English at Croatian universities: luxury or necessity?

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Abstract:

This paper analyses the results of a survey among students of electrical engineering and computer science conducted at the University of Split, Croatia. In the survey, the students were also given an opportunity to self-evaluate their understanding of a scientific article they had read for the first time. The paper first gives an overview of the current situation at Croatian engineering colleges, showing their attitude towards the English language. Since colleges do not offer any systematic teaching to students after they have completed mandatory courses, we wanted to find out to what degree their knowledge allows them to cope with the challenges of the future education and professional life.

The aim was to simulate situations specific for their professional life. The four language skills were tested through various assignments. The results showed that the only way to improve their skills is through institutional teaching and learning, which raises the question whether Croatian colleges should reconsider their present attitude towards English in the light of globalisation and expectations of the labour market.

Keywords: engineering colleges, English, ESP, language skills, Bologna process

Foreign languages at Croatian engineering colleges are usually taught as courses in foreign language for special purposes (LSP), although there are certain colleges that offer their students courses in what we usually call "general foreign language". Any LSP is an aspect of that foreign language and is characterized by certain particularities that result from the functions it is supposed to perform in a certain field of study. In practice, students should acquire as many LSP features as possible in order to better cope with the demands of the labour market at which they will arrive after finishing their course of study. Since LSP is just part of "general foreign language", students not only acquire new LSP items, but also recycle their general vocabulary through various activities aimed at better communicative competence.

The year 2005 marked the official implementation of the Bologna Process. One of the Bologna process goals is to ensure greater mobility of students within their country of origin as well as abroad, which would mean, at least theoretically, that a student can start studying

electrical engineering in Split and finish it in Zagreb, Croatia, or in another country implementing the Bologna Process. In reality, things are not that simple, as curricula among related colleges within Croatia have not been harmonized yet. In order for a student to follow a course at a foreign university, s/he has to have a good general knowledge of the particular foreign language, LSP and foreign language for academic purposes – that is, have knowledge of the culture and civilization of the country and be familiar with academic discourse. Another goal of the Bologna Process is achieving independence in work and study. At present, however, students are often taught by methods that do not inspire any critical thinking. The informational content of courses is very often adapted for them, so they are not challenged by any goals to reach except to reproduce the content.

Foreign languages courses at engineering colleges are caught between the two extremes – either they have ceased to exist at all, even as elective or optional courses or they are taught through all six semesters of undergraduate studies.

The authors of this article are employed at the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture in Split as ESP lecturers. For this paper we collected the data regarding LSP courses at engineering colleges with similar curricula from their official web pages and compared them in order to find out to what extent foreign languages are taught in the first three years of undergraduate academic studies at state universities which are under the authority of the Ministry of science, education and sport. (L- lectures; E-language exercises per week)

University of Split FESB (Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture)												
Semester	1		2		3		4		5		6	
English	L	E	L	E	L	E	L	E	L	E	L	E
Electrical engineering and IT	2	0	2	0	2	0	/	/	/	/	/	/
Mechanical engineering	2	0	2	0	/	/	/	/	/	/	/	/
Naval architecture	2	0	2	0	/	/	/	/	/	/	/	/
Computing	2	0	2	0	/	/	/	/	/	/	/	/
Industrial engineering	2	0	2	0	/	/	/	/	/	/	/	/
University of Dubrovnik												
Semester	1		2		3		4		5		6	
English	L	E	L	E	L	E	L	E	L	E	L	E
Electrical engineering and computer science	2	2	2	2	/	/	/	/	/	/	/	/
Marine engineering	1	2	1	2	1	2	1	2	1	1	1	1
Marina and yacht management	2	2	2	1	1	2	1	2	1	2	1	2
Electrical engineering and communication technologies in shipping trade	2	1	2	1	2	1	2	1	/	/	/	/

University of Rijeka												
a. Faculty of Engineering (students choose between English and German, except in Computing where they have English only) b. Faculty of Maritime studies												
Semester	1		2		3		4		5		6	
	L	E	L	E	L	E	L	E	L	E	L	E
a) Electrical engineering	/	/	/	/	1	1	1	1	/	/	/	/
Mechanical engineering	/	/	/	/	1	1	1	1	/	/	/	/
Naval architecture	/	/	/	/	1	1	1	1	/	/	/	/
Computing	1	2	1	2	/	/	/	/	/	/	/	/
b) Marine engineering	1	2	1	2	1	2	1	2	1	1	1	1
Electronic and computer technologies in shipping trade	2	1	1	2	1	2	1	2	/	/	/	/

