

A SUGGESTED ESP READING PROGRAMME FOR PREPARATORY CLASSES OF ENGLISH-MEDIUM ENGINEERING FACULTIES: A CASE STUDY

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ABSTRACT: This study aims to introduce a new path to prepare an ESP Reading Curriculum for the Preparatory Classes of English-medium Engineering Faculties in Turkey. To provide this, in 1996-1997 academic year, firstly, ESP reading programmes of some English-medium universities such as Middle East Technical University and Istanbul Technical University were examined and then an experimental research was held at Gazi University Preparatory Classes of Engineering and Architecture Faculty, and the results were illustrated via some statistical tables and figures.

For the research, two equal experimental groups of preparatory class students and a group of freshman students were selected at random. To begin with, as well as the freshman students, the subjects of the experimental groups were given a pre-test the questions of which were formed as a result of item analyses. Next, the proposed programme was implemented and consequently, the same test was administered as the post-test of the study. Finally, the results of the tests for the experimental groups and the freshman students were compared by means of a Scheffe Test.

KEY WORDS : *ESP reading curriculum, reading activities, english preparatory class training, engineering faculties.*

ÖZET: Bu çalışma, Türkiyedeki İngilizce eğitim veren mühendislik fakültelerinin hazırlık sınıflarına Özel Amaçlı bir İngilizce Okuma dersi hazırlamada yeni bir yol tanıtmayı amaçlamaktadır. Bunun için 1996-1997 öğretim yılında önce Orta Doğu Teknik Üniversitesi ve İstanbul Teknik Üniversitesi gibi İngilizce eğitim veren bazı üniversitelerin hazırlık sınıflarının özel amaçlı İngilizce okuma programları incelendi ve daha sonra da Gazi Üniversitesi Mühendislik-Mimarlık Fakültesi Hazırlık sınıflarında deneysel bir araştırma yapılarak sonuçlar istatistiksel tablolar ve rakamlarla gösterildi.

Bu araştırma için hazırlık sınıflarından birbirine denk iki deney grubu ve birinci sınıflardan da bir grup öğrenci rastgele seçildi. İlk önce, hem birinci sınıf öğrencilerine hem de hazırlık sınıflarındaki deneklere madde analizleri

yapılmış olan bir ön test verildi. Daha sonra, bu çalışmada önerilen Özel Amaçlı Okuma programı uygulandı ve bunun sonucunda aynı test çalışmanın son testi olarak yeniden verildi. En sonunda da, hazırlık sınıflarındaki ve birinci sınıftaki deneklerin başarıları Scheffe testi ile karşılaştırıldı.

ANAHTAR SÖZCÜKLER : *Özel amaçlı okuma programı, okuma etkinlikleri, ingilizce hazırlık sınıfı eğitimi, mühendislik fakülteleri.*

1. INTRODUCTION

A great deal of attention has been given, for ages, to the development of classroom teaching techniques. Similarly, there has been a growth of interest in the language teaching materials, of which the production of ESP materials is relatively minor part. However, in some circumstances, it is crucial that both General and Specific Language Teaching Procedure be paid equal attention for a beneficial and fruitful language training process. For instance, an engineer may need to express some mathematical or chemical concepts in English as well as some social ones. Then, it can be claimed that Engineering students are in need of gaining the social, mathematical and scientific terminology in English during their University training period. This research aims to be of service to the English Language teachers whose objective is to develop reading skills of Preparatory Class students at English-medium Engineering Faculties in Turkey.

The ultimate purpose of the study is to open a path to choose or prepare a functional and practical ESP reading material for the students in that they

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will have the opportunity to gain both general reading skills and the knowledge of the English terminology related to Mathematics, Physics and Chemistry, all of which are the basic constituents of the first year programme in their main departments. Thus, it is believed that such a programme will enable the students to follow the courses with ease in their departments after one academic-year Preparatory Class training.

