

# Teaching Technical Vocabulary at Universities: Which, How and When?

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**Abstract:** Technical vocabulary is generally considered a marginal section of the total vocabulary needed by language learners to communicate in the foreign language. As such it is not included in the main production of language textbooks, which brings several challenges to the language instructors who are required to teach it. This paper reviews several aspects related to teaching technical vocabulary: how to identify it and select it, how to present it to the learners, and at what stage of language learning we can introduce it. Although the examples of good practice were taken from the domain of engineering, it is assumed that the methods and approaches have a great potential to be applied in teaching languages to all university students.

**Key words:** technical vocabulary, LSP, engineering, CEFR framework

## Introduction

Teaching technical vocabulary poses several challenges on the language instructors, especially when they do not have any background in the discipline the vocabulary is related to. Although vocabulary is only one component of a successful language course, in LSP course it is the technical vocabulary which is assigned high priority (Nation 2001, Tongpoon-Patanasorn 2018, Koenig, Guertler 2018). Thus, vocabulary may be seen as building blocks which the students need so that they can speak and write about their work, projects and future career. When selecting the vocabulary, language instructors usually need to clarify several things. Firstly, it is necessary to define what is technical vocabulary and how to distinguish it from other vocabulary when the language teacher is not a member of the community using the technical jargon (Nation 2008, 2013, Tongpoon-Patanasorn 2018). Secondly, having selected the key vocabulary, it is necessary to decide how to present the vocabulary, how to select study materials. For example, after 10 years of teaching experience, it seems that students of engineering do not like role plays, as they are very pragmatic, and thus not willing to learn something they think they do not need or will not be able to use. They prefer “solve” real problems based on their experience. And thirdly, it is necessary to decide in which year of their studies the students are ready to attend the course of technical language. The Czech university curricula typically require students to have minimal knowledge of general language before enrolling in a LSP course, but recently a team of language instructors involved in the Global Engineers Language Skills (GELS) project have claimed that it is not only possible but even wanted to implement technical topics and vocabulary into the university language courses from the beginner level (Rinder, Geslin, Tual 2016).

Based on the personal experience of a language instructor at Brno University of Technology without the background in engineering, and several discussions with the instructors of ESP/LSP at the recent LSP conferences (LSP in Higher Education, Brno 2017, Cercles 2018, Zvolen 2018) and workshops (GELS training week 2017 and 2018), this paper aims to suggest answers to these basic questions when designing a new course or selecting new topics for a technical English course.

## **Background**

The approach to teaching languages at the Czech universities is based on the general notion that university language courses should provide specialized instruction relevant to the main subject of the study in order to achieve the language requirements recently formulated in the Government Regulation No. 275/2016. In the part II. Profile of a Graduate it is stated that “A degree programme is conceived in a manner so as a student proves during study his/her ability to apply acquired specialized knowledge, specialized skills and general qualifications at least in one foreign language” (2016: 10) but there is no guidance how to achieve this goal.

Thanks to the CASAJC survey of language teaching at several Czech universities (Koblížková 2017), now we know that Czech bachelor’s and master’s students get the language instruction in the following typical setting: students have a solid knowledge of general language from their secondary school ranging B1–C1 of CEFR, the language course is typically 12–14 weeks long including 26–40 hours of instruction, and students need to complete 2–4 semesters of language instruction in order to attain the overall goal. Though at Brno University of Technology, it is usually only one or two semesters of language instruction awarded with 1–6 credits per semester thus restricting the extent of direct instruction time to a minimum. Therefore, such one-semester course may cover only a restricted number of specific goals and should focus on selected skills which require technical vocabulary.

Concerning the skills that students of technical universities need we can rely on the recent findings of the Global Engineers Language Skills (GELS) project which has the aim “to investigate which communication skills are most used by engineers in industry and, ultimately, to prepare a teaching guide for language departments that work with engineering students” (Rinder, Geslin, Tual 2016). In their paper the authors present the results of the survey among the engineering students graduates and their adaptation of the Common European Framework of Reference for Languages (CEFR) which emphasizes the specific needs of engineers and thus highly applicable to the students of engineering.

For the purposes of teaching, we may use the following definition of technical vocabulary, or subject-specific terminology: “words that are closely related to the content of a particular discipline” and “particularly useful for learners with specific goals in language use, such as reading academic texts in a particular discipline, writing technical reports, or participating in subject specific conferences” (Nation 2013: 303). Although technical vocabulary usually comprises only small part of general texts/discourse (up to 5% in Nation 2013), in technical texts, Chung and Nation (2003) claim it makes up 31.2% of running words in anatomy text but could be even higher in other disciplines.

