ESP Needs Analysis for Language Courses Redesign: a Case-Study from the University of West Bohemia

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Abstract

Given the rapid development of engineering technology and the internationalisation of the Czech labour market, good command of English for Specific Purposes (ESP) among engineers appears to be of crucial importance. In this study, the students from the Faculty of Mechanical Engineering (FST) were asked to comment on their needs and expectations about the content of the English courses they are provided with. These perceptions may greatly help to re-develop and innovate the English for Mechanical Engineering and Academic English courses offered by the Institute of Applied Language Studies at the University of West Bohemia, and engage students and teachers in effective language practice. The case-study method and sequential design were chosen in order to elaborate quality questionnaires to gather the results on students' needs, wants and expectations concurrently. The responses to the survey were evaluated via frequency, correlation and factor analyses. The factor analysis intended to confirm the two unobserved dimensions represented by the survey which were labeled as "Pursuing further education" and "Finding a job". Indeed, if students wish to pursue further education, they do not think about using their English at work and they are interested in learning about writing and citing sources correctly. The results of our study require further research and verification. This will be done by applying mixed research methods and interviewing selected students who took part in the questionnaire. The final step of the research will be to compare the current results with the feedback received from graduate students and prospective employers. The received conclusions are believed to result in developing modern high-quality language courses that will appeal to motivated students and their teachers.

Keywords: *English for Specific Purposes, English for Mechanical Engineering, Academic English, questionnaire, factor analysis, sequential design*

1. Introduction

Given the rapid development of engineering technology and the internationalisation of the Czech labour market, good command of English for Specific Purposes (ESP) among engineers appears to be of crucial importance. Therefore, the authors, who teach English to the students of the Faculty of Mechanical Engineering (FST) at the University of West Bohemia (UWB) in Pilsen (Czechia), attempt to tailor their ESP courses' syllabi to the constantly changing needs of the engineering industry.

There are several ESP courses that the FST students are offered. There are 4 technical English courses available for the bachelor's degree students: "English for Mechanical Engineering 3 (AST3)", "English for Mechanical Engineering 4 (AST4)", "English for Mechanical Engineering 5 (AST5)", and "English for Mechanical Engineering 6 (AST6)". Each subject is taught in one semester; however, only AST6 is a "B" category course (compulsory-elective). The remaining 3 subjects are classified as "C" category courses (elective). It is worth mentioning though that they are commonly chosen by the FST students due to the fact that they are designed to prepare them for the AST6 course, whose level of English proficiency is the highest (B2, according to CEFR). The master's degree students are provided with two "B" category Academic English courses (AEP5 and AEP6), whose level of English proficiency is C1, according to CEFR.

Each course that is offered to the FST students utilises a diligently selected ESP textbook. All technical English courses are taught using textbooks which were designed as a part of a project called "Innovation of the Language Education at the University of West Bohemia" (project no. CZ.1.07/2.2.00/15.0403) by the employees of the Institute of the Applied Language Studies (UWB). Nonetheless, the textbooks were published in the year 2013, and due to the fact that the engineering industry and its needs are constantly changing, some of the materials might seem to be outdated. The Academic English courses, on the other hand, are based on the "Oxford EAP" textbook. Even though the textbook focuses on highly useful academic skills, some of the topics which are offered by the textbook appear vaguely connected to the engineering field (they deal mainly with economics,

psychology and natural sciences). It is worth mentioning that the students enrolled on the AEP courses have been expressing dissatisfaction in the course content, indicating low utility of the discussed topics. Therefore, the authors of the article have noticed the need for innovation of materials in both "English for Mechanical Engineering" and "Academic English" courses. This led to the decision to carry out a needs' analysis among the FST students in April/May 2021. The data included the results of 100 questionnaires gathered over this period of time. This quantitative method of collecting data has been commonly used by researchers conducting ESP needs analysis (Čapková and Kroupová, 2017; Chin-Ling, 2016; Hyun Hyo, 2013).

2. Background and methods

Cummins (2008) stressed that it is crucial to provide language proficiency with ESP approach with English for Academic Purposes (EAP) emphasizing academic proficiency and English for Occupational Purposes (EOP) developing interpersonal skills. In this part of the article the theoretical reasoning for using the analysis of students' needs is linked to modern approaches to course design as both language directions are correctly taught at the Institute of Applied Language Studies. The definitions of needs analysis that were put forward by various researchers can be found in the chapter "Analysis needs" (Basturkmen, 2010, p.17-19). ESP approach signifies the fact that language teaching is "based on the learner's reason for learning". It has been pointed out in multiple research (Basturkmen, 2003; Master, 2005; Johns and Salmani, 2015) that the language needs of the learners relate to common language settings and situations that the students expect to encounter.