University of Zagreb												
a. Faculty of Electrical Engineering and Computing b. Faculty of Mechanical Engineering and Naval Architecture (semesters 1-2, English is optional; semesters 3-6, Technical English is taught)												
Semester	1		2		3		4		5		6	
English	L	E	L	E	L	E	L	E	L	E	L	E
a) Electrical engineering and IT	/	/	/	/	/	/	/	/	/	/	/	/
Computing	/	/	/	/	/	/	/	/	/	/	/	/
b) Mechanical engineering	1	1	1	1	1	1	1	1	1	1	1	1
Naval architecture	1	1	1	1	1	1	1	1	1	1	1	1

University of Osijek												
a. Faculty of Electrical Engineering (semesters 1-2, English is optional; semesters 4-6, English is mandatory) b. Faculty of Mechanical Engineering (semesters 1-2, courses in foreign languages are optional; semesters 3-6 Technical foreign language course is taught, and students choose among English, German, French and Russian)												
Semester	1		2		3		4		5		6	
	L	E	L	E	L	E	L	E	L	E	L	E
a) Electrical engineering	1	1	1	1	/	/	1	1	1	1	2	1
Computer science	1	1	1	1	/	/	1	1	1	1	2	1
b) Mechanical engineering	1	1	1	1	1	0	1	1	1	1	/	/

As we can see, the management boards of Croatian engineering colleges have disparate attitudes toward foreign languages, which are reflected in the number of classes per week. Some colleges have these courses for one semester or one year only, some for 2 years, some for all three. In the context of the Bologna process, labour market demands and constant need for scientific and professional improvement; we can say that attitudes that do not

advocate foreign languages courses lag behind contemporary social and educational trends: consequently, students as future engineers are left to their own devices when it comes to their LSP education (Borić 2005).

For the sake of comparison, we also checked the current status of foreign languages at Slovene universities. The data we collected from their official websites show that foreign languages are also to a great extent disregarded: at the University of Ljubljana students of electrical engineering are offered English for one semester only in their third or fourth year; students of mechanical engineering have English or German in their third year for one semester and students of computing in their second year. At the University of Maribor, students of electrical engineering, computing and telecommunications have technical English for one semester only in their first year (30 periods of lectures and 15 of language exercises), whereas students of media communications have English all three years for one semester (30 periods of lectures and 15 of language exercises).

Many students reach the intermediate level of English during their secondary education and at production and interpretation levels they are able to maintain conversation with native speakers and foreigners, or to read non-specialized printed media such as daily newspapers or weekly magazines. Still, the knowledge of English that students come with to university is usually insufficient for them to cope with the demands of their future professional life, and it often varies within the student population depending on their abilities, interest for studying and the quality of courses students were exposed to in high school. Exercises in oral production show fairly well the distribution of knowledge – if students are presented with a general English text that tackles a problem that they can in some way identify with, discussion will ensue, but active participants will be those students who are good and self-assured communicators. When it comes to answering questions related to a previously analyzed text treating some technical topic, students very often show lack of independence in their answers, either because they are not intrigued by the text and they have not read it once more so they are not able to give answers without referring to the text, or they have not mastered the skill of looking for, finding and presenting relevant answers without mentioning some redundant pieces of information just in case.

However, ESP at the tertiary level has its intricacies that high school students will remain unaware of if they are taught only from general English textbooks. After all, we, as professional lecturers, had to invest a lot of effort in order to master in the first place very specific terminology of engineering. For example, one of the specific features of technical English is multiword lexical units (MLUs) which have always been a problem not only for

translators, since good knowledge of technical content is crucial when translating them from or into English, but also for students who have difficulties in grasping their meaning and understanding the way the words are ordered and MLUs finally interpreted. Naturally, the more students are exposed to texts containing such units, the fewer mistakes they will make in their future professional life.

