Constructing a Foreign Language Standard for Technically-Oriented Universities

Ludmila Neuwirthova
Faculty of Electrical Engineering and Communication, Department of Languages,
Brno University of Technology, Czech Republic
neuwirta@feec.vutbr.cz

Abstract **- The paper reports on a research process of constructing a flexible standard for world languages based on the application of European criteria and requirements, as formulated in a *Common European Framework of Reference for Languages,* to language for academic and technical purposes. The international compatibility of the standard can be seen in using reference levels of language proficiency B1 and B2 on the *European Framework* scale, and in coherency of the European criteria for language education and all the components of the standard: learning/teaching objectives, expected outcomes, communicative language competence, and a Bank of word descriptors for students' self-assessment. At the same time a needs analysis was conducted to select and prioritise specific language activities and strategies for expected outcomes and components of communicative language competence in language for electrical engineering and information technology. The sources of data were undergraduate and postgraduate students, language teachers, technical specialists, and perspective future employers. The instruments used were semi-structured questionnaires and interviews. The author presents her work as a contribution to a deep-felt need for standardising various levels of language proficiency at European universities in order to provide a basis for the mutual recognition of language qualifications.**

Index Terms **-** European compatibility, specificity of teaching and learning, standardising foreign language knowledge.

INTRODUCTION

In the real world there is an increasing demand for specific language knowledge and linguistic competence. An important aspect of university language teaching is to prepare students for the real world, and to make them aware of language used in both professional and academic settings. In addition, the growth of globalisation, the process of European integration, and the introduction of technological innovations strongly underline the need for academic mobility and international compatibility between university language programs.

In order to meet the demands of the Europeanisation and specificity of teaching and learning the idea of standardising foreign language knowledge has been adopted at Brno University of Technology. The process of standardising is presented through the description of constructing a flexible standard for world languages for students of the Faculty of Information Technology and the Faculty of Electrical Engineering and Communication. However, the standard can also be applied, with such adaptations as prove necessary, to particular situations at other technical universities.

The *Common European Framework of Reference for Languages* (CEF) [1] was used when ensuring the international compatibility of the newly-constructed standard. Since the *Framework* deals with General English, the European criteria and requirements for language education in this document had to be adapted to fit the specific needs of technically-oriented students.

METHOD OF STANDARD CONTENT DEFINITION

When defining the content of the standard, our efforts were directed at strengthening professional, specific orientation of teaching and learning a language of electrical engineering and information technology because such an approach contributes to students' mobilities and makes our graduates and postgraduates more competitive in the open labour market.

Respecting specific needs of a particular science is a fact about which the literature agrees, over which there is no dispute (Dudley-Evans & St John [2], Hutchinson & Waters [3], Jordan [4], Mayo [5], Shortis [6], Swales[7], to mention just a few). The importance of language within specific professional fields can also be seen in the number of papers published in journals whose focus is exclusively on English for Specific Purposes, such as *English for Specific Purposes* [8], *The ESP SIG Newsletter*[9], *Journal of English for Academic Purposes* [10] and others. Specificity has become central to the teaching of foreign languages in university contexts. According to Hyland, the success of such an approach to language use *"is largely due to ESP's*[1] *distinctive approach to language teaching based on identification of the specific language features, discourse practices and communicative skills of target groups and on teaching practices that recognize the particular subject-matter needs and expertise of learners"* [11].

I. Needs Analysis

In order to select and prioritise specific language activities, strategies, and corresponding components of communicative language competence in technically-oriented language a thorough needs analysis was carried out. The process of

[1] English for Specific Purposes

determining students' needs is very important. Dudley-Evans and St John claim that *"needs analysis is the corner stone of ESP and leads to a very focused course"* [12]. Stressing students' target goals and prioritising specific language competencies are central for LSP[2]. The idea of necessity of needs awareness clearly distinguishes LSP and General English and has helped decouple university language teaching from the "grammar" or "writing" approaches of earlier days [13] – [16].

II. Subjects

Both insiders and outsiders were involved in the needs analysis conducted in 2005. The sources of data were undergraduate and postgraduate students, language teachers, technical specialists, and perspective future employers whose needs were also collected. Out of 980 possible respondents, 160 were selected to participate in a research sample.

