

# An Instruction Tool for Effective Technical/Scientific Writing in English

Dagmar MALÍKOVÁ

Brno University of Technology, Faculty of Electrical Engineering and Communication, Údolní 53, 602 00 Brno, Czech Republic, malikova@feec.vutbr.cz

**KEYWORDS:** *reference areas, types of technical/scientific writing, style, language functions, vocabulary*

**ABSTRACT:** *Professional writers in the fields of science and technology who use English as the second language need to write in English effectively in order to become more competitive and flexible in the labour market. Addressed to professional writers who have to be able to share information in the clearest possible way and choose the style, language functions and vocabulary appropriate to the purpose and audience is the project Writing Professional English. The project provides them with guidance and support in their needs to write more effectively in English. Participating in the project are professionals from Austria, Czech Republic, France, Iceland, Italy, Slovakia and United Kingdom.*

*The final product has been designed in the form of 11 self-study training modules, from which any end-user, or a national group of end-users, can select what is appropriate for them:*

*Reference modules offer short explanatory notes on problem areas followed by authentic examples related to pharmacy, materials engineering, electrical engineering, informatics, chemistry, chemistry-related disciplines and medical engineering. The following problem areas of technical/scientific writing have been identified: types of technical/scientific writing – scientific articles, research papers, technical reports, reviews, proposals, product description, patent application, composition of a piece of writing, style, language functions, grammar, and vocabulary. Each national version is provided with a glossary of the most frequent and difficult words in English and a national language.*

*Instructional modules contain task-based exercises consolidating the referential information given in reference modules and optional exercises targeted at relevant national groups with the aim to highlight specific problems stemming from different mother tongues. The materials can be used as a self-study resource. Teachers are provided with materials for taught courses.*

*A methodological module provides guidelines on how to extend/modify the material offered. All the materials will be available in a handbook format, on CD ROM and on-line.*

## 1 INTRODUCTION

Informative research of markets conducted in the participating countries has revealed a lack of comprehensive material for professional writing. Commercial publications and course books dealing with writing problems in English concentrate on academic writing in general, without paying a special attention to practical problems of writers in the workplace or to specific linguistic problems stemming from mother tongue languages of the end-users. Also the previous Leonardo da Vinci project entitled **Writing in English: A Practical Guide for Technical and Scientific Writers**, though very well received, concentrated on shared writing difficulties of non-English end-users only. It contains chapters on types of writing, e.g. scientific/technical papers, components of a technical paper, e.g. title, abstract, introduction, stylistic features, e.g. clarity, objectivity, and use of language. It only provides users with reference material in a handbook format. However, it is a solid base on which to build. The new project **Writing Professional English**, which can be considered as a continuation of the previous project **Writing in English** may fill the gap. It addresses professional writers in the fields of science and technology, professionals with linguistic skills in the area of ESP and multimedia experts from educational institutions in EU, EEA and pre-accession countries.

## 2 OBJECTIVES AND METHODS

Assessment of raw materials (authentic pieces of writing from target professionals), needs analysis and evaluation of the previous project helped to identify additional needs and on them based objectives to be dealt with in the present project:

1. To cater for the opinions of the end-users as to how the materials should be adapted for their own national needs. Resulting modifications include additions and deletions to various sections in the handbook already produced, plus adding of national glossaries.

2. To suggest modifications for professional sub-groups, specifically in the new areas that the project is focusing on, i.e. informatics, physical and materials engineering, medical engineering. A particular attention was paid to the ways in which these target end-users' needs were similar to or different from those identified within the previous project.

3. To develop instructional versions with self-study, task - based exercises equipped with keys for self-assessment.

4. To provide material developers with methodological guidelines on how to construct their own materials on the basis of the models offered by the project team.

5. To produce all materials in IT versions (CD-ROM and on-line).

At the beginning of the project development, the specific needs of the end-users from different countries and different professional areas were evaluated and a further diversification of tasks was outlined.

The methods used in the development of **reference and instructional modules** are as follows:

1. Testing of the developed draft products with potential end-users through testing questionnaires and training sessions

2. Evaluation of the testing stages in order to get a quality feedback on the methods used and materials developed

3. Making corrections and draft materials

In the **Methodological Module**, the methods will be described in a detailed manner of

- conducting an effective needs analysis among the target groups
- processing and evaluating needs analysis questionnaires
- collecting and collating raw materials (authentic pieces of writing)
- designing draft materials
- testing them among the target groups
- processing and evaluating testing questionnaires
- selecting and re-drafting final materials

### 3 RESULTS

The final product consists of reference modules, instructional modules and a methodological module.

**Reference modules** cover authentic examples of texts related to:

- Specific areas of science and technology, such as chemistry, pharmacy, physical/materials engineering, electrical engineering, informatics, construction engineering, process engineering, and medical engineering. Whereas the previous product focused on the writing of scientific/technical articles, research papers, proposals and technical reports, the continuation project also deals with reviews/ assessment of other authors' pieces of writing, promotional materials and leaflets, newsletters, and papers for discussions and negotiations.
- National versions make the materials more directly relevant to writers in particular countries through glossaries of English terminology in Czech, Slovene, Icelandic, and Italian, highlighting the words and phrases difficult from the viewpoint of the end-user from a particular country.

