

DEVELOPMENT OF ENGINEERING STUDENT SKILLS AND COMPETENCES THROUGH PARTICIPATION AT INTERNATIONAL SCIENTIFIC CONFERENCES

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Abstract. The present article dwells on the skills and competences of students described in the learning outcomes of the study course “Professional English” and on the possibilities that are offered by participation at international student conferences to improve the skills of students for them to be able to succeed passing the examination in the study course “Professional English”, enter the Master studies after the graduation from the university or be successful in their professional activities. Already for seven years an international scientific conference for undergraduate, graduate and post-graduate students, called “Students on their Way to Science”, is being organized at the Latvia University of Agriculture by the Faculty of Engineering in co-operation with the Faculty of Social Sciences and the Forest Faculty. The results of the interview with the students of the Faculty of Engineering who have participated at this conference and their opinions are described and analysed.

Keywords: engineering student skills, international conferences, development.

Introduction

Expansion of globalisation and internationalisation and due to it the dynamic changes in society create new requirements for the young specialists to be able to be competitive in the international market. Higher educational establishments should organise the process of studies in the way that the skills and competences of the graduates are in compliance with these requirements.

Due to the new system of quality assessment in Latvia all study programs and study courses are being revised, developed and supplemented. Learning outcomes, including the description of knowledge, skills and competences, were elaborated also for the study course “Professional English” that is taught at the Faculty of Engineering to the first year students. In order to achieve the learning outcomes determined in the course program it is necessary to search for application of different teaching/learning methods as the planned amount of the credit points and contact hours is too small to manage to train the described skills and competences adequately in the classroom. Therefore, the teachers are involving the students in different extra-curriculum activities that could help in the development of the necessary skills and competences. One of such activities is student international conferences that, according to the opinion of the author of the article, are excellent means for development of student competences, including foreign language skills and cross-cultural communication competences outside the classroom.

Materials and methods

The following methods and materials are used in the research: interview, collection and analysis of the materials related to development of student skills, including foreign language and cross-cultural communication competences, reflection of personal experience and international scientific student conferences as means of development of the mentioned skills and competences.

In 2012 in Latvia within the frame of the Project for evaluation of study programme quality, overlapping, sufficiency of resources and sustainability [1] the quality of all study directions and programs at higher educational establishments will be assessed. For evaluation of the study programs the following groups of criteria are used in the project:

1. for evaluation of quality;
2. for evaluation of sufficiency of resources;
3. for evaluation of sustainability;
4. for evaluation of overlapping.

One of the criteria in these groups is: The students are involved in scientific research (creative) work, the topics of these research works are related to the study aims and the expected study results, the students are involved in national and international research and creative (art) projects. (The number of publications by students). The scientific research is an organic part of program implementation. (Student publications). [1].

Fulfilment of this criterion is directly related to student participation at international scientific conferences and publishing of their research results. It also clearly demonstrates the quality of the achieved results of students during the process of studies, gives feedback of their success to them themselves as well as to the teachers. This feedback is very important for planning activities in future in the process of studies.

Other evaluation criteria used in the project related to the present research include:

- exams, projects, and other evaluation methods are capable of evaluation of the level of study results attainment reached by the students;
- individual approach is employed;
- students are prepared for further qualification improvement and personality development;
- co-operation with other education and research institutions, international organizations;
- opportunities to perform research jointly with the students and academic staff of other Latvian and European Union study programs (AII) are provided and used [1].

Also these criteria pronounce and include the necessity to organize student international conferences and to encourage the students to participate at them with their contributions - presentations and publication of their research materials. Student international conferences help ensuring of all the mentioned requirements what is not always possible to achieve during the sessions in the process of studies.