- Out of 305 students at the Faculty of Electrical Engineering and Communication and 388 students at the Faculty of Information Technology, 80 (40 students from each faculty) were randomly selected to participate in the research. These students were independent users of English language, i.e. learners at the intermediate level. They completed the questionnaires "on the spot", and anonymously. No time limit was imposed but it took respondents between 15 to 20 minutes to complete the questionnaire.
- Out of a corpus of 14 teachers working at the Department of Languages of the Faculty of Electrical Engineering and Communication, 11 EST[3] teachers completed the questionnaires and were individually interviewed. Next to that, two outside ESP teacher trainers from different technical universities were asked to evaluate the process of the needs analysis and creation of the foreign language standard.
- Out of a corpus of 229 technical specialists, i.e. teachers from technical departments who were independent users of English language, 36 professors, associate professors and senior lecturers representing all technical departments at the above mentioned faculties were intentionally selected.
- University outsiders - 44 perspective future employers of the graduates from both faculties - were asked for help. The relevant employer companies were derived from graduate destination data at the faculties. Recruitment Coordinators or Human Resources personnel in these companies were sent a questionnaire and were asked to pass it on the appropriate people within their organisation. Out of 44 questionnaires, 33 (75%) were completed and sent back.

III. Instruments Used for Data Collection

The instruments used for data collection were as follows:

1. semi-structured questionnaires for undergraduate and postgraduate students, language teachers and perspective future employers;
2. semi-structured interviews for technical specialists and for language teachers.

The procedure was the combination of quantitative and qualitative approaches. The qualitative approach is seen in the open-ended questions of the semi-structured questionnaires and semi-structured interviews which asked for further respondents' comments.

Different types of scales were included in the questionnaires:

- statements with a Likert scale of responses (from A = *strongly agree* to E = *strongly disagree* with the possibility of N = *I don't know*);
- bipolar five-point scales ranging from *extremely difficult* or *extremely important* (1) to *extremely easy* or *not important at all* (5) with the possibility of N = *I don't know;*
- five-point scales asking for the order of items according to their importance with each number being used only once.

IV. Validity and Reliability of Instruments

Unfortunately, no questionnaires corresponding to the needs of students of electrical engineering and information technology were found in the literature. This is why questionnaires respecting students' specific needs were worked out. For this reason, validity and reliability had to be taken into account.

Content validity of questionnaires and interviews was supported by the procedure of triangulation when more sources of information (four groups of respondents) and more research techniques were used when investigating the identical reality. The questionnaire for undergraduate and postgraduate students was piloted before distribution through a group of 30 students of English both in writing and an interview. The revised variant was discussed with language teachers at the department, with subject specialists from the university and two outside evaluators were asked to express their opinion as well. The following corrections were made and incorporated as a result of the piloting process: simplification of task wording, inserting more examples, reconstruction of some parts, adding new activities, omitting some originally proposed activities. The final version (72 items) was approximately 20 per cent shorter than the originally drafted questionnaire. The applied criteria and requirements of European language education supported content validity as well.

When testing reliability, the following measures were taken:

- A method of repeating the students' questionnaire with a group of 16 students. They completed the same questionnaire twice in two weeks. The reliability coefficient was 0.96. This result shows that students almost did not change their opinions within those two weeks.

[2] Language(s) for Specific Purposes
[3] English for Science and Technology

- Check items were inserted in the interviews and students' questionnaire – the same question differently worded was given to respondents twice with the results being expected to be similar. The results were 0.882 and 0.778 with students, 0.917 with technical specialists and 0.909 with teachers of languages. These results suggest good agreement of answers.
- Reliability can also be expressed in a term of internal consistency. This is why the questionnaire for students was checked with the help of Cronbach Coefficient Alpha. The acceptable range for Cronbach Alpha is usually between 0.7 – 1.0. Our result was 0.746; therefore, we may conclude that the questionnaire has internal consistency.
- Only fully completed questionnaires were used for statistical processing.