2. REVIEW OF LITERATURE

Traditionally, the majority of EFL activities in Turkey are known to concentrate on the secondary and university levels of national educational systems and on various types of language institutions. It is also a fact that with some exceptions, particularly at the Preparatory Class Education, which aims to prepare the students for their English-medium courses in the further classes and lasts about one academic year, most of this work has been characterised by an attempt to teach as much as possible of the system and components of English as a language for general purposes. Besides, it can be claimed that in recent years, however, there has been a considerable growth in the teaching of English for specific communicative needs, and of the specialised forms of English strongly associated with those needs. The reason for this growing interest to ESP can be stated as follows:

i. After the World War 2, enormous and unprecedented expansion in specific, technological and economic activity took place and consequently, the demand for an international language (English) occurred.

ii. In the late 1960s and early 1970s, a revolution in Linguistics took place, i.e., a great attention was paid to ways in which language is actually used in real communication,

iii. New developments were introduced in Educational Psychology, i.e., increasing emphasis on importance of learners' needs, interests, motivation, relevance of what and how they are learning was common.

iv. Demands from the professions for more relevant English courses got the linguists and methodologists to investigate new approaches.

Mean while, it cannot be denied that a specific programme requires some specific studies. For instance, Fredericks (1) says that "The primary purpose of an ESP language training programme should be to provide optimal learning opportunities for all students through recognition of and provision for each individual's unique patterns of growth and development." In addition, Waters [2] claims that "What is involved in an ESP programme could be said to have two main facets:

1. Adding an 'overlay' of the English particularly associated with the study of science;

2. Teaching communicative skills in this English and in the stock of general English already acquired." These point of views support the principle introduced in this study.

Furthermore, Tinkham [3] gives a situational example for the reason to design an ESP course containing general English as follows: "During the mid- 1970s the American government sold a large number of helicopters to Iran. In addition, American companies were contracted to teach Iranians to fly and maintain these helicopters. This technical training was conducted in English and required that Iranian students first learn sufficient English to receive the specific training". Similarly, Bensoussan and Golan [4] report that the students of Mathematics at Haifa University are required to read advanced Mathematical literature written in English. although these students are believed to have a basic reading knowledge of English, they find it difficult to cope with the specialized language and style of Mathematical texts. They say that "In order to improve the students' reading comprehension, we constructed a course which emphasizes the language characteristics of such texts." They also state that "Finally, we observe that specific attention to the logical discourse in Mathematics texts can improve reading comprehension."

Hence, it is easy to observe that all these examples reflect the significance of the learners' needs and wants in the Curriculum Development of ESP Reading. Likewise, Moorhouse [5] reports a fashion and crafts teachers' experiences as follows; "linked skills courses, which have developed in a few adult education centres in Inner London, as the name suggests, attempt to combine the teaching of a specific practical skill in conjunction with the literacy skills need to practice and extend that skill to an independent level". Therefore, it is safe to infer that as well as in Turkey, studies in various countries have proved that ESP students need to gain both basic knowledge of general English and some terminology related to their specific area in order to comprehend an English text in their fields of study.

3. PURPOSE OF THE STUDY

It is a widely known fact that needs should become the goals which a programme aims at, and the objectives are sets of conditions that have to be fulfilled before a goal can be attained. Hence, this study aims to introduce a new reading programme for the students of Engineering and Architecture to develop a policy to manipulate the general reading knowledge while tackling a mathematical or scientific problem in English or reading an English text related to these fields of study.

A group of freshman students from Gazi University Faculty of Engineering and Architecture in Turkey complained that they had difficulties in following the lessons in the medium of English in their main departments although they graduated from the English Preparatory Classes of the Faculty. They also explained that since they graduated from the state high schools and since they did not study Mathematics, Physics and Chemistry in English, they were not familiar with the English terminology of these disciplines.

These students had ESP courses during the Preparatory Class training. However, the ESP course in the Preparatory Class Programme was

composed of Technical English, in which they were taught some specific subjects such as parts of machines, road and building construction, features of electrical devices, and the like. In addition, in these courses the students were mostly assigned to memorize the related vocabulary in units as extensive reading activities. Yet, the students said that they would need such knowledge after the freshman, and they also claimed that they would forget those technical terms when they started the sophomore as they did not have the opportunity to review them during the freshman programme. According to their viewpoint, it would have been better for them if they had learned the essential terminology of Mathematics, Physics and Chemistry intensively.

