



Making Foreign Language Learning University Lessons Interesting for Engineering Students

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Abstract

The purpose of the present paper is to show how we could find means of attracting the interest of students in Engineering during their foreign languages classes, by introducing some content related to their interest. Whenever we teach a group of students, we need to find out what they have in common, which can be based either on their professional interest, age, or technology, as the latter is a major concern for us all nowadays. We all need skills related to using technology, and technology is also a source of entertainment. For students in Engineering, we can use texts related to the domain of the history of engineering, which can include information related to the way Engineering as a field has evolved since ancient times, when the cities' water systems, for example, were surprisingly well-developed. At the same time, as technology is part of the students' everyday life, we can also encourage them to search on social media and on the web for articles related to curiosities in history, which can include information about engineering in the early days of mankind, mysteries, as much as examples of modern-day architecture which can be extremely surprising, in areas of the world such as Asia, where, for example, China and Japan have extreme examples of very fast trains and bridges where traffic is extremely efficient. Technology can be incorporated within the culture and civilization frame, and it can be a topic of interest along with the history of engineering, through texts, documentaries, as well as short video clips and photographs, which can prompt debates and arguments related to expressing personal opinion on various issues. In general, students seem to have studied certain topics already in school and highschool during their foreign languages class, and thus gaining their interest during university classes can be more challenging for teachers.

Keywords: *Essays, arguing for or against, interaction, debates.*

1. Introduction

At the beginning of their academic life, in their first and second years, students at the Technical University of Civil Engineering Bucharest, from various engineering faculties, where the author of the present paper teaches, have compulsory classes of foreign languages once a week. They can choose one foreign language to study for two years from the following: English, French, Spanish, German, and Italian. Teachers need to find ways to make them be interested in these classes, since they have already studied the majority of the grammar and vocabulary issues during school and highschool. English as a foreign is taught in all schools and highschools in Romania, and students need to feel that they are learning something new during these university foreign languages classes. Otherwise, while they do attend the classes, they may not participate actively in them, since they already know most of the issues discussed and feel that these foreign language seminars at university are a simple repetition of their highschool foreign languages lessons.

Some students prefer to choose a foreign language they already know for their first two academic years, as they anticipate that it may difficult for them to keep up with their engineering classes. However, these students need to be further motivated in order to maintain them active during classes. The curricula design approved by the university and which needs to follow the requirements of educational standards present at European Union level requires foreign languages seminars to include active participation of the students, and for the lessons to be interactive. Students are not expected to be passive learners, but, instead, to develop their skills, critical thinking and communication abilities in the foreign language they are studying. The teacher is expected to have the role of a moderator, or communication facilitator, and the foreign language classes are expected to help students using their knowledge of the foreign language for various situations of communication, whether written or spoken. Language has a clearly practical purpose, and foreign languages classes take this practical purpose into consideration.



In order to make students communicate, a friendly environment is very helpful. This environment includes a relaxed interaction between teachers and students, facilitating interaction among students, not making students feel ashamed of doing mistakes, offering materials that are relevant for the students' professional and personal interests, as well as activities which are considered by them to be relevant for situations they may be confronted with during their future professions. The teachers may devise teaching activities for engineering students based on hypothetical scenarios they may find themselves involved in during the future, such as job interviews, holding a presentation presenting a product of their company, their own innovation, or the results of their scientific research, needing to persuade clients that their company's product is the best, creating a convincing presentation of their company's activity, interacting with other engineers during scientific events, where small talk can help them get in touch with possible collaborators, and where they can establish business contacts, arguing for their own point of view regarding an issue based on engineering topics, as well as participating in debates on topics inspired from their future profession or on currently discussed topics in the news. Controversial topics prompt reflection and the articulation of an opinion, which should be based on arguments that can be found based on research and critical thinking. For students to actively engage in activities, these activities need to be interesting and to stimulate their curiosity to find out more about the topics, and then to start reflecting themselves over them. The process is a natural, everyday life one, as on a daily basis, in the news, news that present outrageous, condemnable actions, are commented upon and debated by users on social media. Various issues based on situations causing inner conflict are presented in the media, e.g. if social media has a positive or negative influence on children and teenagers, and if technology actually helps in their development and education. Technology is present in our everyday lives to the point where it has become indispensable professionally, socially, and is also used as a source of entertainment. Thus, engineers are not dealing with technology only in relation to their professional lives. Their personal and social lives also require them to come into contact with it on a daily basis. This makes communication between foreign language teachers and engineering students easy, as difficult, specialized terms from the engineering field are not required for relaxed communication in class. In addition, students have only begun their engineering studies and are in the process of learning themselves, which would make scientific terms in a foreign language difficult for them to know as well, or at least not well enough to communicate spontaneously on the spot.