## **1 Which technical vocabulary**

As Sophia Butt (2015) suggested in her paper, it is possible and advisable to ask help from the subject specialists to provide topics and/or texts for university language courses, but there might be several drawbacks in that the texts might be “overspecialized”, concerning such narrow topics which would not be accessible to the majority of (undergraduate) students, neither to the language teachers. Moreover, professors tend to be very busy and not available to consult the “true” meaning of the terminology in their selected texts when the dictionaries offer several meanings and/or translations. Even if a good and reliable dictionary is available, as e.g. the Oxford Dictionary of Architecture, still there is this impending question which out of the thousands of words and phrases to choose, so that within a relatively short period as one semester the students will have vocabulary to produce meaningful texts and discourse.

To narrow down the range of topics, I followed the general approach that university language courses should reflect the overall goal of the study programme (as stated in the Government Regulation No. 274/2016), which we may consider a legitimate goal of language course. Students of technical universities usually work on several projects which they create in their domain specific courses of engineering and later develop and publish in their bachelor’s and/or master’s theses. Language courses can be designed to enhance students’ skills which they need to present their projects.

To identify the core vocabulary for the ESP courses at Faculty of Civil Engineering BUT, language instructors in cooperation with a team of doctoral students collected and analysed 370 abstracts of bachelor’s and master’s theses which are available publicly at the university website. The theses and namely their Czech and English abstracts helped language instructors to identify frequent topics of the projects which might be discussed in LSP lessons.

Although the quality of the English abstracts might be questionable, as in the abstracts of BUT students has been identified many grammatical and terminology

mistakes, generally the abstracts may serve as a relevant source of terminology as they were written by students who were just about to become professional engineers, were reviewed by the supervisors, i.e. professional engineers, and reflect current problems and their solutions in the engineering discipline.

Thanks to the generous cooperation of the six doctoral students of civil engineering and a small financial support of the Faculty of Civil Engineering (FCE), in 2014 the team collected 370 Czech and English abstracts of bachelor and master theses published in 2012–2013. The doctoral students who had the experience of writing their own bachelor's and master's thesis, working experience in engineering practice, and also teaching engineering, analysed the terminology in the abstracts and extracted the most frequently used terminology which they considered important and useful within the domain of their specialization. The resulting glossary contains 2700 entries of the most frequent terminology in the field of civil engineering and since 2015 it has been available as a Czech-English electronic glossary of building terminology at the website of the Faculty of Civil Engineering, BUT ([www.fce.vutbr.cz/slovník](http://www.fce.vutbr.cz/slovník)) – for more details on the development of the glossary see Tluková (2018).

From the high frequency of searches in the time when students need to hand in their theses can be seen that the glossary serves the primary function and students use it to translate their abstracts into English. After four years of online operation and more than 130 000 searches, the on-line application has produced several statistical data which may have further applications in teaching ESP: a constantly updated list of the most frequently searched terminology, a database of users' suggestions of new terminology to insert into the glossary, and users' evaluation. While the users' suggestions represent a way how to constantly enlarge the glossary, the users' evaluation (currently the average evaluation is 1.4 on the scale 1 excellent, 5 not satisfied) reflects if and how the users' needs were met. But when designing a new course of technical vocabulary, the list of most frequently searched vocabulary may be seen as the core technical vocabulary for the students of civil engineering and architecture. Table 1 shows the first 20 most frequently searched items stating that more than 500 students of FCE did not know the English word “concrete”, almost 400 did not know “floorplan” etc.

The first 20 terms can be divided into four groups: description of the structure and its parts (konstrukce, sloup, nosník, strop, vazník, překlad, deska, výztuž), materials (beton, cihla, železobeton), documentation (půdorys, řez, pohled) and phases of construction (návrh, stavba, novostavba, objekt) which are necessary to describe any building project and thus be seen as the key words which need to be learned early in the technical English course and further practised in various contexts. Eventually the first 100 most frequently searched items might comprise

Tab. 1: *The most frequently searched vocabulary in Czech-English online glossary of building on 15/12/2018*

No.	Term	No. of searches	No.	Term	No. of searches
1.	beton	515	11.	strop	269
2.	půdorys	398	12.	vazník	266
3.	konstrukce	325	13.	stavební	257
4.	cihla	323	14.	stavba	248
5.	sloup	322	15.	pohled	235
6.	nosník	319	16.	překlad	234
7.	řez	310	17.	novostavba	233
8.	výztuž	294	18.	podlaží	211
9.	návrh	275	19.	deska	207
10.	železobeton	272	20.	objekt	202

the “backbone” of the texts and activities practiced during the one semester LSP course.

Thus, compiling a list of key technical vocabulary based on the students’ needs helped to identify the core topics in civil engineering and simplified the selection of teaching materials, as for example authentic texts containing the frequent engineering terminology.

## 2 How to select materials

Teaching technical vocabulary naturally relies on the same methodology as general language courses which is practically summarized in the extensive Paul Nation’s book *Learning Vocabulary in Another Language* (2013). The book provides a battery of standard methods how to teach vocabulary, though direct teaching of forms and meanings is seen only as one strand of a well-designed course. Nation reminds us that “the learner should have the opportunity to learn new language items through listening and reading activities where the main focus of attention is on the information in what they are listening to or reading” (Nation 2013: 2).