In this study, the answers to the following questions are sought;

1. What are the students' opinion about the present ESP reading curriculum?
2. Are there any significant differences between the Preparatory Class students and the exempted students before and after the present and the proposed reading curriculums have been implemented?
3. Are there any significant differences between the students who have been taught by means of the ESP reading materials including Mathematics, Physics, Chemistry and general reading texts in the Preparatory Classes and the ones who are English-medium high school graduates and were exempted at the beginning of the academic year?
5. What are the components of the proposed model?

The results of the surveys showed that the Preparatory Class students of Gazi University Faculty of Engineering and Architecture needed to gain both reading skills and some basic knowledge of the mathematical and scientific terminology in English in order to be able to

comprehend and solve the problems in the related courses since the freshman programme of the Faculty was mainly made up of these disciplines in all departments. And if the goal was to read required Mathematical or Scientific texts of a particular length at a particular reading speed either to store as examinable knowledge or to interpret for action, then it could be assumed that the students needed to be at a certain state of performance ability that could be characterized by giving values to various reading skills.

Keeping the students' needs and English level in mind the new ESP reading programme is supposed to be intensive and start in the second semestre, when the students reach the intermediate level of basic English, and when they are believed to be ready to study reading for specific purposes. It is also suggested that the programme last 80 hours within 16 weeks besides the Basic English training. Likewise, Demirel [6] suggests that "At the intermediate level in the

reading courses the aim is to get information from what is read. This kind of reading is reading for exact information and thus intensive."

In short, it can be said that the purpose of the study is to make a positive and practical contribution to improving standards of ESP Reading related to Mathematics, Physics and Chemistry at Gazi University Faculty of Engineering and Architecture. When Demirel's (6) and Rivers' (7) definitions and explanations are examined, it is safe to diagram a procedural model of gaining the ability of decoding a Mathematical or Scientific text as follows (See Figure 1):

As is seen in Figure 1, the model involves a programme policy as well as a programme practice. The diagram attempts to illustrate what the reading skills are and how they could be presented. Consequently, a set of assumptions about the conditions for the reading success of the Preparatory Class students of the Engineering Faculty can be derived as in the following:

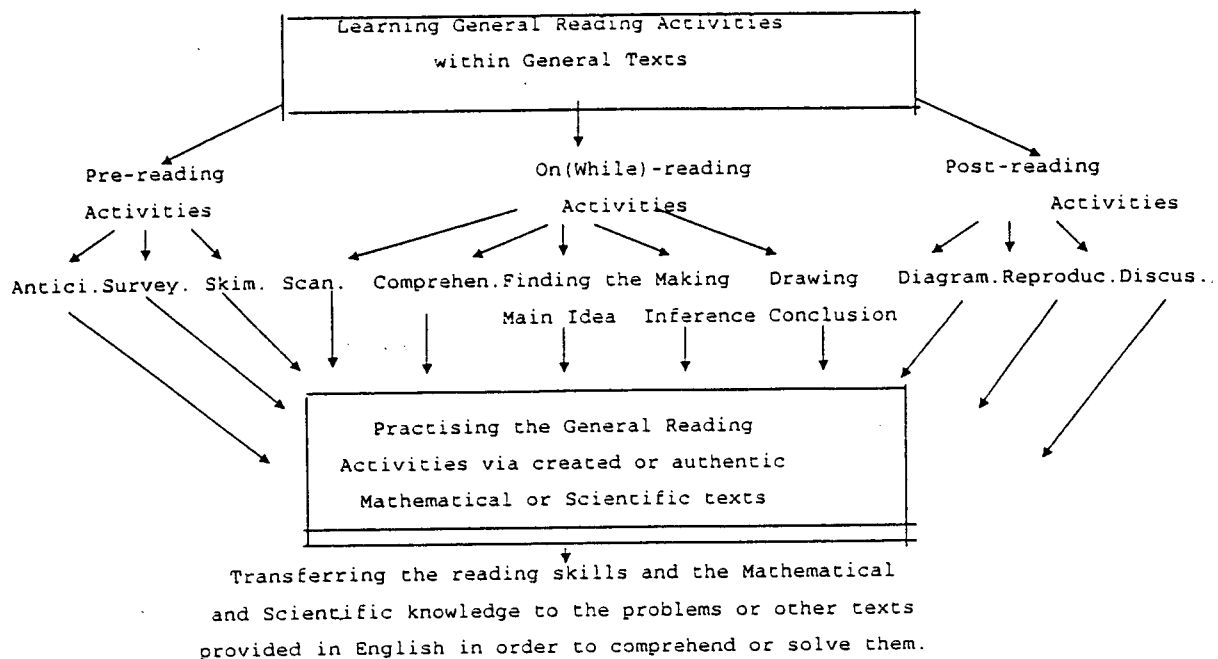


Figure 1: The procedural Model of Gaining the Ability of Decoding a Mathematical or Scientific Text

1. Textual substance is a set of variables that includes not only the separate elements of spelling conventions but also mathematical formulas and diagram display conventions and their complicated interplay in, for example, mathematical problems. Perceptual efficiency with regard to this interplay cannot be ignored; Turkish students appear to find Mathematical or Scientific problems in English difficult to process if they graduate from a state High School.

2. The ability to construct conceptual wholes from syntactic fragments is an important condition of reading success (Jones and Roe) (8).

In short, it can be concluded that the purpose of this study is to introduce a new ESP reading programme that will include both general reading skills and specific terminology according to the needs of the students. And in this study it is believed that the creation and decoding of a text involve the growth and modification of an information structure, therefore, it is thought that conceptual background should be seen as a network of information which is needed for a creative transformation. That is why the proposed programme includes both general and specific texts in order to enable the students to gain general and specific texts in order to enable the students to gain general reading skills and to transfer these skills to their specific studies.

4. PROCEDURE AND FINDINGS

The procedure and the findings of the study can be stated in sequence as follows:

To begin with, the subjects (for the Experimental Group I and II) were selected according to their success in 1996 University Entrance Examination and as a result of the t-Test it was observed that there were no significant differences between the two groups (See Figure 2).

Figure 2. t-tests for Paired Samples

Variables	N	Corr.	Mean	SD	t
Exp.Grp.I	25	,961	539,39	26,91	41
Exp. Grp.II	25	,961	538,78	26,75	

Meanwhile, the instructors of the Experimental groups were of the same age, had the same experience in ELT and had master degrees in the same year. Next, an observation survey was given to the subjects so as to obtain a more detailed information about them. The results of the analysis of the survey proved that there were no significant differences between the subjects in the Experimental Groups. Next, a multiple-choice ESP test with 50 questions measuring various reading skills was prepared by making use of several Mathematics, Physics and Chemistry coursebooks. Then, the test was given to 30 students who were exempted in the Proficiency Examination at the beginning of the 1996-1997 academic year as they were graduated from the English-medium High Schools. As a result of the item analysis a new test with 25 questions which assessed different reading skills was formed and given to the experimental groups as well as to the other 26 students who had passed the proficiency examination at the beginning of the scholastic year in order to see the similarities between the experimental groups, and the differences between the experimental groups and the students who did not have to take Preparatory Class courses. As is seen in the following table (See Figure 3), the results of the first Scheffe Test showed that there were no significant differences between the experimental groups whereas the exempted students had a greater success.

