ABSTRACT

EST, a sub-field of ESP, has now grown independently into a fast-moving discipline. Its origin is attributed to the unprecedented increase in scientific and technical endeavour. The remarkable explosion of knowledge in Medical and Physical Sciences and many other scientific and technical developments have necessitated the acquisition of greater proficiency in English because the aforesaid scientific and technological achievements are more accessible in English than in any other language. Therefore English has emerged as a potent means for the students of science to pursue higher education and communicate their findings worldwide.

In addition, English also plays an eminent role in the professional careers of doctors and engineers because it substantiates their professional performance and hence enables them to catch up with the time. EST is thus, linked with the changing social, academic and professional needs of the learners and hence it has given rise to the purpose oriented forms of language, which depend largely on a specialist subject matter. In other words, EST has emerged to cater to the immediate and specific needs of the students.

The present study seeks to explore two aspects of EST, the theoretical and the empirical. Linked with the theoretical aspect of EST is the study of its theoretical framework. Hence
the major issues pertinent to the theoretical framework of EST have been examined in the first three chapters.

The first chapter deals with origins, divisions and distinct features of scientific English. An appraisal of EST, its major trends and current approaches have also been put forth.

The second chapter encompasses the detailed discussion on the basic concept of scientific discourse, scope of discourse analysis, nature of EST paragraph and rhetorical techniques. The views of Barber, Widdowson and Trimble have been cited in order to delineate the aforesaid theoretical frameworks of EST.

The third chapter is primarily concerned with the rhetorical functions which are commonly used in EST discourse to organise scientific and technical information. These rhetorical functions represent different writing styles and multiple organizational frameworks that are recurrent in scientific texts.

The rhetorical functions and their sub-functions as discussed by Selinker, Lackstrom and Trimble have also been incorporated in this chapter. Thus, the first three chapters contain an elaborate discussion on the structural and discoursal aspects of EST which encompass syntactical, semantic, grammatical and lexical aspects of scientific English.
The second aspect of EST which is based on empirical study has been discussed in chapter IV. It illustrates how scientific English is used in scientific journals and what distinct format the entire scientific community follows in writing scientific research articles. Therefore, 8 scientific research articles written by non-native users of English have been drawn from Natural and Medical Sciences. These articles have been analysed to substantiate the empirical findings.

Though there is little need to reiterate the whole findings in abstract, it will be the right moment to recapitulate, in brief, the findings and some essential features that characterise scientific English used in scientific research articles written by non-native users of English.

It has been found that the format of scientific research articles by non-native users of English is based on such distinct constituents which incorporate Introduction, Method, Result and Discussion sections. The format, also called, IMRD sections is, in fact, followed by the entire scientific community.

The statistical analysis indicates that the scientists, in order to remain, objective and impersonal, choose passive forms in their scientific research articles because the important idea is not who did something but what was done and what methods and procedures were adopted for the research. In addition, the scientists shun Active Voice because they feel
that it will be too strong and hence it will not fit their professional needs. Therefore, the overall ratio of active voice used in IMRD sections of 8 scientific research articles is only 140 (35.3) where as the overall ratio of Passive Voice is 256 (64.6%) of the total number of 396 running verbs.

Hedging, the expression of tentativeness has been found to be an important feature of Scientific English. The scientists tend to use hedging device where exact reference or precise numerical is unobtainable or unnecessary in view of the needs of audience.

It has also been found that novice-non native users of English are incapable of writing English with ease because they have neither rich vocabulary nor they can innately acquire grammatical accuracy. Owing to this, numerous mistakes and pitfalls have been found in scientific research articles written by non-native users of English. They are as follows:

1. Faulty parallelism
2. Mistakes in making proper agreement between subject and predicate
3. Overuse of noun clusters
5. Mistakes in the use of active verbs with inanimate subjects.
6. Excessive use of abbreviations and footnotes.

With a view to overcoming the aforesaid language inaccuracy some innovative remedial measures have also been suggested to the learners. In addition, pedagogical strategies have also been offered in order to enhance the overall language competence of the students.

The major concern of chapter V is with the discussion of the development and expansion of scientific vocabulary. I have also analysed the lexical elements by classifying the different types of technical terms on the basis of their opposition to their vernacular meanings. Therefore, words have been classified into general, specialized and sub-technical categories against the perspective of the teaching of scientific vocabulary.

With regard to the teaching materials it has been recommended in chapter VI that besides literature oriented lessons, technothriller should also be introduced in the language class to instill motivation in the students of science. As a matter of fact, the students of science take least interest in literature oriented materials because they feel that the fictitious stories and plays are irrelevant and do not cater to their scientific and social needs. So the inclusion of technothriller based on scientific facts and findings, in academic curriculum will prove to be much rewarding.

One of the major obstacles in acquiring communicative competence is the learners' poor vocabulary. The students of science who are less exposed to English language have poor vocabulary so they manifest their inability to decipher the
writer's intended meaning in the given text. Besides, they cannot speak and write with ease.

There is no doubt that the knowledge of substantial vocabulary assists the learner's proficiency in all the integrated skills but vocabulary teaching has never been undertaken as a part of curriculum. Therefore different strategies have been suggested in this chapter in order to develop extensive vocabulary of EST students. They are as follows:

I. The learners should be given practice to guess the meaning from the context.

II. The teacher should teach students the word formation process and derivational morphology.

III. Teaching of vocabulary through collocation, hyponymy, word network, synonyms and antonyms.

IV. The students should also be given practice to form several two-word and several three-word compounds.

An essential part of the teaching of any language is the teaching of its grammar. It includes a total mechanism that a language possesses or which determines the rules that the learners use while speaking or writing a language. Hence the knowledge of grammar is indispensable for obtaining deeper level competence in language.

Keeping this in view it has been suggested that the teacher should evolve his own innovative methods based on generative grammar in order to develop language competence at higher level so that the learners can produce infinite number of correct sentences.
The teacher can also select passages from the text in order to analyse and illustrate certain grammatical principles.

Editing is also an important means for improving grammatical accuracy. The students should be given to write a paragraph on the spot. The grammatical mistakes that they commit should be rectified on the black board.

To sum up, the pedagogical suggestions that have been given in chapter vi with regard to the development of vocabulary, course materials, and grammatical accuracy, are indispensable for promoting the communicative competence of the students of science. It has been suggested that the skill of writing, vocabulary of learners will increase substantially if they are taught and monitored tactfully in the class itself. The use of technothriller as the course materials will substantiate the motivation of the learners. Meticulous insights into grammar may also be instilled if the students are motivated to examine grammatical devices very carefully in the given text. Hence a considerable degree of competence in English will be obtained if the remedial measures offered in chapter vi are carefully applied in the class.