The fact is that not all students are equally competent in foreign language skills and that for some of them English presents a problem greater than any other course in their curriculum. Therefore, not only should the fear of foreign languages be dispelled but also a very firm conviction in some students that language equals grammar and that there is no use for a foreign language after they have been graded. Therefore, grammar should not be studied for its own sake, but should be perceived as a set of functions that can be applied in everyday life (Kennedy and Bolitho 1984). For example, if students are to participate in some student exchange programs, they will have to write an application and CV in English and they will be forced to use, along with everyday English, technical English at conferences or meetings, especially if they are given a task of making an oral presentation (Tokić 2004). Not only that: even during their studies they will have to use reference books, written very often only in English, or make use of information from internet websites also written in English in order to write a paper, a diploma essay or even a doctoral dissertation. In their education, it is critical that they master the skills of skimming and scanning text to find relevant information, that they observe and recognize relations among various pieces of information, such as cause and effect, contrast, comparison etc., and then they can read the text in detail if necessary. Taking notes and writing a coherent conference report as a follow-up is also a possible situation, as well as writing abstracts and summaries. Presentation of research results in English opens many doors to the world of science, but learning to write for academic purposes is a complex process which requires prolonged contact with scientific texts and a great deal of practice (Murray and Dingwall 1997, 4). The point is that if they are not competent enough to read, understand and use particular information, students/engineers will have to consult a language expert, which would mean that their education is seriously deficient.[1] Therefore, LSP syllabi at engineering colleges should help future engineers in day-to-day activities of their professional life since the potential number of situations where they will be required to

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[1] Some prominent universities in the USA organize writing courses in English for their students and staff whose mother tongue **is** English as writing for academic purposes is considered to be a skill for which high school education is far from sufficient. They are, therefore, trained particularly in critical writing and argumentation (Murray and Dingwall, 1997).

communicate in English can only increase, especially in academic circles where publishing papers and attending conferences are obligatory.

At the moment, we manage to reach some of the goals stated in the syllabus of *Engleski jezik* insofar as the current number of classes per week allows, and those are: reading authentic texts from the textbook English *in Electrical Engineering and Computing* (Štambuk 2005), finding key information in the text, translating, acquiring specific technical terminology and syntactic features of technical English. Two forty-five minute periods a week sometimes boil down to studying and revision of language features students should have acquired during secondary education and the time allotted is not sufficient to deal with some more complex features, which we have proven practically in our study. Written exams by which we test their knowledge of specific terminology and grammar are based on the same textbook, and they are followed by oral exam that consists of reading and translating texts they are familiar with and answering questions related to those texts. The current trend that favours written exams over oral ones has its drawback in that students do not have a chance to orally reproduce what they have learned and often they are upset at the very thought of having to talk in English, as they are not used to such kind of examination. This neglect of speaking may bring about serious difficulties for some future engineers if they are one day asked to present a project they have been working on to their audience and convince them of its feasibility, be that presentation in English or their mother tongue.

Our study, conducted at the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture in Split during the first and second semester of academic year 2007/2008, consisted of two parts. The participants of the first part of the study were first year electrical engineering and computing students and the participants of the second part were 135 pre-Bologna students and 286 first-year Bologna students.

The students participating in the first part of the study were divided into two groups, electrical engineering students and computing students. The number of participants varied because of irregular attendance, so the average number of participants amounted to 30.77. The questionnaires, as the second part of the study, were distributed to 135 participants during their final semester and 286 participants in their first semester.

The aim of this study was on the one hand to estimate to what degree the students' skills meet the specific requirements in their further academic training, and on the other to find out how the students feel about the necessity of formal English instruction. The study aimed at assessing the four language skills: writing, reading, speaking and listening in real-life situations.

The aim of the first two assignments was to estimate whether the students acquired the efficient strategy of reading with the goal of understanding and finding relevant technical information with special emphasis on accuracy. The emphasis was placed on the text and its characteristic features, to finding key words as well as to text cohesion and coherence. In the first and second assignment, students were given an unfamiliar scientific paper in English, recommended by teachers of vocational subjects. After having read the paper, students were asked to express their attitudes about its content and they had to write summaries. Through their lessons, students were taught about the importance of mastering the writing skill, learning about the difference between an informative and descriptive summaries including agreed upon number of words.

The third task aimed at assessing the students' speaking skills. While teaching, the lecturers noticed that forming morpho-syntactically and semantically well-formed questions is an extremely difficult task for many students. Students were given a gapped scientific text and they had to form questions in order to find the relevant missing information.

The fourth task aimed at practising active listening. The students listened to an interview taken from a course book, *Oxford English for Information Technology*, intermediate level, which aims at all round skill development. While listening to the recording actively, students took standard notes and were asked to write a report afterwards. They were given a limited time to write the report.