Figure 3. Analysis of Variance to Observe the Differences Between the Experimental Groups and the Exempted Students Before the Proposed Programme Was Implemented

Source	D.F.	Sumof Squ.	Mean	Var
BetweenGrp.	2	4087,96	21,60	Ex.Grp.I
Within Grp.	73	10690,46	21,60	Ex.Gr.II
Total	75	51528,42	70,46	Exempted

Meanwhile, another observation survey for the needs analysis was given to the former Preparatory Class students who were taught ESP courses by means of Technical English Texts in which they did not learn any Mathematical, Chemical or Physical terminology. The results can be stated as follows:

The students who were graduated from the Preparatory Classes of the Engineering and Architecture Faculty were not pleased with the ESP Reading Programme provided for them during the Preparatory Class training. For instance, 87% of the students taking part in this survey complained that in the programme it was not possible for the students to establish the objectives to improve themselves in their profession; the subjects which the students were in need of learning were not considered directly in the development of the programme or in the establishment of the objectives. Moreover, the reading materials were not sufficient enough to satisfy the needs of the students. In the light of these findings it was realised that the ESP Reading Programme of the Preparatory Classes needed designing again according to the realities of the students' needs and the freshman programme of the Faculty by making use of the data provided via different methods of the needs analysis.

The experimental groups started the ESP Reading course in the second semestre, when they started intermediate level of the Basic English course, and when they were ready to manage some specific materials including complex structures and specific vocabulary in the Reading programme. Similarly, Rivers [2] asserts that "Rushing students too soon into reading material beyond their present capacity for fluent comprehension with occasional contextual guessing, which is the ultimate goal, destroys confidence and forces students back to deciphering with a dictionary or word list".

For the Experimental Group I, some materials were prepared on purpose to teach some particular terminology concerning Mathematics, Physics, Chemistry within various general reading activities. And for the Experimental Group II, another type of materials were chosen to teach them specific subjects related to Parts of Machines, Types of Electrical Devices, and so on.

Consequently, the differences between the experimental groups were observed after the application of different types of ESP reading programmes for 16 weeks (in the second half of the scholastic year) besides, the differences between the Experimental Group I, who were provided with both general reading activities and Mathematics, Chemistry and Physics materials, and the students who were graduated from English-medium high schools and exempted at the beginning of the scholastic year. In order to see the differences between these three groups the test with 25 questions, which was given at the beginning of the semestre as the pre-test, was given again as the post test. Finally, the second Scheffe test was administered and the results of this test are illustrated in Figure 4.

Figure 4. Analysis of Variance to Observe the Differences Between the Experimental Groups and the Exempted Students After the Proposed Programme Was Implemented

Source	D.F.	Sumof Squ	Mean	Var
Between Grp.	2	16706,27	70,46	Ex.Grp. I
Within Grp.	73	7810,14	39,52	Ex.Gr. II
Total	75	24516,42	71,68	Exempted

According to the table above it is safe to state that at the end of the academic year:

i) The Experimental Group I, for which the new Reading Programme introduced in this study was used, was much more successful than the Experimental Group II, for which the Technical English Course was implemented, in the ESP Reading Test at the end of the programme.

ii) The subjects in the Experimental Group I were as successful as the students who were exempted at the beginning of the academic year.

5. CONCLUSION AND PROPOSED ESP READING PROGRAMME

Components of the new ESP reading programme proposed in this study can be introduced under some sub-headings such as content, learning and testing situations (Demirel) [9] and it involves two basic stages as; presenting the reading concepts and then developing the students' confidence in recognising and applying them to the Mathematical and Scientific texts. Hence, after the proposed ESP reading programme has been implemented, the students are expected to manage the texts composed of general knowledge items, Mathematical or Scientific concepts, and grammatical and rhetorical signals. And in this experimental research, they did so. In conclusion, it is safe to

claim that in comparison with the previous one, the new ESP reading programme introduced in this study is better for the Preparatory Class students of Gazi University Faculty of Engineering and Architecture to develop their reading skills and to be able to follow the English-medium freshman courses in their departments, which are mainly based on Mathematics, Physics and Chemistry. Consequently, it is suggested that engineering students at English-medium faculties be exposed to practice the general reading skills with mathematical and scientific texts in the reading courses of their preparatory class programme. The following diagram illustrates the general principle of the material used in the proposed ESP reading programme (See Figure 5):