V. Content Areas

The needs analysis was designed to meet the following goals:

1. To define specific objectives that should be reached by students.
2. To set language activities and strategies in electrical engineering and computer technology education for spoken interaction, spoken production, listening, reading and writing at the levels B1 and B2 of the *Common European Framework of Reference for Languages.*
3. To specify corresponding components of communicative language competence, i.e. which linguistic, sociolinguistic and pragmatic competences students will have to develop in order to achieve required language activities.

For this reason, designs of interviews and questionnaires were different with each group of respondents. A brief overview of content areas covered in the questionnaires and interviews is given in appendices at the end of the paper. Appendix I includes identical items for all groups of respondents, Appendix II contains items which were identical for language teachers and technical specialists and Appendix III covers items discussed only with language teachers.

VI. Data analysis

The needs analysis generated the quantities of data that were statistically processed with the help of the EXCEL computer software; statistical hypotheses tests on homogeneity were carried out in the STATGRAPHICS program. When interpreting statistically processed and analysed data, each group of respondents was included with the weight of 25%. Interpreted data were transformed into information for the following levels of the standard:

- *Goals and objectives* that should be reached**.**
- *Expected outputs,* i.e. communicative language activities for spoken production, spoken interaction, reading, writing, and listening at the levels B1 and B2 on the *European Framework* scale. They reflect the needs of technically-oriented students in both educational and occupational domains. The outputs do not only describe what students can do but also the way how they can do it with the help of communicative strategies connected with reception, production and interaction (e.g. asking for repetition or reformulation time from time).
- *Communicative language competence* which contains *linguistic, sociolinguistic and pragmatic competences* the students will have to develop in order to master technically-oriented language activities required in the *Expected outputs.* These skills and knowledge were defined only by the group of language teachers.
- *Topics* containing both technically-oriented and generally-oriented themes.

Evaluation standards in the form of language tests are being worked out at present in order to examine the degree to which the standard goals and objectives will be achieved by students.

It should be pointed out that the definition of the standard content is not absolute. It is open to further modifications, extension or reduction. Only using the standard in real life and follow-up investigations will show if our perceptions of student needs were correct and in which areas the standard content should be changed.

VII. Degree of Specificity of Texts and Tasks

Research activities connected with the content definition of the standard included investigation focused on a degree of text specificity, i.e. on the proportion of Language for Specific Purposes versus General Language. Both the descriptive research and the relational research were carried out. The research sample was formed by a group of 47 technical teachers and teachers of languages. A semistructured interview was the instrument used. Four types of texts with different rate of specificity were offered to the respondents and they were asked to choose a suitable type of the text. The results of the descriptive research were the following:

- 64.5 % respondents recommended work with sub-technical texts on subjects related to electrical engineering and information technology and adapted according to the language proficiency of students;
- 47.1% respondents recommended not adapted sub-technical texts;
- 45.7% respondents recommended popular scientific texts;
- 38% respondents suggested authentic specialist texts as suitable ones.

These results were fully compatible with the result of the relational research in which it was proved that both technical teachers and language teachers gave priority to sub-technical texts over authentic specialist texts.

STANDARD INTERNATIONAL COMPATIBILITY

In order to achieve the international compatibility European criteria for language education were applied to the newly-constructed and technically-oriented standard. These criteria

are formulated in a document called the *Common European Framework of Reference for Languages* [1] published by the Council of Europe. The document provides a common basis for the elaboration of language syllabuses, curriculum guidelines, examinations, textbooks etc. across Europe. It defines six broad levels of language proficiency:

- levels A1 and A2 for basic users;
- levels B1 and B2 for independent users (these two levels were chosen for students at our university);
- levels C1 and C2 for proficient users.

The levels of achievement are accompanied by a system of illustrative word descriptors for communicative language activities, strategies and components of communicative language competence for spoken production, spoken interaction, reading, listening, and writing. The Descriptive Scheme and the Common Reference Levels provide a grid which can be used for teacher-assessment, students' self-assessment and for comparison of institutional frameworks to each other.

The *Framework* is being applied to many European school systems at the primary and secondary levels as well as at the universities. Therefore, implementing the *Framework* into our language program seems to be the optimal way of increasing the transparency and understanding of the means and outcomes of foreign language instruction and evaluation; it seems to be the optimal way of achieving national and international benchmarking of our language program.