The latest development of ESP approach goes in line with Dudley-Evans and St. John's (1998) definition of ESP. The idea that ESP is very effective when relevant to academic and occupational context is widely supported nowadays. In our study we aim to innovate current courses, their objectives and scope so that it could meet the requirements of the students and the faculty. Therefore, it is crucial to analyse all gathered data available using questionnaires. In 2009 Brown described needs analysis as "the systematic collection and analysis of all information necessary for defining a defensible curriculum" (p.269). In cases when the course is already taught it is recommended to practice on-going needs analysis (Basturkmen, 2010) as it helps to understand the changing needs of learners and build on the existing knowledge as their average language proficiency may grow.

As perceptions of teachers and students, university requirements, average language proficiency, language situations and course materials tend to change or become more advanced, it is essential to adjust course materials and objectives and treat this process as a continuous one. Undoubtedly, it is necessary to evaluate the quality of current courses, materials and course objectives (Anthony, 2018, p. 122). Huhta and co-authors (2013) outlined the importance of taking quantitative and qualitative analysis methods together as in this case they can demonstrate more complex students' needs. During the process of course design an approach that would help to adjust the course to the needs and expectations of key stakeholders is planned to be applied. Woodrow described multiple approaches to ESP (2018, p.194) that showcased genre, discourse analysis, corpora and discipline-based methodologies. A detailed description of using a genre concept as a way to introduce students to their target contexts is given in the book by Hyon published in 2018.

One of the most well-known choices for assessing students' needs and expectations is using both qualitative and quantitative analysis methods. Considering the above, there are several designs for a mixed methods research (Creswell, 2014) which typically depend on the rationale as to why it is an applicable and handy design, the time to collect and analyse the data (Creswell, 2014), and what is most suitable for the research questions and problems. In our case, sequential design was chosen as the timeframe was tight to elaborate quality questionnaires to gather the results concurrently. A major advantage of sequential mixed method design is that it is not necessary to make a choice between qualitative and quantitative data, moreover, it is possible to work through the process of course design step by step applying methods one after another. In this particular paper we analyse the results of the students' answers received during the first phase of the project. It is planned to interview selected students at the second phase and have their prospective employers answer the survey questions at the third stage.

As the second method we will be applying a case study method as our project is carried out in the University of West Bohemia and we will deal with employers mostly in the Pilsen area.

3. Results

We created and piloted a questionnaire that contained three sets of questions about students' expectations of using English at their future workplace, language needs and particular technical topics they wish to cover in the course.

We performed frequency analysis for the questions about future professional expectations of students and English language skills they consider to be important to develop. After that, correlation analysis was carried out for specific skills (writing, speaking and reading/listening) in order to capture students' needs and use this information to design the courses.

Figure 1 demonstrates that the students expect they will write formal emails and technical reports in their future jobs. Moreover, speaking skills are expected to be used in the future work environment by the majority of students.
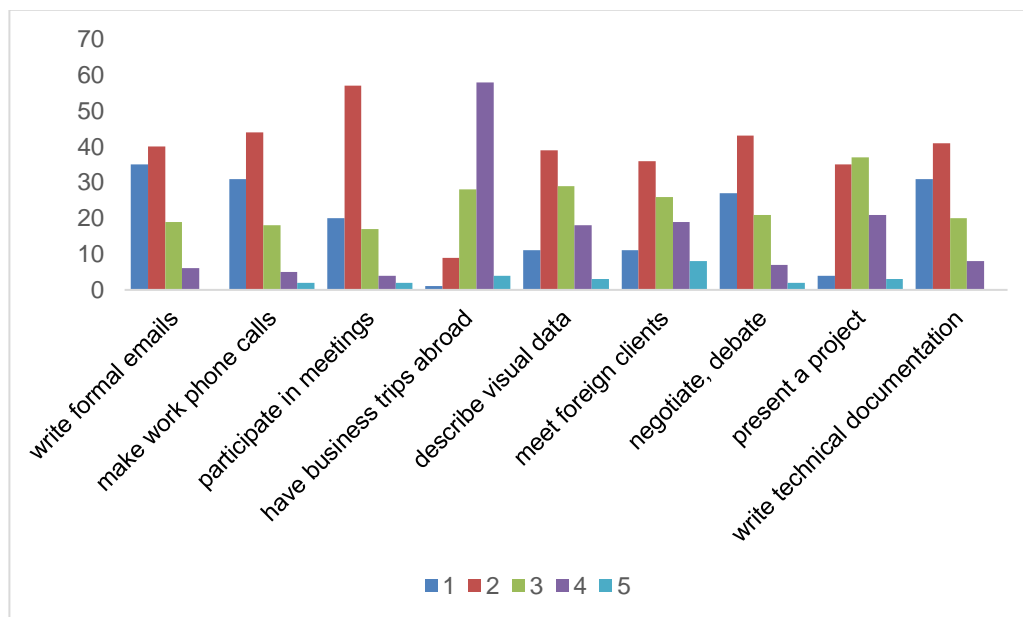