BIBLIOGRAPHY

1. Fredericks, Charles. "How to Develop an ESP Curriculum." **Overseas Education Centre Reference Collection**. Ref. 15A/4: 1, (1996)
2. Waters, Alan. "English for Specific Purposes". Ed. Susan Holden. **Overseas Education Centre Reference Collection**. Ref. 17B/31: 41-42, (1977)

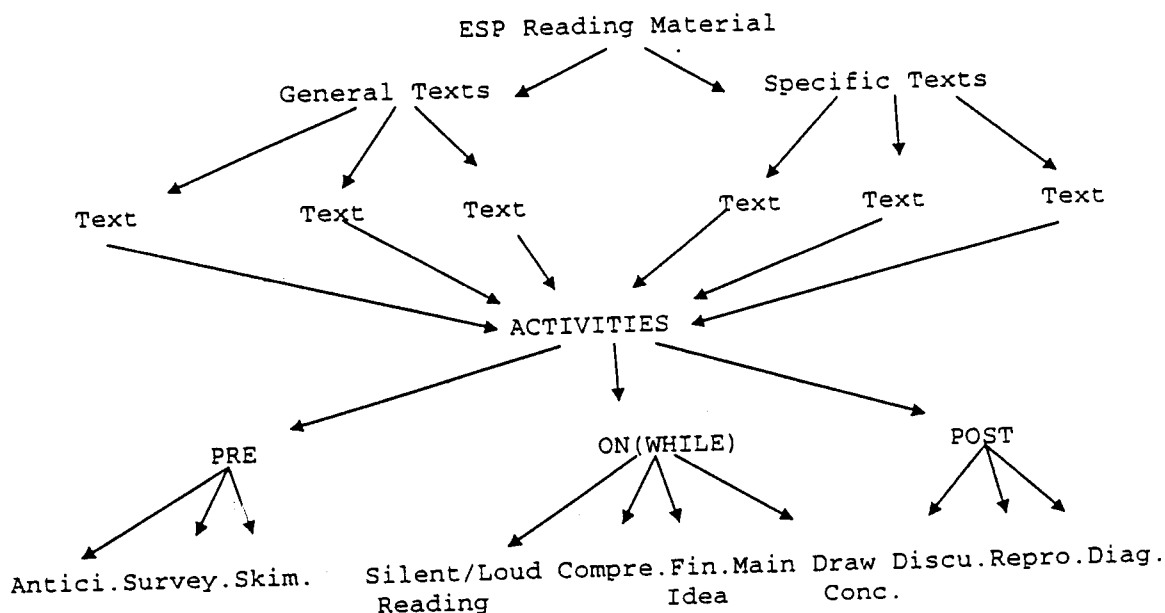


Figure 5: Principle of the New ESP Reading Material

3. Tinkham, Thomas. "Analysis of Reading Tasks in an ESP Situation." **LSU ESP Collection**. Ref. 94/21: 134-136, (1981)
4. Bensoussan, M; J. Golen. "An Advanced English Course for Students of Mathematics." in **Reading for Professional Purposes**. Ed. J. M. Ulijn and A.K. Pugh. Acco: Amersfoort 185-87(1985)
5. Moorehouse, C. "Linked Skills Courses" in **Team Teaching in ESP- 106**: 70-71 (1980)
6. Demirel, Özcan. "**ELT Methodology**". Ankara USEM pp. 75-83 (1992).
7. Rivers, Wilga. "**Teaching Foreign Language Skills**". Chicago UCP (1981)
8. Jones, Keith; Peter Roe. "Designing English for Science and Technology (EST) Programmes in Academic Settings for Overseas Students: Problems and Perspectives". In **international Education Centre Reference Collection**. ETIC No: 15 C/26:17, (1975)
9. Demirel, Özcan, "Approaches to the ELT Curriculum Design" in **Language Journal** No:56: 61-69, (1997)
10. Williams, Ray; John Swales, (Ed) "**Common Ground Shared Interests in ESP and Communication Studies**". Oxford Pergamon (1984)
11. Peterson, Pat Wilcox.. "**ESP in Practice**". Ed. Washington D.C. U.S.I.A. (1989)