As the *European Framework of Reference* deals with General Language, its adaptation to Language for Specific Purposes for students of electrical engineering and information technology had to be done. The relating of the technically-oriented standard to the *European Framework of Reference* was carried out with the help of a procedure called constant comparison. In this procedure, selected categories of the European language education were compared with corresponding categories of the newly created and technically-oriented standard at the B1 and B2 levels on the *European Framework* scale.

Selected and compared categories were the following:

- aims and objectives of foreign language teaching and learning;
- communicative receptive, productive, and interactive language activities and strategies;
- communicative language competence consisting of linguistic, sociolinguistic, and pragmatic components;
- Common Reference Levels and illustrative word descriptors;
- autonomous learning;
- assessment;
- value education.

The procedure of constant comparison influenced the whole structure of the standard: the goals and objectives, the expected outputs, the components of communicative language competence. It also influenced an accompanying *Bank of word descriptors* for required technically-oriented language activities and strategies of spoken production, spoken interaction, reading, listening and writing. Descriptors in the *Bank* are compatible with illustrative descriptors at the levels B1 and B2 on the *European Framework* scale. But because the *European Framework* descriptors describe General English, the *Bank* descriptors were either adapted to fit the specific needs of technically-oriented students or completely new descriptors were developed according to the guidelines given in the *Framework* [17]. The descriptors are used for students' self-assessment and their potential is in their use as a tool for motivation and awareness raising. They help students realize their strengths and weaknesses, plan their self-directed learning and give them greater control over their learning process.

In spite of full attention given to the process of relating the *European Framework of Reference* to the newly-created standard, difficulties influencing the standard validity should be pointed out here. They were met when adapting the European descriptors to the specific needs of technically-oriented students and when developing new descriptors. This is why we speak about *relatively* reliable relating which is necessary to confront with real life.

CONCLUSIONS

Standardising foreign language knowledge at Brno University of Technology was presented by the description of constructing the standard for world languages for students of the Faculty of Information Technology and the Faculty of Electrical Engineering and Communication. Since the standard is open and flexible, it can reflect changing needs of students, new requirements of the real life. Standardising foreign language knowledge benefits the university language teachers in that it outlines learning priorities and helps them make their teaching effective and practices professional. It raises the quality of the language education programme, provides national and international benchmarking, encourages co-operation.

Standardising does not require the same content of teaching instruction in various institutions; only the expected outputs should be comparable with a certain norm or a standard. In our case, these norms are represented by the European criteria and requirements for language education and the Descriptive Scheme and the Common Reference Levels of language proficincy. The underlying concept of such standardisation is expressed in the words of professor Voß, the author of an academic certification language system UNIcert® who speaks about "s*eeking comparability rather than identity, allowing for variation yet following the common principles* " [18].

APPENDIX I
IDENTICAL ITEMS FOR ALL GROUPS OF RESPONDENTS

1. Order of importance of five language macro-skills of spoken production, spoken interaction, reading, writing and listening.
2. Sociolinguistic knowledge and skills - responses to statements on a five-point rating scale:
   2.1 Teaching and learning should include information on target culture.

2.2 Knowledge of politeness conventions promotes successful business negotiations.
2.3 Students should be aware of register differences (neutral, formal, scientific etc.).

3. Spoken production – responses on a five-point rating scale:
   3.1 Giving presentations on a range of subjects related to students' field of study
   3.2 Making oral presentations on own qualifications and experience
   3.3 Verbalising numerical expressions (fractions, decimals, percentages, formulae and equations)
   3.4 Describing graphs, tables and trends
   3.5 Explaining a viewpoint on topical issues of students' field of study
4. Spoken interaction – responses on a five-point rating scale:
   4.1 Reactions relating to a professional topic:
   - asking for clarification (requesting repeated or additional information);
   - interpretation check (interpreting the speaker's words, using an example as a check);
   - disagreeing/agreeing;
   - indicating non-comprehension.