While reading the summaries and the reports, we faced the problem of authentic evaluation. We agreed to distinguish two levels of analysis where the weaknesses appeared. The first level was a morpho-syntactic and semantic level and the other was the discourse analysis level. The first two assignments were not conducted in strictly controlled conditions, therefore objectivity could not be guaranteed, even though tendencies were observed. Unfortunately, the results obtained by assessing the summaries, taking into consideration both levels of analysis, could not be completely precise and could hardly be expressed in numbers. Despite the instructions, students tended to copy parts of the text either from their peers or from the text. Still, certain regularities in occurrence of mistakes could be observed. The above-mentioned problem of insufficient awareness of individual approach to problem solving is one of the key issues that need to be overcome, since the fundamental aims of the Bologna process is shifting the emphasis from teaching to individual approach. This problem of insufficient emphasis on individual approach was not the case in report writing where the time was limited and no possibility of copying existed. Students wrote the report according to the notes they were taking while listening.

The number of students having difficulties on both levels of analysis is displayed in Tables 1 and 2.

Table 1: Mistakes on syntactico-semantic level

Mistakes on syntactico-semantic level	Computing students (number of students: 26)	Electrical engineering students (number of students: 70)
Articles	22 (84.61%)	53 (75.71%)
Prepositions	15 (57.69%)	44 (62.86%)
Wrong verbal tenses	20 (76.92%)	47 (67.14%)
Singular/plural of verbs/nouns	6 (23.07%)	27 (38.57%)
Wrong choice of words	7 (26.92%)	21 (30.00%)
General/technical vocabulary	/	/
Punctuation	N/A	N/A
Spelling	19 (73.07%)	43 (61.43%)
Wrong choice of relative pronouns	/	8 (11.43%)
Syntactically awkward structures	9 (34.61%)	26 (37.14%)
Modal verb+to	/	7 (10.00%)
It's/its; he's/his	/	5 (7.14%)
Like *instead of* as	/	6 (8.57%)
Active/passive (personal vs. impersonal)	/	4 (5.71%)
Pronouns without their referent	2 (7.69%)	6 (8.57%)
Adverb instead of adjective	/	/

Table 2: Mistakes on discourse level

Mistakes on discourse level	Computing students (number of students: 26)	Electrical engineering students (number of students: 70)
Cohesion missing	8 (30.76%)	32 (45.71%)
Wrong information	7 (26.92%)	30 (42.86%)
Unclear/incoherent utterances	2 (7.69%)	14 (20.00%)
Elements of spoken language	7 (26.92%)	11 (15.71%)
Unnecessary information/repetition	5 (19.23%)	15 (21.43%)
Surplus of words	/	27 (38.57%)
Unconnected information	/	29 (41.43%)
Insufficient number of words	/	21 (30.00%)
Insufficiently informative	2 (7.69%)	22 (31.43%)
Subjective information the author cannot corroborate or verify	/	/
Parts of text copied	/	/

Despite having a passive knowledge of how to write a summary for a final paper, as one of the real-life situations in the future, students were not capable of managing it at this stage. Students tended to use active constructions far more often than passive ones and the wrong use of tenses as well as forming tenses was a key issue. Learned structures were still not acquired properly and further emphasis should be paid on systematic developing of proper and coherent writing. The most frequent errors which appeared at this first level were caused by insufficient high school knowledge. On the scale of frequency, the most troublesome points were related to the use of articles, wrong choice of prepositions, incorrect usage and structure of verbal tenses, the singular and the plural of verbs and nouns, wrong choice of words, and syntactically awkward structures. The second type of mistakes was associated with insufficiently acquired contents that were taught in the first and second semester. Students learned about the distinction between general and scientific language but did not use it when needed (Table 2). The observed weaknesses at the discourse level could be classified as missing cohesion, the use of unclear utterances, unnecessary information, surplus of words, unconnected information, insufficient number of words, and insufficiently informative. The summaries were usually not coherent and concise; they did not follow the chronology of the article, provided no logical connections between sentences, students often used the first and second person, which is not typical for technical writing. Students also put results expressed in numbers into the summaries and the overall general tone was not technical and scientific, often having too many elements of spoken language.

We observed that the students of computing had a better pre-knowledge of general language. These students tended to have fewer difficulties in fulfilling the requirements of the task, showing more independence compared to students of electrical engineering. In favour of this speaks the fact that 87.5% of the computing students graduated from grammar school compared to electrical engineering students where only 47.56% graduated from grammar school. Grammar schools have three to four hours of formal English instruction per week, whereas vocational technical schools have only two hours.

When asked whether they could retell the scientific paper after reading it, 93.75 % of the computing students thought they could, whereas only 48.78% of the electrical engineering students expressed the same. 43.75% of the students of computing thought they understood most of the text, whereas only 24.39% of the students of electrical engineering shared that opinion (Table 3).

