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A PRACTICAL HANDBOOK FOR WRITERS IN MATERIALS ENGINEERING

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1 Introduction

The proposed project, entitled **Writing Professional English**, is a language project further developing the results of the previous project entitled *Writing in English – A Practical Guide for Technical and Scientific Writers*. The four partners (CZ, UK, D and SK) put together a manual of about 75 pages for the benefit of technical/scientific writers. This work, however, was limited, since it only provided users with a handbook or reference approach to their writing problems, and it mainly concentrated on shared writing difficulties of non-English end - users. The aim of the continuation project therefore is to add value to what has been achieved so far. The project **Writing Professional English** addresses professional writers in the fields of science and engineering and provides them with guidance and support in their needs to write more effectively in English. In engineering education, the development of writing skills is often completely neglected or reduced to lower-level writing that does not reflect the needs of up-to-date science and technology. The acquisition and mastering of advanced writing skills in English is of particular importance for the end-users from newly accessed countries of Central and Eastern Europe; it is a necessity for any engineer who wishes to succeed at the common European labour market. The project **Writing Professional English** offers **11 self-study training modules (reference handbooks and exercises) for professional writers in English**, from which any end-user, or national group of end-users, can select what is appropriate for them and enhance the level of their writing skills. The project group consists of professionals with linguistic skills in the area of ESP and multimedia experts from educational institutions and translation agencies sited in EU/EEA (UK, Italy, and Iceland) and newly accessed countries (Czech Republic and Slovenia). In the course of the project development, a team of material developers approaches the end-users (testing partners) from colleges, universities, research institutes, and industrial enterprises from the above countries and also from Austria, France, and Slovakia with the aim to validate the outcome of the project.

2 Objective and methods

One of the reference handbooks is specifically designed for **materials engineers** through authentic examples and extracts of texts from materials engineering area. The main objective of this special version for materials engineers is to make the general descriptions of writing problems more directly relevant to the writers from particular professional areas. This approach seems to be very convenient for the end-users because authentic examples and texts related to the field of materials engineering offer the terminology that materials engineers can easily understand.

Example:

2.1 Titles

The purpose of a piece of scientific writing is to present information clearly and concisely so that it can be easily understood. Clarity therefore begins with the title.

Elements in a title

In technical and scientific writing the title is a precise description of the contents. It should include specific words to indicate the following:

- **the topic**, that is, the main, general subject you are writing about
- **the focus**, that is, a detailed narrowing down of the topic into the particular, limited area of your research
- optionally, for a scientific article, **the purpose** of your writing. This means including a word such as the following, which tells the reader what kind of argumentation to expect:

An Analysis of ...	An Assessment of ...	A Comparison of ...	A Description of ...
A Determination of ...	A Discussion of ...	An Evaluation of ...	An Explanation of ...
An Outline of ...	An Investigation into...		

Some sample titles:

Purpose	Topic	Focus
An Analysis of	<i>Grain Boundary Networks and Their Evolution</i>	<i>During Grain Boundary Engineering.</i>
An Examination of	<i>the Flow Process</i>	<i>in Superplastic Yttria-Stabilised Tetragonal Zirconia.</i>
A Comparison of	<i>Methods to Determine the Fracture Toughness of Three Glass-Ceramics</i>	<i>at Elevated Temperatures.</i>
An Investigation into	<i>the Cause of Inhomogeneous Distribution of Aluminium Nitrides</i>	<i>in Silicon Steels.</i>

From the above example, it can be seen that the second and third columns of the lower table contain the terminology of materials engineering while the expressions in the first column are more general and can apply to any engineering/science area.

On the basis of thorough investigations and deep insight into the writing difficulties of professionals, a great deal of information has been collected through an assessment of raw materials (authentic pieces of writing from materials engineering professionals), needs analysis, and mainly from the testing/piloting stages of the project. The review process for the Reference Handbook (Materials Engineering) was intended to establish:

1. whether the special versions meet the needs of the expected end-users
2. whether any further revisions of the material might be necessary

The piloting was conducted by means of specially prepared questionnaires. Draft materials developed by material developers from the language department of the Faculty of Mechanical Engineering (Brno University of Technology) were tested not only by the students and researchers from the faculty and the Institute of Physics of Materials, Academy of Sciences of the Czech Republic but also by the project testing partners from Austria (Leoben University), France (Chamber of Commerce and Industry in Jura), and Slovakia (Matador Puchov).