The aspect which makes teaching vocabulary at universities different is the restricted time of one semester course and high demand for useful vocabulary and meaningful activities based on the students’ needs as students have several ways how to immediately express their level of satisfaction: in regular course evaluations or eventually by cancelling their registration in an optional course.

The language needs of engineering students were clearly identified in the recent paper by Koenig and Guertler (2018) who performed a survey among the first-year engineering students at two universities of applied sciences (UAS) in southern Germany. The study revealed that students with longer work experience perceived higher importance of listening comprehension, reading comprehension,

process description, and test and measurement documents reading and writing than grammar or presentation skills or academic writing. Thus, it seems that instead of training how to write technical documents in a perfect form, the ESP lessons should focus on communication and interaction of students about technical topics.

When selecting the texts to cover the key vocabulary, language teachers who rarely have background in the technical domain of their students may rely on the available language text books (e.g. Longmans' Technical English series, Cambridge's Professional English in Use series, or Oxford's Technology series) which are usually general in their scope and thus sometimes it is difficult to develop the topic into the desired discussion.

Another approach is to have a new "custom made" textbook which reacts to the students' needs and topics in the field. One of the new textbooks which employs "a wide variety of authentic materials" is *English for Chemical Engineering* (2017) by Dr. Goni Togia which is intended not only to "enhances the knowledge of specialised English" but also to "engage students with the writing conventions of different text types" (ranging from engineering textbooks, research articles to popular science magazines). Thus, the students learn vocabulary in its authentic context as well as the way the terminology is used in the professional texts in their field, which opens many topics for discussion.

To find out more about the language instructors' approaches, an anonymous micro-survey among the teachers of ESP was performed at the GELS workshop in Stockholm 2018. The aim was to identify the sources which teachers prefer when designing lessons of technical English. The 12 respondents who stated to have 4–20 years of experience (10 years on average) of teaching ESP were given three short extracts of texts on the topic of technical drawing, a topic common to all engineering students, from different sources. Text 1 was taken from Wikipedia.org, Text 2 from a website run by the community of architects and civil engineers [www.designingbuildings.co.uk](http://www.designingbuildings.co.uk), and Text 3 was taken from the textbook *Professional English in Use* (CUP 2009) by Mark Ibbotson. This selection of text types should represent the main sources currently available to teachers: general English texts, authentic technical texts (written by professionals) and textbooks (written by language instructors, possibly in cooperation with the professionals).

All the 12 respondents have clearly stated that among the presented texts they would choose Text 2 to introduce the terminology for drawings to the students whose command of general English is at the B1/B2 level. When giving their reasons why they selected Text 2 to teach the chosen vocabulary, six teachers mentioned the vocabulary which they considered technical, appropriate, well-explained and useful for the students, and five teachers pointed out the source which they considered technical, professional, authentic and not encyclopaedic.

Four teachers also emphasized that Text 2 seems to be more detailed, informative and reader-friendly, while two teachers complained about the typographical errors and they would prefer to pick the strong points of all texts and synthesize a new text. Overall, this micro-survey has revealed that once the LSP teachers get extensive experience, they clearly prefer authentic texts to create teaching materials as they seem to be more interesting and stimulating for the university students.

### **3 When to teach technical vocabulary**

To counterbalance the general belief that technical vocabulary should be covered in higher levels of language instruction, the GELS team have developed a grid of skills which are relevant to the profession of the students of engineering starting at A1 level of CEFR. The authors claim that when teaching university students (and adults in general) who typically know their goals why to study a language, these learners are ready, and glad, to learn how to speak and write about the topics highly relevant to their work, including technical vocabulary.

As we can see in the adapted framework of the GELS project (available at: <https://www.language-unit.eng.cam.ac.uk/news/GELS>), which is based on the language and communication requirements of engineers which the GELS team have clarified by the means of surveys completed by engineering graduates working in industry, there are language skills which might be implemented into the language course syllabus as early as the beginner (A1) and developing throughout the whole process up to the proficiency level (C2) (Rinder, Geslin, Tual 2016 and later). Thus, mapped against the skills and proficiency levels (A1–C2) of the Council of Europe's CEFR and, the framework reflects the specific needs of engineering students which might be taken as the overall goals of the technical language lessons.

### **Conclusions**

This paper summarizes some of the current good practices on teaching technical vocabulary in LSP courses. It shows an alternative way how to select the core vocabulary for a course via analysis of students works. It suggests that technical vocabulary should be taught in the context of authentic texts written by the specialists in the field which seem to be more engaging and interesting for the students and inspiring for the instructors. And finally, it claims that technical vocabulary, and hence technical/professional discourse, could be learned from very early stages of language acquisition. Nevertheless, these typical dilemmas of LSP instructors which they face when selecting new vocabulary and source texts to create the study materials would deserve further research, e.g. to enhance the novice LSP instructors with some relevant data from the start of their career.

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