

# Helping Engineering Students Master the Use of Specialized Vocabulary when Designing and Delivering Presentations within the Domain of Their Specialization

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**Abstract** — The ability to deliver effective presentations in one's professional field is becoming a necessary requirement in many job positions related to the world of technologies and business. Future professionals will need to communicate arguments convincingly and spark genuine interest in audiences in order to achieve their goals. For these reasons, they have to master their communicative skills and constantly improve their linguistic resources, especially if they work in multinational companies. The aim of the article is to discuss the difficulties engineering students experience when they have to design and deliver presentations in English in the technical sphere. Through the methods of observation, data collection and analysis, it was established that students have problems when they need to use specialized vocabulary items and terminology in their talks. A possible solution to the problem is seen in the suggestion to implement tasks systematically oriented towards the content of the discipline, which can lead to an enhanced acquisition of specialized concepts by the students.

[http://www.ieee.org/documents/taxonomy\\_v101.pdf](http://www.ieee.org/documents/taxonomy_v101.pdf)

## I. INTRODUCTION

The dynamic realities of the globalizing world make individuals face challenges in relation to their professional and social lives on a daily basis. Positions in multinational companies require the possession of interpersonal and communicative skills, professional expertise and the ability to teamwork effectively in written and oral form with co-workers of various ethnic and cultural backgrounds. The present day employment market needs professionals who are able to efficiently perform in a quickly changing environment, keeping up with the newest developments in their own field of work.

In line with this trend, universities need to nurture students who will be ready to answer the requirements of their specific professional area as well as be fully-equipped to communicate their ideas successfully in a highly competitive professional world. In an international company where English could be the working language, they should be able to demonstrate a high level of their specialized professional skills as well as work collaboratively in teams, presenting ideas and practical solutions to problems in a clear and persuasive way. For these reasons, it is believed

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that a possession of efficient communicative and presentation skills in the working language is a necessary accomplishment of a technical graduate, both as a mandatory part of the ESP course of engineering students and as a valuable asset in their future professional lives.

## II. DISCUSSION

At the Technical University of Sofia, in their foreign language courses during the first and second academic year, which total in 120 hours, engineering students have to build up their linguistic resources, develop academic skills, acquire core technical vocabulary and master some basic genres for communication that will be necessary in their professional lives. This includes preparing and delivering of a presentation whose mark is part of the total mark they get at the end of the fourth semester. Students have the opportunity to work on acquiring academic skills, including presentation skills in English, and during seminars they can receive a peer and teacher feedback so as to fine tune certain aspects of the specific ways in which they can make their points convincing in front of different kinds of audience. The main goal is to make learners aware of their strengths and weaknesses and become motivated to work on them in order to improve their linguistic and communicative competences.

This paper is intended to give special importance to one of the key aspects specific to presentation, primarily in technical environment. It is related to using and successfully incorporating specialized vocabulary by students, such as technical concepts and terminology. The study is based on observations of the classroom activities of first and second year engineering students, concerning preparing and giving short talks and then presentations in front of peers on specific topics of technical matter of their choice. The observations were carried out on 25 students, separated into two groups for the period of two academic years – 2017-2018 and 2018-2019. There are a lot of aspects of their performance which need careful analysis and research, starting with the preliminary work of planning and preparation, then structuring the presentation and making the presentation slides, and finally, the delivery in front of the audience. Similar issues have been discussed in various publications by methodologists as in the sources [1]-[4], and there is a lot to be said on the topic. Students have multiple difficulties when they need to select the right linguistic resources and employ non-verbal means so as to express

their ideas and persuade the listeners without losing their interest till the end, leaving them satisfied with what they have learnt and feeling that their time has not been wasted. In the methodological literature dealing with the specificities of ESP, teaching presentation is seen as an event in which a person can make their case in front of an audience, using visuals and technological support. In reference [4], it is defined as „a stand-up, prepared talk accompanied by visuals”. This concept has also been given a very thorough analysis in source [3]. The author distinguishes between the business and academic presentation and treats the latter as „following the rhetorical traditions but at the same time they have been adopted to the process of university education which requires interdisciplinary preparation including different type of knowledge and skills (rhetoric, pedagogy, technical, semiotic, etc.)”[3]. In her opinion, presentation is a complex event which unites „verbal, visual and technological elements.”[3] So when we discuss a student’s presentation in class, we always give consideration to these elements, including features of non-verbal behavior and paying special attention to the way undergraduates include, use, and explain some specific terminology, characteristic to their topic or technical field. In reference [1], the author discusses some aspects of enhancement of the communicative competence of technical students and describes seven essential areas that have to do with the presentations in the technical sphere. He points out that students need to make technical information more attractive and understandable and illustrates it by giving examples from his classes.

