

Specific Stylistic Features of English for Electrical Engineering

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ABSTRACT: *It is necessary for graduates and postgraduates of electrical engineering to master their English for professional purposes under the present conditions of integrating Europe. The good knowledge of their professional language improves their qualification and consequently their good positions at the international labour market providing them with adequate social status.*

According to the author's research in English for Electrical Engineering this specific professional language displays special features, namely in the linguistic category of style. It manifests features that are general for every scientific style but also those which cannot be found in any other language of any other scientific discipline. One of the general features of the style of science and technology is their format whose function differs according to the formality degree of texts and their purpose (modality). The lexical cohesion of electrotechnical texts displays some general qualities but its individual lexical cohesive items are represented mostly by branch-specific terms. The categorization of terms used in scientific electrotechnical texts is a specific topic of the author's investigations in the language of electrical engineering. Three types of terms used are distinguished: general scientific terms, general electrotechnical terms and branch-specific electrotechnical terms. While general scientific terms originate in their majority in Latin, branch-specific terms are usually coined on the general English basis. Some of them have been integrated into general English usage (e.g. mobile, chip, software), but the usage of others is restricted by profound professional knowledge of e.g. microelectronics, biomedical engineering etc. (e.g. cache, baroreflex, rail-to-rail output stages).

The perception of electrotechnical texts and its rules is another focus point of the author who, as a teacher of English for specific purposes, is especially interested in the regularities of the process of perception of such texts and in the development of a teaching method facilitating the learning process for students of electrical engineering who have special needs in acquiring their English for specific professional purposes.

1 INTRODUCTION

The graduates and postgraduates of Brno University of Technology have had numerous opportunities to study and work abroad and such opportunities will even be widened in future. We have already been preparing our students for cooperation based on the English language usage at the Department of Languages. Teaching English for professional purposes has a long tradition at our department and started nearly three decades ago.

Originally teaching English for students of electrical engineering was reduced to introducing specific vocabulary, mainly such lexical items which denoted only general electrotechnical expressions as e.g. *semiconductor, electric current, wire, capacitor,*

frequency, transistor, etc. Our original textbook dated from 1980s was designed to cover the beginner level up to the intermediate one. However, learning beginners on the basis of English for specific purposes has not proved to be effective. The motivation of students was low as the subject of electrical engineering was too limited to offer enough topics and themes for successful foreign language learning and all-skills training. This was the reason why later, during the last twelve years, we have changed the methodology of ELT and dropped learning English for Specific Purposes to beginners. They are taught English on the general basis and ESP is introduced only on the pre-intermediate level. We still base teaching ESP on what we call *general* electrotechnical vocabulary and topics. It is because our classes consist of students of English who study various specific study programmes of electrical engineering offered by the Faculty which are the following ones:

- Bachelor's Programmes:
- 1) Electrical Electronic
 - 2) Control and Communication Technology :
 - a) Automation and Measurement Techniques
 - b) Electronics and Communications
 - c) Microelectronics and Technology
 - d) Power Electrical and Electronic Engineering
 - e) Teleinformatics

- Master's Programmes:
- 1) Cybernetics
 - 2) Control and Measurements
 - 3) Microelectronics
 - 4) Electrical Manufacturing and Management
 - 5) Biomedical and Ecological Engineering
 - 6) Power Electrical and Electronic Engineering
 - 7) Power Electrical Engineering
 - 8) Communications and Informatics
 - 9) Electronics and Wireless Communications

Besides teaching about 1300 students yearly at this Faculty, we also teach nearly 600 students of the Faculty of Information Technology which falls under the Brno University of Technology as well. Specification of individual branches is profound and therefore general electrotechnical texts and vocabulary seems to be the convenient compromise for teaching English for Specific Purposes to all the students.

The question is what can be defined as general electrotechnical vocabulary and is it the only component of English for specific, in our case electrical engineering purposes ? I would like to start from the latter question:

The analysis of texts on electrical engineering excerpted from original scientific books of various electrical branches indicates several typical features of this specific professional language. The paralinguistic feature is the *format* of the texts and their specific linguistic features are represented by their *stylistic varieties* including *lexical cohesion*, the *density of technical vocabulary* and consequently the *target groups of recipients*. Only this surface account of the specific features gives an answer to the above former question and i. e. the vocabulary is only one of several components which characterize the stylistic variety of English for electrical engineering.