Content	AREA Option of examples	National versions				
		English	Czech	Slovene	Italian	Icelandic
Types of professional writing Structural components Stylistic features Language functions Grammar Vocabulary	Electrical engineering	X	X	X	X	X
	Informatics					
	Pharmacy					
	Physical and Materials engineering					
	Construction engineering					
	Process engineering					
	Medical engineering					
	Chemistry					
Glossaries in Czech		X				
Glossaries in Slovene			X			
Glossaries in Italian				X		
Glossaries in Icelandic					X	

**Instructional modules** will contain:

- **Task - based exercises** consolidating the referential information given in reference modules.
- **Optional exercises** targeted at relevant **national groups** (Czech, Slovene, Icelandic, and Italian) with the aim to highlight specific writing problems stemming from different mother tongues. This would enable professionals to use the materials as a self-study resource while teachers will be provided with materials for taught courses.

Content	Area	National versions					
		English	Czech	Slovene	Italian	Icelandic	
Core exercises	Engineering Chemistry	X	X	X	X	X	
Optional exercises for Czechs			X				
Optional exercises for Slovenes				X			
Optional exercises for Italians					X		
Optional exercises for Iceland						X	
Key to exercises			X	X	X	X	X
Self – assessment section			X	X	X	X	X

**A methodological module** for material developers provides guidelines on how to extend/modify the material offered.

The project also involves production of all developed materials in **IT versions – CD-ROM and on-line** – in addition to the original handbook format. An open on-line version will provide an appropriate model material for further adaptations tailored to the needs of the target audiences from different countries and professional areas.

#### 4 DISCUSSION

An innovative aspect of the proposed project can be seen in the methodology applied through all the phases of the material development, testing and evaluating. A diverse partnership, both in terms of

transnationality and in terms of subjects involved (technical vocational schools, universities and colleges, industrial enterprises, research institutes, and chamber of commerce and industry) facilitates cooperation between material developers and target groups (needs analysis, testing draft products, evaluating, and dissemination). Thus, from the very beginning, there is a feedback on what has been produced so far. The interaction between linguists from educational institutions and technicians/scientists from industry gathered in one team proved to be highly effective. The result is a flexible product where the end-users can choose a material suited to their linguistic and professional needs, can select between a handbook and an IT version and can decide whether to use a reference material only or to complete task-based exercises to consolidate their knowledge.

The instructional modules include keys or model texts in answer to the tasks, which often cannot be found in commercially produced books on writing skills.

Web sites can be tailored to the needs of professional writers in different countries and different working sectors that may, on the other hand, be found in any European country. E-learning materials bring about a radical change in the approach to self-study as they solve a number of practical problems (quick and immediate access in the process of writing), this goes beyond the restrictions of a classroom or a library. Recently, a combination of English and mother tongues of the target audiences enhances the exploitability of the products for the end-users who experience difficulties with linguistic terminology in English. A focus on the terminology of specific areas of science and technology also encourages the interest of relevant end-users.

Open modules can be further developed under national programmes to be used effectively both for self-study and as a basis for taught courses.

The project focuses on the improvement of professional writing skills in English as one of the leading tools of communication. The project's value for national vocational training policies and practices can be seen in providing a powerful tool in the form of modular packages for professional writers in English, including reference, training and self-study elements. The open format of the outcoming material will facilitate transfer to other working environments. An innovative aspect of the product can be seen in its versatile approach to the practical needs of professionals in the workplace.

## **5 CONCLUSIONS**

The expected impact of the project's outcome is to enhance professional writing skills of the end-users in industrial enterprises, research and educational institutions from engineering fields, chemistry, and pharmacy. These newly acquired competences will give the professionals a greater confidence in performing their working tasks in the internationally competitive working environment. Being able to write more effectively in English will help technicians, engineers managers, etc, to apply professional knowledge to European working environments where the writing skills in English are required.

In the long-term perspective, a group of material developers is expected to base their future research and working activities on the results of the project. The development of writing skills is a lifelong process and the production of appropriate training materials – based on E-learning and tailored to the needs of individual groups of professional writers - is a lifelong task for material developers. An open, flexible structure of reference/instructional modules as well as the guidelines offered in the methodological module will enable material developers to cater for specific needs of individual groups of professionals in different countries and different areas of science and technology. Common experience gathered by the transnational partnership can be further developed under national programmes where the final products can be updated/modified/extended after the completion of the project.

## **ACKNOWLEDGEMENTS**

This project and its outcomes have been co-financed by the European Commission from the programme Leonardo da Vinci.

## **REFERENCES**

- Writing in English, a Leonardo da Vinci Project, 2000  
McConnell Duff, A., 2000. Into English. DZS,d.d. Zaloznistvo literature, Ljubljana  
Quirk, R., Greenbaum, S., Leech, G., Svartvik, J., 1985. A Comprehensive Grammar of the English Language, Longman