Fig. 1 – How often do you think you will do the following (1 – very often, 5 – never)
[Sources: Authors' own research]

English language skills and their importance for the students of UWB are demonstrated in Figure 2. It is particularly interesting that hardly any students plan to write academic essays or articles. It does not correspond with the current state in course curriculum as the majority of master students of the faculty have to take English for Academic Purposes. One of the central requirements of the course completion is writing an academic essay. This explains why some of the students gave negative feedback on Academic Writing when questioned informally. The majority of students expect to use their English-speaking skills on an every-day basis in their future job.

This raises a question whether the master courses should be redesigned. In that case, the future steps that we plan to take would be to interview graduated students and potential employers in the Pilsen region in order to ensure that the new courses correspond with the needs of the market.
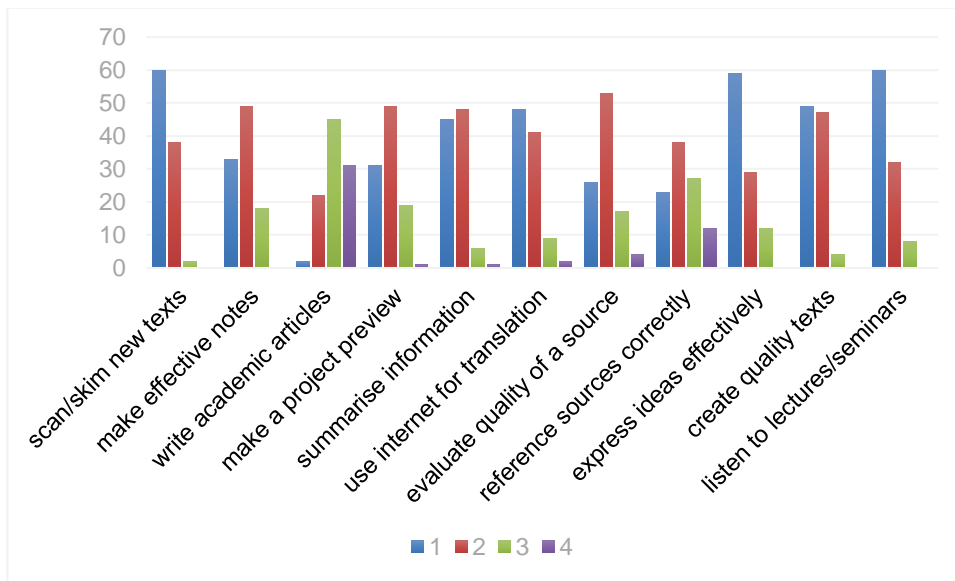
Fig. 2 – How important are the following skills for your future career?
(1 – very important, 4 – unimportant)
[Sources: Authors' own research]

We have divided the questions into specific language skills they address and calculated correlation coefficients for the questions that corresponded to writing, speaking or reading/listening skills. As correlation coefficient determines the extent of linear relationship of two variables and takes values from -1 to 1, it is possible to observe subtle connection (0.3 and 0.4 correspondingly) between writing good texts, writing formal emails and making effective notes. The students who marked one of those as important/expected, are likely to have marked the other two variables as well.