2 FORMAT

The most evident feature is the *format* of electrotechnical texts which is according to my investigations rather formal and traditional. It is usually represented by small fonts, long paragraphs and endless sentences which is a typical bad habit of any technical text. The monotonous visual representation of texts published in books is partly made more attractive by particular patterns, figures, tables and charts. The visual components of electrotechnical texts published in scientific journals and conference proceedings have capitalized headlines and subtitles that briefly explain the theme. Technical reports present formulas, figures of models and tables of parameters. Acronyms printed in capitals attract the recipient's attention in all the types of electrotechnical texts. Altogether, the privileged qualities of the format of electrotechnical texts prove to be:

- 1) well-arranged formal system that indicates the logical succession of information
- 2) embolded letters
- 3) distinguished paragraphs with bold initials
- 4) figures that indicate lines
- 5) subtitles, either verbal or expressed only by figures
- 6) different colour of paper used

Scientific books, articles in scientific journals, conference proceeding and traditional forms of technical reports do not take full advantage of possibilities offered to format by computers. Their full use and individual approach is more evident in *oral* presentations of electrotechnical texts while printed texts remain more traditional. The traditional format seems to correlate with the degree of formality represented in highly scientific technical texts. The higher degree of formality expressed in the stylistic variety, the more traditional and conventional devices are used in its format.

Nowadays the format can benefit from the wide range of possibilities offered by computer. Crystal means that computers (he namely analyses the language varieties presented on the Internet) give authors rights to use their own and original shape of format, which could previously been changed by publishers or senior editors and thus a part of special meaning could have been lost (2001).

3 STYLISTIC VARIETY

The typical linguistic features manifested by electrotechnical texts are their appropriate stylistic variety characterized by its degree of formality, its modality, the adequate density and composition of electrotechnical vocabulary, the lexical cohesion of the text and its coherence. The degree of all the above mentioned features correlates with the *target groups of recipients* and their level of specific knowledge of their branch of electrical engineering and also of their level of English competence.

Such a rag-bag of characteristic features creates a specific province of English for electrical engineering purposes. My analysis of electrotechnical texts excerpted from the *New Scientist* journal, textbooks on English for students of engineering, original scientific books, technical reports, articles in scientific journals and conference proceedings manifest the following conclusions:

The convenient stylistic variety of the above-mentioned texts is the *style of science and technology* and its subcategory of *popular scientific style* in the case of the *New Scientist* articles. This stylistic variety is characterized especially by logical succession of description,

since bad arrangement can cause serious misunderstanding and even damage. The producer when writing should always bear in mind his receiver with his presupposed knowledge of the subject discussed and schemata created in his mind by previous level of experience. This concerns especially the specificity of terms used which should correlate with the receiver's specific knowledge of the branch concerned. The degree of knowledge in individual electrotechnical disciplines correlates with the usage of electrotechnical terms which can be either generally known to all who study any branch of electrical engineering; or the terms can be so specific that only experts in respective individual disciplines are acquainted with them.

The style of science and technology in electrotechnical texts displays a scale of *formality* which can be assessed as formal, informal and even colloquial in the case of the subcategory of the popular scientific style. These are the degrees of formality found in the text types submitted to my analysis, however, other examples of various formality degree can be given e.g.: a warranty certificate of an electrotechnical device can display a highly official language, on the contrary a conversational dialogue on a specific electrotechnical subject produced by engineers or technicians can be informal or even a sort of a professional slang will be used. Formality and its range can vary in the style typical of English for electrical engineering.

This province also manifests a range of *modality*, since it is required for the purposes of the respective texts. They can meet objectives necessary for the form of a technical report, conference contribution, a scientific article published in a scientific journal, a long and detailed explanation in the form of a scientific book, written academic lectures printed in a textbook to name at least the range of modality represented in my investigations.

