the information in the charts must support your conclusions.

Notes

Bachelor's degrees conferred, by field



SOURCE Center for Statistics *Digest of Education Statistics* 1985–86
SOURCE Joyce D. Stern and Mary Frase Williams *The Condition of Education* Center for Educational Statistics
A Statistical Report Office of Educational Research and Improvement (1986)

Model Test 3

TOPIC Many people have learned a foreign language in their own country, others have learned a foreign language in the country in which it is spoken. Give the advantages of each and support your viewpoint.

Notes

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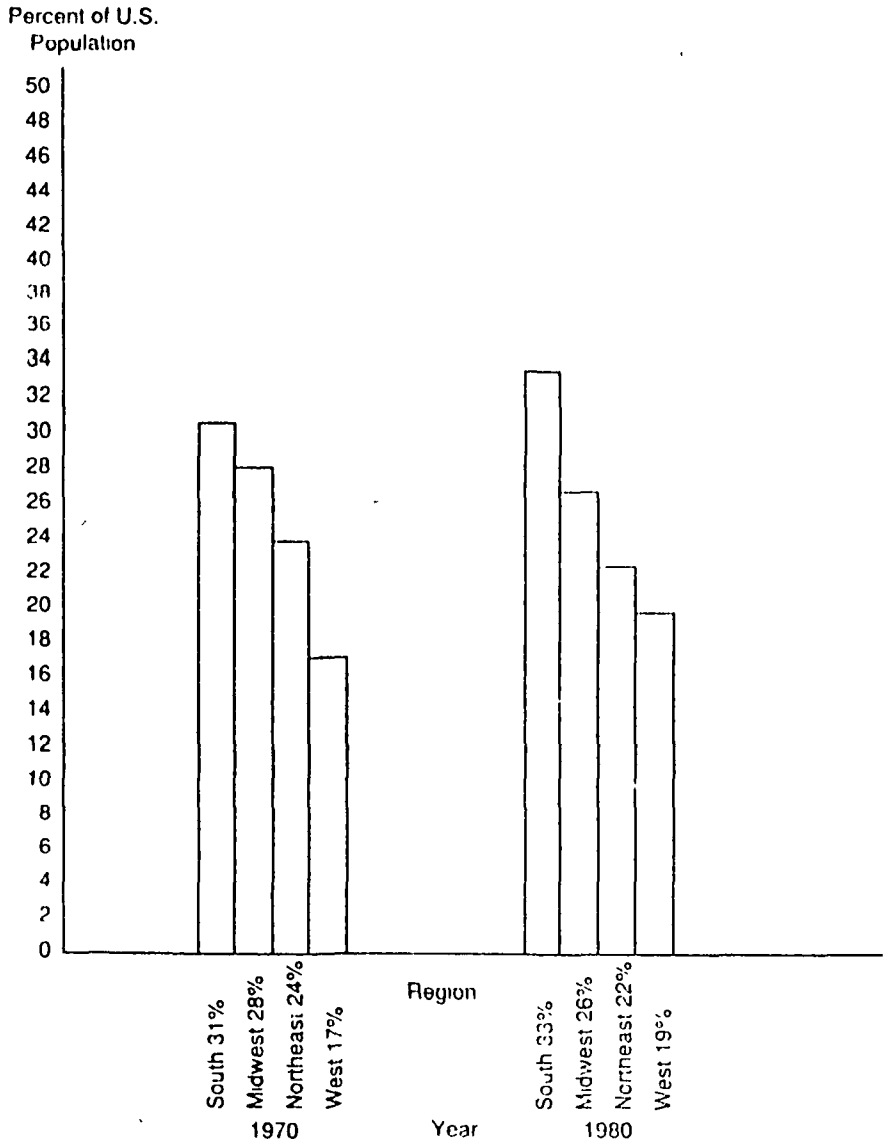
Model Test 4

TOPIC: Suppose that you must write a report that includes your interpretation of the information on the chart printed below. Explain the relationship between the two years and explain your conclusions. Be sure that the information in the chart will support your interpretation.