A much stronger connection is visible in speaking skills correlation matrix. We observed speaking on the phone (S_phone), speaking English during business meetings (S_work_meetings), debating (S_debate) and making presentations in English (S_present). The majority of the students find it important to debate, negotiate, make presentations, take part in English language business meetings and make international phone calls. Typically, these answers were chosen by a great number of students. It is implied that the majority of the students might be interested in interactive lessons that would include debates, presentations, negotiations and other formal speaking activities (Figure 3).
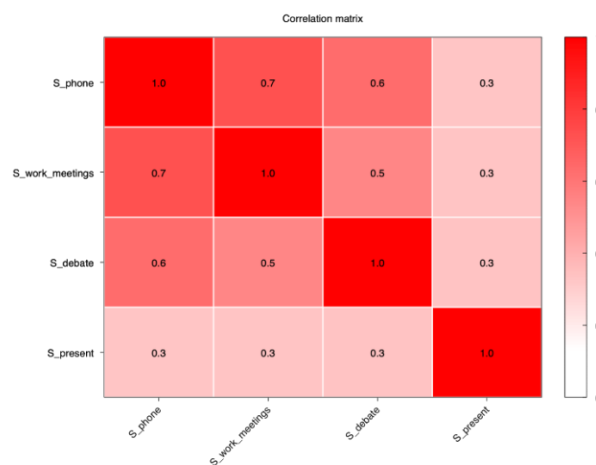

Fig. 3 – Correlation matrix for speaking skills
[Sources: Authors' own research]

As for reading/listening skills, the correlation coefficient returned the value of 0.3 between business trips and listening to lectures and presentations/actively participating in them. All these data reports showcase the importance of redesigning current courses in such a way that would match the needs and expectations of the students with more advanced language skills.

In order to understand which factors in particular could possibly influence students' answers we carried out factor analysis. The idea was to reveal similar patterns in the responses, to find out whether they depend on some unobserved factors. The factors were extracted via Principal factors method (Principal axis factoring) as it is assumed the factors have a common and unique variance and that the students did not always differentiate correctly between "often" and "very often" answers as these measures may be quite subjective. Total variance was explained by 2 factors (we received 2 representative Eigenvalues that determine the total explained variance) that had to be labeled. Varimax rotation was used to interpret factor loadings.

Labelling the factors "Pursuing further education" and "Finding a job" corresponds to the idea that these two factors are negatively related (correlation coefficient -0.77, negative slope, Figure 4 below). We generated plausible factor scores using the regression method as none of the labelled factors is observed directly. This method maximizes validity between the factor scores and the unobserved factor. The regression method was chosen as it maximizes the correlation (and hence validity) between the factor scores and the underlying factor.
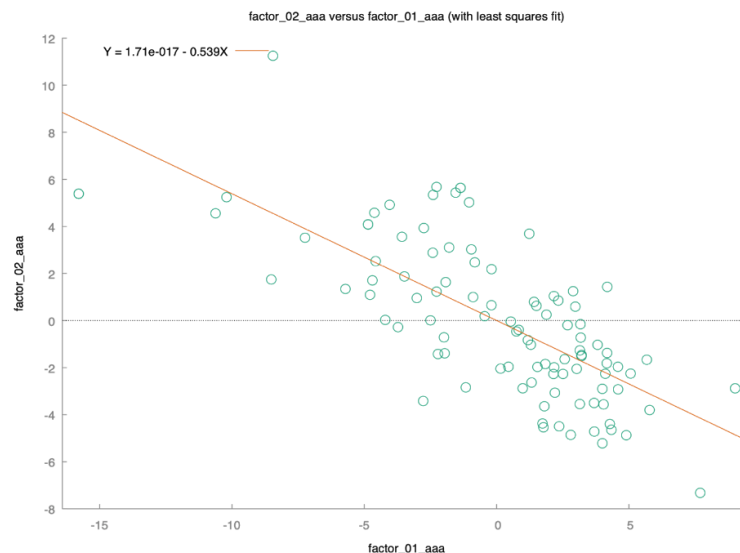

Fig. 4 – Generating factor scores using the Regression Method
Relation of Factor 1 ("Finding a job") and Factor 2 ("Pursuing further education")
[Sources: Authors' own research]

Factor analysis greatly helped to confirm the two unobserved (hidden) dimensions represented by the survey. Indeed, if students wish to pursue further education, they do not think about using their English at work and they are interested in learning about writing and citing sources correctly. On the contrary, those who plan to find a job after graduating from the university are interested in developing speaking and listening skills.

4. Conclusion

The two hidden dimensions indicated by the factor analysis require further research so that the assumed results could be confirmed. This will be done by interviewing selected students who took part in the questionnaire. The sequential mixed method design will allow the authors to verify whether the factors "Pursuing further education" and "Finding a job" have been interpreted correctly. If the further research confirms the assumption, the switch in the focus of the AEP courses might need to be taken into consideration. Due to the fact that the majority of students do not enroll on PhD programmes, it might be worth considering to redesign the AEP courses so that they focus more on interpersonal skills, e.g. negotiating, debating, rather than writing academic articles.

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