4 DENSITY AND COHESION

The analysed electrotechnical texts contain approximately 30% of specific terms which represents high *density of specific vocabulary*, the lexical items of which display low-probability occurrence in other text types, not oriented to electrical engineering. This specific type of vocabulary is mostly found in lexical cohesive chains which convey the gist of the message. Such *cohesive* lexical links play an important role in style, since their qualified usage facilitates comprehension of the message. Thus the cohesive force in electrotechnical texts is reached not only by the high occurrence of specific lexical items but also by their bonds within the lexical chains conveying the gist. These cohesive lexical chains as an intelligible net of mostly province-specific terms, serve as orientation points for recipients in their gradual processing of the delivered information. The fact that English is the leading language in electrical engineering and therefore even some English words are used in Czech as loanwords for electrotechnical terms, enables even the Czech students whose English competence is comparatively low, to follow the lexical cohesive chain and thus to comprehend the information delivered in English. Their prerequisite factual knowledge of the subject and personal experience have created schemata in their minds which work both in Czech and in English.

5 CLASSIFICATION OF TERMS

The terms comprised in lexical chains are either **general electrotechnical** expressions such as e.g. *automatic data processing systems, computing machines, electrical valves, display, semiconductor, computer program, databases* etc., or **branch-specific electrotechnical** terms as e.g. *neural network, Timation satellite, digitizer, baroreflex, cache, rail-to-rail output stages* etc. The third group of terms found in electrotechnical texts can be found in any scientific texts as they are **general scientific** terms e.g. *features, applications, operated, adaptable, experiments* etc. The last group of terms frequently originates in Latin

while many of electrotechnical terms come from the general English usage and they have acquired a new pragmatic meaning within the specific electrotechnical context. The typical examples are the terms of microelectronics: *bulk-driven* transistors, *rail-to-rail* circuits, *crosstalk noise*, *tight-binding* method, *thin-film* dielectrics etc. The expressions printed in italics originate in general English and their new usage in electrical engineering is based on transfer of a referent which is new but resembling the original one in a way.

6 PERCEPTION OF PROFESSIONAL LANGUAGE

The choice of appropriate terms is crucially connected with the level of **specific professional knowledge** and the **English language competence** of the recipient which should be adequate to the specificity of the text produced. The producer thus should bear in mind the recipient's characteristics. He or she may be just laymen interested in science discoveries, instructed laymen who have already acquired some general scientific knowledge or he/she can be a student of electrical engineering or even he/she can be an expert in some branch of electrical engineering. The other aspect which should the producer bear in mind is the receiver's level of English as a foreign language.

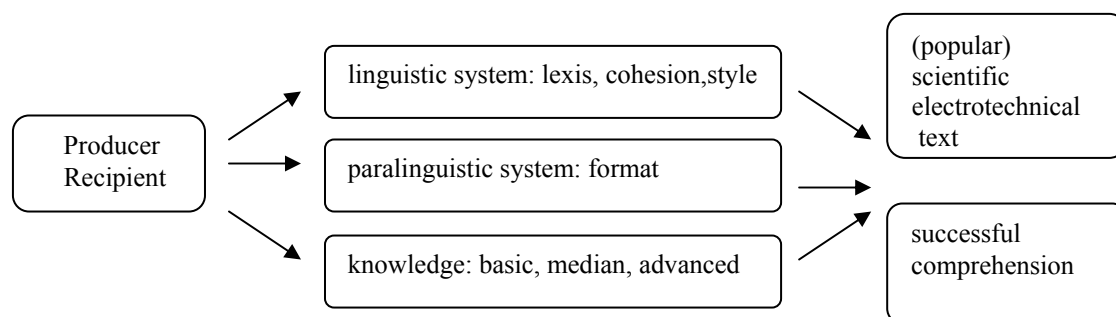


Figure 1: THE LANGUAGE OF ELECTRICAL ENGINEERING –USERS, TOOLS, GOALS

7 IMPLEMENTATION OF RESEARCH RESULTS

The results coming of my investigations are used in teaching English for electrical engineering at the Faculty of Electrical Engineering and Communication and also at the Faculty of Information Technology, Brno University of Technology. The teaching process based on these investigations will, hopefully, be more motivating and effective. The precise rules and definitions of their professional language facilitate the students of engineering the learning process as rules and definitions are regular topics in electrical engineering subjects and they comply with their usual way of perception and learning.

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