Notes



Source: Bureau of the Census, U.S. Department of Commerce, *National Data Book and Guide to Sources, Statistical Abstract of the United States 1980*.

Model Test 5

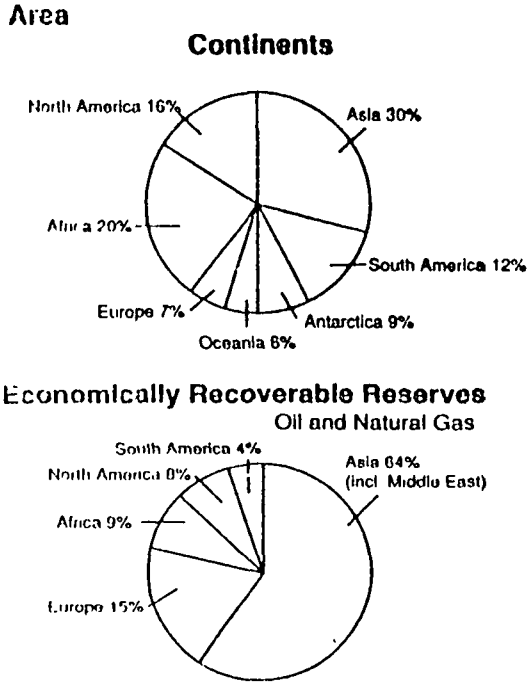
TOPIC: Some people believe that it is very important to make large amounts of money, while others are satisfied to earn a comfortable living. Analyze each viewpoint and take a stand.

Notes

Model Test 6

TOPIC: Suppose that you are asked to make a report in which you have to interpret the information in the charts printed below. Discuss how the charts are related and explain your conclusions. Be sure that the information in the charts supports your interpretation.

Notes



APPENDIX : K

STUDENTS' SCORE IN THE EXIT TEST

Code No	Exit Test Score (%) CONTROL GROUP	Code No	Exit Test Score (%) EXP. GROUP
C 01	18	E 01	42
C 02	18	E 02	48
C 03	32	E 03	46
C 04	26	E 04	48
C 05	30	E 05	48
C 06	22	E 06	46
C 07	30	E 07	46
C 08	24	E 08	44
C 09	26	E 09	48
C 10	32	E 10	42
C 11	26	E 11	48
C 12	16	E 12	46
C 13	30	E 13	54
C 14	32	E 14	50
C 15	24	E 15	42
C 16	30	E 16	52
C 17	26	E 17	50
C 18	20	E 18	48
C 19	22	E 19	48
C 20	24	E 20	44
C 21	24	E 21	48
C 22	30	E 22	50
C 23	32	E 23	46
C 24	20	E 24	46
C 25	30	E 25	46
C 26	34	E 26	44
C 27	26	E 27	46
C 28	30	E 28	48
C 29	34	E 29	50
C 30	30	E 30	52
C 31	24	E 31	46
C 32	30	E 32	44
C 33	28	E 33	48
C 34	26	E 34	44
C 35	20	E 35	50
C 36	30	E 36	48
C 37	28	E 37	52
C 38	34	E 38	46
C 39	28	E 39	54
C 40	30	E 40	44
C 41	30	E 41	50
C 42	22	E 42	52
C 43	28	E 43	48
C 44	32	E 44	54
C 45	32	E 45	46
C 46	20	E 46	50
C 47	28	E 47	44
C 48	28	E 48	46
C 49	28	E 49	50
C 50	30	E 50	46
MEAN	27.08	Mean	47.56
SD	4.57	SD	3.08

APPENDIX: L

STUDENTS' SCORE IN THE EXIT TEST (Re-Experiment)