   4.2 Telephoning
   4.3 Being interviewed
   4.4 Information exchange on topics based on reality (popular scientific texts, technical texts, topical issues from students' field of study)
   4.5 Practical goal-oriented co-operation
   4.6 Participation in discussions related to students' field
   4.7 Explanations and instructions on the most common faults in technical equipment and tools
5. Reading comprehension – responses on a five point rating scale:
   Work with the following types of texts
   5.1 Scientific and technical texts on subjects related to electrical engineering and information technology
   5.2 Popular-scientific texts
   5.3 Correspondence
   5.4 Electronic mail
   Skills relating to work with texts
   5.5 Using monolingual dictionaries efficiently
   5.6 Deducing the meaning of unknown words on the basis of their morphological structure (prefixes, roots of words, suffixes)
   5.7 Deducing the meaning of unknown words from the context
6. Writing – responses on a five-point rating scale:
   6.1 Structuring an academic article (introduction, writing the main body, conclusion)
   6.2 Writing an abstract
   6.3 Writing business letters
   6.4 E-mail messages and chat language
   6.5 Making notes for future reference
   6.6 Taking down messages
   6.7 Completing forms and questionnaires
   6.8 Writing a letter of job application
   6.9 Writing curriculum vitae
   6.10 Writing reports (e.g. laboratory protocols)
7. Listening – responses on a five-point rating scale:
   7.1 Listening as a member of live audience (lectures, talks, reports and other forms of academic/professional presentation within students' own field)
   7.2 Note taking on the basis of a heard text
   7.3 Listening to public announcements (information, instructions, warnings)
   7.4 Listening to audio media (tape-recorder, PC, TV)
   7.5 Listening to conversation between native speakers

APPENDIX II
IDENTICAL ITEMS DISCUSSED WITH LANGUAGE TEACHERS AND TECHNICAL SPECIALISTS

1. To select and prioritise reading purposes (to obtain information, to read and follow instructions, to read for general information etc.).
2. To select and prioritise reading strategies and skills utilised in reading (skimming; scanning; reading for detailed understanding; reading for implications; distinguishing between relevant and irrelevant information; distinguishing between ideas and examples and opinions; drawing conclusions; understanding graphic presentation-data, diagrams etc.; understanding text organisation, e.g. relationship between and within sentences, recognising discourse markers).
3. To discuss the degree of specificity of texts and tasks corresponding to the levels B1 and B2 of a *Common European Framework of Reference* (popular-scientific texts, semi-technical adapted or not adapted texts on subjects related to electrical engineering and information technology, authentic specialist texts).
4. To select and prioritise types of listening (for gist, for specific information, for detailed understanding, for implications etc.).

APPENDIX III
ITEMS DISCUSSED WITH LANGUAGE TEACHERS

1. Communicative language competences: which components of linguistic, sociolinguistic and pragmatic competences our students will have to develop in order to achieve required professionally-oriented activities and knowledge in the educational and occupational domains.
   1.1 The following components of *linguistic competences* were discussed:
   - *lexical competence* (the level of specificity of vocabulary and the range of vocabulary);
   - *grammatical competence* (passive voice, nominalization, word order, articles, achieving objectivity and formality in academic style, verb tenses in EST);
   - *phonological competence* (the tolerance of errors in pronunciation and intonation);
   - *orthographic competence* (the issues of spelling, punctuation and layout).

   1.2 The following components of *sociolinguistic competence* were discussed:

- intercultural skills (the ability to identify and use a variety of strategies for contact with those from other cultures in business talks, when studying abroad or participating in international projects);
- politeness conventions ("positive" politeness, "negative" politeness);
- register differences (differences in level of formality).

1.3 The following components of *pragmatic competences* were discussed:

- discourse competence (the ability to arrange sentences in sequence so as to produce coherent stretches of language);
- functional competence (language functions for oral and written presentations such as classification, comparison and contrast, definitions, emphasis, generalisation, cause and effect, paraphrasing for academic writing and speaking; language functions for oral interaction such as agreeing/disagreeing, expressing an opinion, stating a criticism, persuading, giving an example, giving a reason, commenting, introducing, interrupting, taking the floor, helping the discussion for oral interaction).

2. The development of students' study skills and heuristic skills was also discussed (developing students' ability to use available materials for self-directed language learning, the ability to raise awareness of own strengths and weaknesses as a learner, the ability to identify own needs and goals).

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