Table 3: Questionnaire

Group 1 (32 computing students)

After reading the text they thought they understood it:	*- completely*	2 (6.25%)
	- most of it	14 (43.75%)
	- partially	16 (50.00%)
	- they did not understand it	0 (0.00%)
After reading the text they thought they:	*- could retell it*	30 (93.75%)
	- could not retell it	2 (6.25%)

Group 2 (82 electrical engineering students)

After reading the text they thought they understood it:	*- completely*	0 (0.00%)
	- most of it	20 (24.39%)
	- partially	56 (68.30%)
	- they did not understand it	6 (7.32%)
After reading the text they thought they:	*- could retell it*	40 (48.78%)
	- could not retell it	42 (51.22%)

The information-gap exercise showed the same results. Students had to form five questions. 28% of the computing students formed all five questions correctly, 24% formed four questions correctly whereas 7.14% of the electrical engineering students formed five questions correctly and 3.57% formed four questions correctly (Table 4).

Table 4: One speaking exercise – information gap exercise

Group/Number of correct questions	0	1	2	3	4	5
Group 1 (25 students of computing)	1 (4.00%)	1 (4.00%)	4 (16.00%)	6 (24.00%)	6 (24.00%)	7 (28.00%)
Group 2 (56 students of electrical engineering)	16 (28.57%)	14 (25.00%)	12 (21.43%)	8 (14.29%)	2 (3.57%)	4 (7.14%)

Even though the students of computing showed better results, it must be said that even such knowledge is insufficient to cope successfully with all the demands of the European labour and scientific market.

The second part of the research, which was to find out their subjective attitude towards English-language learning, was conducted among 135 pre-Bologna students, who were about to finish university education very soon, and 286 first-year students at the Faculty of

Electrical engineering, Mechanical engineering and Naval architecture. The survey was conducted in the first and second semester of the academic year 2007/08.

As to the pre-Bologna students, 68% of them agree about the necessity of introducing a subject entitled Communication skills in the English language, a continuation of the English course with expanded objectives. Besides having a good knowledge of the scientific English, the students feel that their English classes were welcome but insufficient to cover all the areas where the language accompanied with excellent communication skills will be essential for business success. Moreover, 72.5% of the students think that universities do not pay enough attention to continual and systematic teaching of English and 46% think that their present knowledge of English (both general and technical) is not sufficient for the demands of their future business life in the globalized world.

The first-year students (75.17%) would like to learn English at university even if it was not an obligatory course, and 75.52% said that they understood the difference between general and technical English. When asked about their expectations regarding the syllabus of *Engleski jezik,* 82.86% answered that they expect to learn technical vocabulary, 43% think that they will practice mostly spoken language. On the other hand, only 18.53% expect that the course would concentrate on translation practice. Contrary to the widespread belief that "everybody knows English" and that young people, being technologically oriented, have no problems with reading specialized magazines in English and browsing the Web in search for information, 47.9% said that they experienced some difficulties due to their insufficient knowledge of English.

Since the Bologna process envisages a greater mobility and emphasis on self-education, the attitude towards English language teaching at university should be changed.

> In view of the fact that the question of languages is of such crucial importance for European integration in general and for the creation of a European higher education area in particular, the European Language Council calls upon the authorities, institutions and organisations carrying forward the Bologna Process to put the question of languages on their agenda.(CEL/ELC 2002)

The fundamental goal of the English course would be to efficiently help students and future experts to take part in international meetings through systematic teaching and acquiring excellent speaking and writing competence in general and scientific language. This speaks in favour of some European initiatives and the Bologna process where the emphasis is given to higher mobility of young experts, who are expected to promote themselves as well as the Croatian science and culture: "If higher education degrees are to be relevant to the European

labour market, graduates have to be able to communicate in a number of languages...."
(CEL/ELC 2002).

University curricula do not always keep abreast with current trends in the world of technical sciences, so that there is a gap between proclaimed concern for thorough and systematic education and reality in which there is less time dedicated to English. The demand for engineers and scientists fluent in English has risen in the last decade or so. On the other hand, we as teachers are faced with fewer English classes during which we are supposed to teach and prepare students for their future scientific and professional life and improve their basic language skills, which are often deficient. The problem that yet has to be solved is how to tailor a foreign language course that would meet specific needs of students in so little time that we have at our disposal and maximize learning. Our research shows that the level of knowledge is inadequate for the demands that may be required in the future, and two or three semesters of English cannot cover all these aspects successfully. Both teachers and students feel that an expanded course, which would concentrate on specific needs, would be welcome. Therefore, the authors recommend the introduction of a new course as a continuation of the current English course.

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