Code No	Exit Test Score (%) CONTROL GROUP	Code No	Exit Test Score (%) EXP. GROUP
C 01	22	E 01	35
C 02	31	E 02	30
C 03	21	E 03	37
C 04	35	E 04	36
C 05	22	E 05	37
C 06	17	E 06	32
C 07	19	E 07	31
C 08	29	E 08	35
C 09	18	E 09	29
C 10	20	E 10	32
C 11	23	E 11	29
C 12	11	E 12	31
C 13	21	E 13	32
C 14	10	E 14	41
C 15	27	E 15	37
C 16	15	E 16	35
C 17	22	E 17	29
C 18	31	E 18	30
C 19	19	E 19	32
C 20	33	E 20	42
C 21	20	E 21	32
C 22	29	E 22	36
C 23	24	E 23	31
C 24	21	E 24	35
C 25	24	E 25	28
C 26	23	E 26	23
C 27	22	L 27	37
C 28	18	E 28	36
C 29	30	E 29	24
C 30	17	E 30	30
C 31	19	E 31	35
C 32	10	E 32	23
C 33	27	E 33	31
C 34	9	E 34	23
C 35	22	E 35	36
C 36	14	E 36	41
C 37	29	E 37	30
C 38	12	E 38	32
C 39	19	E 39	37
C 40	12	E 40	27
C 41	34	E 41	31
C 42	14	E 42	24
C 43	20	E 43	36
C 44	8	E 44	37
C 45	28	E 45	27
C 46	18	E 46	30
C 47	21	E 47	23
C 48	23	E 48	28
C 49	12	E 49	31
C 50	19	E 50	27
Mean	20.84	Mean	31.86
SD	6.72	SD	4.83

APPENDIX: M

Statistical Calculations

A. Experiment (1)

Null Hypothesis (Ho) . There is no difference between the performance of control and experiment al group after the experimental teaching.

Alternative Hypothesis (H1) There is a difference between the performance of control and experimental group after experimental teaching.

As n>30 we apply 'Z' test or abnormality test.

$$Z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

~Z (0,1) standard and normal variance.

Where, $\bar{x}_1$ = mean score of experimental group. $\bar{x}_2$ = mean score of control group

s_1 = standard deviation of experimental group s_2 = standard deviation of cont. group.

n_1 =no of samples in experimental group n_2 = no of samples in control group.

Therefore, here $z = \frac{47.56 - 27.08}{\sqrt{\frac{(3.08)^2}{50} + \frac{(4.57)^2}{50}}} = \frac{20.48}{.76} = 26.95$

Critical value of Z for 0.01 level of significance is 2.58 and our calculated value is 26.95

Conclusion:

Since the table value of z is much lesser than our calculated value, we reject our null hypothesis and conclude that there is a highly significant difference between the score of control group and experimental group.

In other words, we can say that by use of new technologies in ELT classrooms, the learners have achieved greater / higher language ability in terms of overall English language skills.

B Re-experiment (2)

Null Hypothesis (Ho) There is no difference between the performance of control and experiment al group after the experimental teaching

Alternative Hypothesis (H1) There is a difference between the performance of control and experimental group after experimental teaching

As n>30 we apply 'Z' test or abnormality test.

$$Z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$ ~Z (0,1) standard and normal variance

Where, $\bar{x}_1$ = mean score of experimental group $\bar{x}_2$ = mean score of control group

s_1 = standard deviation of experimental group s_2 = standard deviation of cont group

n_1 = no of samples in experimental group n_2 = no of samples in control group

Therefore here $z = \frac{31{\cdot}86 - 20{\cdot}84}{\sqrt{\frac{(4{\cdot}83)^2}{50} + \frac{(16{\cdot}72)^2}{50}}} = \frac{11{\cdot}02}{1{\cdot}16} = 9{\cdot}50$

Critical value of Z for 0 01 level of significance is 2 58 and our calculated value is 9·50

Conclusion

Since the table value of z is much lesser than our calculated value, we reject our null hypothesis and conclude that there is a highly significant difference between the score of control group and experimental group

In other words, we can say that by use of new technologies in ELT classrooms, the learners have achieved greater / higher language ability in terms of overall English language skills