Once teachers at the Technical University of Civil Engineering Bucharest are asked to not overcharge the curricula for the subjects they teach, holding classes based on interactive activities, developing critical thinking and argumentative skills can become a way to deal with this problem. The materials to read can be topics present in popular science and also throughout the media, to the point where they are among the collective concerns of society. On the spot tasks based on short paragraphs, on which reading comprehension, vocabulary, translation, and discussion exercises can be given provide solutions to this problem of an overly charged curricula, especially in a university whose main specialty is engineering, and not philology. The grammar explanations can also be minimal, adapted to engineering topics and to the needs of engineering students.

Foreign languages for engineers need to be taught in order to both appeal to them and to help them in their future domains of activity.

1.2 Literature Review

English as a foreign language for engineers, which is the subject taught by the author of the present paper, belongs to the field of foreign languages for specific purposes. Research [1] on English for specific purposes (ESP) showed, through questionnaires and interviews, that engineering students wish to learn so that they have good job opportunities. As a result, they are willing to improve their communication skills and to gain knowledge of "professional English vocabulary" [1]. English for specific purposes is chosen by students since English is an international language [2], a fact that would clearly make them have more opportunities for finding jobs, as well as to establish relationships of collaboration with colleagues from all over the world.

Companies nowadays function by having representatives all over the world, due to the transnationalization of the economy [3]. Transnational corporations are a frequent presence in today's business world, and many engineering companies or technology-creating companies such as Philips [4] or Apple [5] are in need of engineers in the Internet and Technology department. Globalization has made possible a different approach to "the global world economic environment" [6] possible through translational corporations, which makes teachers of all disciplines, including foreign languages, to



realize the significance of adapting their curricula for engineering students to the way in which today's world is functioning.

Motivation is the driving force of the learning process. Together with engagement, motivation plays a fundamental part in foreign language learning [7]. Teachers should keep in mind that "increasing motivation can lead to the mobilization of students' personal, cognitive, emotional and behavioral resource" [7]. Technology can be considered a tool to increase the motivation of students to learn a foreign language [7], which is to be expected due to the use of technology "in and outside the classroom, in both formal and informal settings" [7].

Communication uses technology as a tool today, so that written and spoken communication exercises should take the digital world into consideration. Students do not need to write only in-print format formal and informal letters and reports. They also need to know how to address someone by email, whether on formal or informal terms. What is more, social media has become a tool for promoting companies and products, which requires a specific type of written communication as well. The adaptation to the world of today can be done by providing students with an environment that includes technology, since it offers both a familiar working environment and a stimulating one. Environmental psychology [8] draws our attention to the fact that we always have an emotional reaction towards our environment, meaning that it can make it easy for us to focus, it can make us feel calm or agitated, anxious or safe, motivated to participate in activities or, on the contrary, unwilling to engage in class discussions. The environment can be composed by classroom design, including various objects used for teaching, relationships between teachers and students, as well as by the usual activities. The teaching and learning process can include "the use of technological means such as web tools and services, digital games, mobile apps" [7], which are, after all, present in the daily lives of both students and teachers, providing a familiar and, therefore, comfortable learning environment.

All of these previous considerations, regarding motivation to learn, relevance of the foreign language seminars to future professional activity, current lifestyle and preoccupations, current trends in society, are part of needs analysis. Needs analysis for foreign language teaching have included, in the beginning, occupational needs, based on the learners' future profession, then continued with academic language, and further on with general language teaching [9]. The needs refer to how the learners are going to use their knowledge of the studied foreign language, as well as to the way in which teachers estimate they could best master the language in class [9]. Motivation for learning the foreign language is calculated based on the students' needs, and adequate tools are considered.

Within the needs analysis for foreign language learners in general, we can include those of the engineering students. These needs are related to a specific means of communication using English [10], namely those prompted by "Multicultural work practices" [10], and which include "foreign language ability, communication confidence and cross-cultural experience" [10], [11]. Interaction with various cultures is interrelated with professional work, an aspect which should be considered in the teaching and learning activities of foreign languages.

2. Materials and Methods

This section is based on the experience of the author of the present paper while teaching English as a foreign language to students in Engineering. This section contains theoretical aspects which can be put into practice in order to develop an efficient curriculum for the teaching of English for specific purposes in the case of English as a foreign language seminar for engineering students.

The theoretical aspects are related to motivation of engineering students to participate actively in the English as a foreign language class.

The author of the present paper has noticed that exercises with too much difficulty or exercises with too low difficulty are set aside by students, and they can become unmotivated to take part in them and in the related class activities. Homework is also not too much appreciated, and students avoid it by ignoring it. The cause can be related to them finding the homework exercises too difficult or much too easy. Such an attitude towards homework is also visible in the attitude of students towards the exercises given to be solved in the classroom. Students of the engineering faculties are taken seriously with such a request for little or even no homework, due to the demands of these faculties for these students being given less study material and also homework to go through. Too much material to be gone through may lead to complaints from students, especially since foreign language classes are not part of their main specialization.