The respondents' reasons for reviewing the materials represented a wide range of experience and opinion, some considering the handbook as actual or potential end-users, others from a more professional or pedagogic viewpoint. The most commonly reason given was the likelihood of the respondent having to write papers in the future. Respondents were also asked to provide comments on each of the sections in the reference handbook. They gave each section a 'grade', using the 5 to 1 scale:

*5 = extremely useful 4 = very useful 3 = quite useful 2 = not very useful
1 = not at all useful*

The final version of the reference handbook for materials engineering – after redrafting based on the results of piloting – is available in the form of a CD-ROM / website (as a part of project materials).

3 Results

The above mentioned reference handbook for materials engineering contains six chapters where specific writing problems are described in the manner that should be convenient for science and technology non-native writers in English. The handbook cannot, of course, cover the whole range of specific problems of individual writers but it strives to provide a quick and flexible access to the reference material that can offer immediate solutions - in the process of writing - to the most common writing problems.

The first chapter **Types of Writing** represents an introduction to science/technology writing in general as it describes the individual types of writing – scientific articles, research papers, technical reports, reviews, proposals, product description, and patent application. The following five chapters offer short explanatory notes on previously identified problem areas followed by authentic examples related to materials engineering. The second chapter **Composition** is devoted to the structure of a piece of writing and contains the following sections: Titles, Planning your Writing, Paragraph Writing, Introductions, Writing the Main Body, Conclusions, Referencing, Plagiarism, Abstracts, Summary Writing, Acknowledgements, and Appendices. The third chapter provides information on **Style** of a piece of writing (Objectivity, Clarity, Formality, Hedging, and Signposting). Chapter four deals with **Language functions** (Agreeing and Disagreeing, Classifying, Comparing and Contrasting, Defining, Describing a Process, Emphasising, Generalising, Paraphrasing, and Quoting). Chapter five **Grammar** is devoted to selected grammatical difficulties that

frequently occur in science/technology writing (Writing Numbers, Articles, Using Nouns, Verb Tenses, Using the Passive, Word Order, and Punctuation). The last chapter **Words** contains sections on Abbreviations, Words of Latin and Greek Origin, Prefixes and Suffixes, and Confusing Words.

The handbook is also provided with **glossaries** of English terminology in Czech, and Slovene, highlighting the words and phrases difficult from the viewpoint of the end-user from a particular country. Though the expressions contained in the glossaries are of more general nature, not directly related to materials engineering, they often cause difficulties to science/technology writers. The glossaries of some operative expressions and synonyms used in science/technology texts have been compiled and organised as an aid to all who need English in writing their research & technical reports, and who may wish to think of alternatives that do not always appear in the dictionary.

Example:

nedostatečný	poor, insufficient, weak, imperfect, unsatisfactory
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4 Discussion

Informative research of national markets conducted in the countries of the project partnership has revealed a lack of comprehensive material on 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 of the nationals from the targeted professional fields.

An innovative aspect of the handbook for materials engineering 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 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.

Another innovative aspect of the product can be seen in its versatile approach to the practical needs of professionals in the workplace. On-line versions will create a basis for further adaptations of the materials to meet the changing needs of the professional writers in the course of the lifelong acquisition of the skills required. A web site can be tailored to the needs of professional writers through adding new problem areas and extending glossaries of operative expressions and synonyms used in science/technology texts.

An open material can be further developed to be used effectively both for self-study and as a basis for taught courses.

5 Conclusions

The presented practical reference handbook for materials engineering is an integral part of the project entitled **Writing Professional English** that will contain self-study training modules (reference handbooks and exercises) for professional writers in English. 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. A competence-based and self-study oriented approach is user-friendly and therefore attractive for professionals who seek a quick access to the problems they face in their everyday routine at the workplace.

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