This article aims at addressing a related issue – the incorporating and successful use of specialized vocabulary in presentations by technical students. Attention will be given to some of the main problems arising with the design of slides, the explanations of terminology students provide, and certain solutions will be suggested.

As it has already been said, at the Technical University students are expected to deliver a presentation in English related to their field of study at the end of the fourth semester and get a mark on their performance. It is a prepared talk, which includes employing needs analysis questionnaires, group discussions, peer assessment and teacher feedback as means to establish major issues that need to be addressed. Students normally share experiences about their previous presentations, watch educational videos emphasizing major stages of presentation preparation and delivery, and clarify aspects they have doubts about. Afterwards, the main steps of the presentation design and delivery are summed up and thoroughly practised using source [5], published by the Technical University of Sofia. Nevertheless, it is observed that students often struggle to deliver effective presentations, especially for their second year project. The study was conducted to address these issues with the intention to propose measures to help students master their communicative skills when they needed to clarify and defend a concept in front of an audience for a limited time (20 minutes). The problem became evident when it came to the explanation of specific terminology or a technical concept, used on a slide or prompted by a listener’s question. It turned out that very often students were unable to paraphrase a notion or explain it correctly, or just expected the rest of the audience to guess the meaning or simply knew it. On several occasions, they

showed a slide with complicated graphics, numbers or other technical details and believed that their colleagues would process it and then readily would listen on. As it could be expected, in such instances the audience became confused, lost interest, got distracted and stopped listening. At that point, they were reminded of the advice in source [6] that the visuals are just the support and tools in their talk, while the „essential relationship” is between them and the listeners. In other words, the visuals are not self-explanatory; they can grasp the audience’s attention and reinforce the main point. It is the speaker who provides the logical connection between the information on the slide and the key message of the talk, making it understandable, meaningful, and memorable to the listeners.

In the following slide (*Fig.1*), the student was unable to explain the similarities and differences between the two types of engines and just left the audience have a look at the slide for a while, and went on with the next issue.

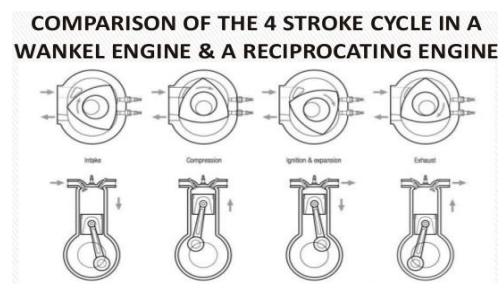


Fig. 1. An example of using graphics without accompanying clarification

Another instance of a mishap was when the text which was said by the presenter was written on the slide, which looked like a full page (*Fig. 2*), and then simply quickly read aloud, without any comment, or additional clarification, and again the vital explanation of the concept was missing, leaving the audience with a similar feeling of boredom and fatigue. The following slide was taken from the presentation titled „Tesla” by a student from TU-Sofia, delivered in 2018, and it is a good example of what has been mentioned above.

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**Born and raised in the Austrian Empire, Tesla received an advanced education in engineering and physics in the 1870s and gained practical experience in the early 1880s working in telephony and at Continental Edison in the new electric power industry. He emigrated in 1884 to the United States, where he would become a naturalized citizen. He worked for a short time at the Edison Machine Works in New York City before he struck out on his own. With the help of partners to finance and market his ideas, Tesla set up laboratories and companies in New York to develop a range of electrical and mechanical devices. His alternating current (AC) induction motor and related polyphase AC patents, licensed by Westinghouse Electric in 1888, earned him a considerable amount of money and became the cornerstone system which that company would eventually market.**

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Fig. 2. An instance when whole paragraphs are written on the slide instead of selecting only the key points to be developed by the speaker.