As a solution, we can consider motivating students to be more active and engaged during classes, and minimal material for them to go through. Hours of self-studying can also be reduced to a minimal number for foreign language classes. Maintaining students active during classes can also be part of



the solution, so that overcharging their activity and effort for preparing for foreign languages cannot lead to them taking time off from their preparing for engineering classes, once engineering is their main speciality.

Foreign language seminars need, therefore, be planned in such a way as to be relaxing, useful, and to require minimal supplementary hours of self-study. This is the reason why interactive classes are crucial. Understanding the lessons from class can be a time-saver for these students.

2.1 Choice of class materials and activities

Based on the students' needs, as well as on the context made up by the demands of the engineering faculties, teachers of foreign languages can devise their activities based on types of materials to be mentioned further in this subsection, in order to motivate students and make them see the connection between foreign languages and their main subjects of study based on their engineering specialization. Texts about the history of engineering, which can be used for reading comprehension and related activities, such as vocabulary learning and debate, next to questions about the understanding of the respective text. Choosing such texts is based on the idea that engineering and technological development are in a strong connection with the very history of human kind, since humans needed to rely on devising tools to help them through everyday life [12], [13]. In order to survive, human beings needed the skills of building [Oliveira], yet it was only relatively recent that the science of engineering was organized and made available to the interested audience [12], [13].

This can be the explanation for the impact of materials about how the field of Engineering has had a history and development ever since the since ancient period, a time when the ancient cities' water systems were so well-developed that they continue to amaze us even in our contemporary times.

Once teachers are aware of the fact that technology is part of the students' everyday lives, they can consider devising activities which can prompt students to do some research on social media, as well as on various web for popular science articles where curiosities from history are mentioned. These curiosities can be about how engineering activities were going on during the early days in the history of human kind, when the first human beings were creating their tools and discovering the first examples of technology such as making fire or creating clay pots, as well as tools for hunting and building shelters. Such materials may be presented to students as a first cultural contact with the early history of engineering, in order for them to become aware of the great extent to which technological progress has evolved in time, namely from basic needs for human survival to needs based on culture, education, intellectual refinement, entertainment, as well as to needs of social validation, which are situated very high, towards the top of Maslow's pyramid of needs [14].

Other materials for the study of foreign languages for engineering students can include the topic of mysteries. Here we can have in mind examples of modern-day architecture which can be very much surprising, from various areas of the world other than our own, Western ones. Thus, in Asia, and namely in countries such as China and Japan we can find examples of extreme cases of very fast-travelling trains, using an incredibly high speed. We can also find bridges where traffic is managed in a surprising and efficient way. This is an example where technology can be included within the frame of culture and civilization, as well as history.

The history of engineering in different ages and in different areas of the world, as well as cultures, can be presented to engineering students by using didactic materials such as texts for reading comprehension, vocabulary learning, debate prompts, together with documentaries, video clips on Youtube, as well as photographs. Through visual materials, debates can be prompted, as well as exercises related to the expression and argumentation of personal opinion.

The ethics of engineering can be considered as another topic of interest, since engineering students can find it relevant to their future professions. Nowadays, ethics in various professions is a frequently discussed topic. We are also witnessing debates regarding academic ethics in research, which includes students' activities, such as academic essays, various tasks, and graduation papers citation systems and references, in such a way as to not be accused of plagiarism. Translation ethics is a another topic which can be discussed with engineering students, as some of these students may prefer to translate their own work for various purposes, e.g. presentations within their companies regarding certain products, presentations of their academic research, workshops and trainings, correspondence with collaborators from all over the world, reports translations, and so on.

Work within projects and project management activities can also be included as didactic materials for engineering students. Nowadays, we witness the emergence of a project management culture, which can extend as far as the organization of certain companies is concerned. Engineering companies can be project-based in their organizational structure, and engineering students may benefit from materials



about project management culture, including notions such as project charters, business case, milestones, deadlines, and others.

2.2 Learning by Doing and Students' Engagement

Learning by doing [15] is clearly useful for devising learning materials for engineering students in foreign language learning. The practical approach included within the learning by doing principle can only stimulate the students' engagement in the activities created by the teacher. Once these activities are considered to be useful, due to their relevance to their future domain of activity, and demands they can encounter in their professional activity, students will be very motivated to solve them. It is believed that engineers are problem-solvers [16]. This can be a starting point for motivating engineering students to solve the exercises created for foreign language learning based on a problem-solving pattern. For example, students may be asked to consider solving grammar problems, e.g. related to the use of tenses in a technical text, together, by being divided into groups. Group activities can make activities more interesting, as they can consult with colleagues and also feel that they are in a safe environment, without so much pressure as in the case where they would be examined individually by the teacher. Such collaborative activities can encourage students to feel that they are both safe, in control, as well as willing to rely on their own opinions and understanding of the respective issues. They can feel that they are being encouraged to support their choice of solutions and also to consult their colleagues for alternative opinions, until they reach an agreement. The support of their peers can be encouraging as they are preparing an answer to present in front of their class and their other colleagues, as well as teacher.