It must be said that 9 out of 25 students made this mistake, probably relying on the opportunity to read the information written on the slide instead of telling it to the audience in a more relaxed and attractive way. In the

discussion that followed, they agreed that a card reminding them some facts could be used while talking to the listeners, thus preventing them from losing eye contact, and at the same time helping them feel secure that they would not mix up facts. Of course, it was an excellent opportunity to stress the importance of practice before delivery. Some students even became aware that they should not cling too much to technology, but learn how to speak confidently and fluently in front of people, following the logic of their talk and establishing rapport with the audience, instead of learning everything by heart and reciting it fast, or quickly reading from the slide what they should be saying.

When students discussed that presentation, they pointed out the slide contained too much narrative information about Nicola Tesla's life and suggested rearranging it in a more acceptable for the presentation form manner, as in *figure 3*. Here are their tips on how to shorten it:

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**Nicola Tesla – Austrian citizen educated in engineering and physics in 1870s**  
**1880s – emigrated to the USA, set up labs and companies in New York,**  
**Developed the polyphase system**

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Fig. 3. A more concise version of the information in figure 2

Another idea that students have come up with is to make text-heavy slides more visual, often using a summing up sentence and a picture/graph that highlights the key point and makes it memorable. Shortening the slide's text will result in focusing students' attention only on the essential information or main concept. (*Fig. 4*)

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**Markthal (Rotterdam, Netherlands)**

**The artwork consists of vivid juncture of flora and fauna and it was done via 3D digital technology and it was among the first buildings to use 3D techniques. Some even like to call it “the modern Sistine Chapel”.**



Fig. 4. The original wordy message on the slide.

Students suggested revising the summing up sentences and proposed an improved version which was more compact. (*Figure 5*)

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**Done via 3D technology, the artwork called by some „the modern Sistine Chapel” was among the first buildings to use 3D techniques.**

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Fig. 5

Having in mind the mentioned instances, a logical question emerges: How can students be helped to become more flexible and precise when they need to make a point or explain a technical issue when presenting?

Related to the first part of the question, it can be assumed that they need intensive classroom practice to be able to speak fluently and logically, making up meaningful structures of their own without counting excessively on slides. As far as the second part goes, students need to have a good command of the item's use and meaning, acquired through multiple exercises in various forms and instances.

According to the researchers in source [7], when teaching specialized vocabulary, it is necessary to implement systematically practical tasks oriented towards the content of the discipline. They believe the quality oriented activities should prevail over the quantity oriented ones. In their opinion, the way of thinking, specific for the discipline and messages with specialized content are related to the characteristic elements of the discipline, which are presented through specialized concepts. The systematic acquisition of these concepts creates the learner base for communication; therefore the systematic teaching of specialized concepts is a premise for specialized concepts encounters, which in its turn promotes specialized knowledge building up and enhancing. The author of source [8] develops this idea and applies it in her study of the criteria development for the selection of specialized texts for students, stating that „the choice of vocabulary items to be taught should be oriented towards the importance of the concept as an information item and a cognitive element of the discipline.” She also holds the opinion that „the frequency of use is not the only criterion for the vocabulary item selection” [8] because of the relative rarity of specialized terms in texts. A good start can be made with the materials of reference [9], which provide a substantial introduction, explanation and practice of specialized vocabulary. This terminology can be additionally developed and recycled in the workbooks and tests at a later stage. In our case, after the initial encounter, students were asked to look for articles in websites and magazines, illustrating or enriching the knowledge about the subject matter, and present it in either a written form (a summary) or a short talk to their colleagues. Lists of technical vocabulary were made and in time new terminology was included in the glossaries with the most frequently searched specialized vocabulary items. At a later stage, the related vocabulary items were revised and recycled, and some gaps of knowledge were filled in.

### III. CONCLUSION

A conclusion may be drawn that students have to systematically experience multiple encounters of specialized concepts in activities, including reading, listening, speaking and writing tasks which require their use in a variety of instances. They also need extensive reading and listening practice as well as group work during which they are asked to apply critical reading skills, take notes, select material, distinguish between facts and opinions, paraphrase and synthesize information. The attractive TED talk videos have also been an excellent example of how to verbally and non-verbally convey the main message and communicate with the audience in an original way. But being limited in time, educators need to carefully select their materials and tailor them to students' needs. Thus, engaging them in a natural and beneficial way into deepening their knowledge in fields of their interest, positive results can be expected.

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