The author of the present paper assumes that students enjoy collaborative activities since they are used to learning together with other colleagues for their exams, and explaining what they have understood to their colleagues, as well as to listen to their colleagues' explanations. As this state of affairs builds the basis for collaborative activities, further group activities can be used for foreign language learning, once teachers consider the fact that engineering students may need to be part of teams during projects in their professional lives. Projects are a usual way of collaborating in various domains nowadays, and they can be received from their companies as well as through European Union funding. Foreign language seminars can, therefore, be extremely useful to prepare students to be adapted to the real world.

In addition, considering scenarios related to job interviews can also be taken into account for the activities devised for foreign language classes. Students can be attracted to role-play, since they will clearly see the practical purpose of such exercises. They can understand how training for their own future jobs can be useful. They can easily collaborate with colleagues on such activities, once they are motivated to participate due to the clear relatedness to real-life situations that are included in such activities.

Problem solving activities can include the identification of the correct tense to be used in the context of engineering-related topics. To this purpose, a text based on engineering subjects such as an experiment or the explanations related to the way in which a gadget works can be relevant. A short text can be enough for students to identify the most frequently used tenses, such as present simple, past simple, when explaining various processes, together with conditional sentences when expressing hypotheses, as well as passive voice, which is found in academic texts and technical writing such as instruction manuals. The present simple value is that of a scientific law and process in engineering texts. Scientific truths are, in general, expressed through present simple tense, such as the following laws: "Water boils at 100 degrees," or "The earth is round." The process of building a house can also be described, step by step, by using the present simple tense. By applying the frame of engineering activities, the students studying in engineering faculties can gain a better view and understanding of otherwise abstract concepts in foreign languages, such as the use of tenses. Once they apply the theory of using tenses in the English language to their domain of engineering, students may have a much better understanding of this otherwise much too complicated grammatical issue. Therefore, their knowledge of general English can benefit from gaining further insight during their university studies, when their knowledge of a foreign language is directly applied to their professional domain of engineering.

3. Results

The practical application of theory is perfectly illustrated in teaching and learning foreign languages for specific purposes. Theoretical notions of grammar and vocabulary, as well as of various situations of



communications where we can find ourselves in, e.g. job interviews and creating our curriculum vitae or letter of intention, gain value once they can be put into practice. It is then when they change, from abstract notions into concrete ones, and when we gain further insight into both our knowledge of foreign languages and our knowledge of our professional activity domain, in this case, engineering. Foreign language learning finds its practical application to the domain of engineering. Once they finish high school, Romanian students are equipped with good knowledge of what is called general English. When they consider using it in their domain of engineering, then their foreign languages knowledge and skills acquire practical value. University foreign language seminars have the role of raising students' awareness of how they can apply their knowledge of foreign languages to their professional domain.

4. Discussion and Conclusions

It can be difficult for foreign languages teachers to move on from general English or other language to teaching foreign languages for specific purposes. This is because foreign languages teachers usually have a general foreign languages formation, as philologists. However, in order to teach foreign languages for engineers, teachers do not need to reach as far as to teach students heavy scientific language through completely specialized texts. Teachers can resort to popular science articles, general culture documentaries and texts, including knowledge from history regarding the beginnings of the field of engineering ever since ancient times. Ancient civilizations can be speculated regarding their early use of technology, as well as their surprisingly advanced level of the use of technology. The mysteries of extremely well-developed ancient civilizations technology-wise can be used to gain the students' interest in various texts, even if their purpose is only reading comprehension skills. History can, thus, very well be speculated in order to devise foreign language learning activities for engineering students. General engineering culture materials can be used to allow students to talk in a relaxed way during foreign languages classes. Otherwise, knowledge of specialized technical vocabulary can be developed once students know for sure their precise area of expertise and once they can rely on the use of dictionaries and glossaries. Foreign languages teachers can also allow engineering students to become encountered with specialized translation software, which may be of interest to them as future engineers, interested in the way various programmes work. They can also be made aware of the extent to which technology has become incorporated in the use of various professions, including translators' work, who collaborate with machine translation. Project management software can also gain their interest, and they may also become aware of how much software has taken over various roles in their own engineering field. The collaboration between human beings and machines, or software programmes, is by now a fact. Technological progress may become, for engineering students, a theme for reflection in itself.

Using topics that are relevant to the engineering students' future field of activity and to their own personal interests related to technology can help maintain their engagement. In turn, participating actively during class activities can help students assimilate the needed notions.

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