According to the quality assessment requirements the course programs have to be revised and supplemented by the description of the learning outcomes - knowledge, skills and competences. The learning outcomes described in the course program "Professional English" for the students of the Faculty of Engineering at the Latvia University of Agriculture were prepared by the teachers of English at the faculty Aija Pētersone, Anete Mežote and Larisa Maļinovska. They are as follows:

After completing the course the students will have:

- **knowledge** – terminology of automobile transport, agricultural machinery and mechanization of animal husbandry, professional information in the English language; the knowledge of the language use in the professional area;
- **skills** – students are able to apply the knowledge and communicative skills, including reading, speaking, listening and writing skills, in their professional activities, participating in discussions, creating dialogues, making presentations. Students are able to use professional terminology in various communicative situations (telephone talks, job interviews, business correspondence, electronic documents, etc.). They are able to find the necessary information in a foreign language on-line, work with dictionaries of terminology and industry;
- **competences** – students have improved the competence of professional foreign language in order to apply a foreign language creatively in spoken and written communication for professional activities, student mobility and in academic environment [2].

The amount of the knowledge and skills to be acquired by the students as described in the learning outcomes is quite large. At the same time the number of the credit points and foreign language sessions in the study year is too small to cover the themes, train the skills and competences mentioned in the learning outcomes. The students have to work independently and take responsibility for their own learning. Students need to understand that they are in control of their own efforts to learn the material [3]. It is much more motivating for the students if they have a definite aim and the teachers can apply different methods to involve the students in independent work for reaching the aims that are set together. Several methods and extra-curriculum activities can be used to reach these aims, but, according to the opinion of the author, international scientific conferences are the most efficient means for motivating students to learn, develop their skills and competences and work independently to achieve the aims.

In the Commission Communication to the European Parliament and the Council of September 16, 2011 it was stressed that today there is an ever increasing need to ensure mobility possibilities and multi-cultural skills [4]. It relates also to the students of our university as well as to the graduates when they have started their professional activities. It is clear that professional skills alone cannot ensure promotion in work. Interpersonal, cross-cultural communication competences and foreign language

skills are not less significant. With the continuing globalisation of markets and internationalisation of trade, professionals from a wide range of organisations, from large multinational corporations to small and medium size enterprises, are increasingly coming together to do business in the international workplace, particularly in meetings. Such international events usually bring together people from different linguistic and socio-cultural backgrounds with the result that a common language of communication is frequently adopted. More often than not this lingua franca is English. While English for International Business (EIB) has an essential function as a lingua franca in multilingual settings, it can also present challenges both linguistically and culturally, particularly as more and more interactions are between speakers whose first language is not English [5].

Smart and successful entrepreneurs try to enlarge their business on international level and they realize today that searching for international partners great attention should be paid to cross-cultural communication, therefore, they should be aware of cultural differences they may encounter in their business deals. Cultural differences determine many important factors that are related to business and professional life of people. Successful cross-cultural communication is a prerequisite for successful business relations.

The future specialists should be ready to understand their peers and react accordingly in compliance with the given situation. They should also have be able to form external relationships that help firms strengthen and extend their traditional competences while responding to the demands of globalization, mass customization, enhanced quality and rapid technological change. The 21st century is characterized by ever growing amount of information and technical up-dating that influence mobility, dynamics and constructivism of people. Exchange of information does not take place only in one country but large co-operation develops in the spheres of economics, culture, education, science and politics. The society needs specialists able to adapt to the fast changing requirements, take challenges and be competitive [6].

While the students are studying at the university they should start training their competences to be successful in their workplaces after graduation. Already being students of the university they have to get a test in the study course “Professional English” in the first semester, to pass the examination after the first year of studies and be ready for studies in the Master course after getting the Bachelor’s degree. International student conferences are means for implementation of these tasks.

In 2012, already the 7th international scientific conference for undergraduate, graduate and postgraduate students “Students on their Way to Science” is organized in co-operation with three faculties of the Latvia University of Agriculture – the Faculty of Engineering, the Faculty of Social Sciences, and the Forest Faculty. Last year there were 149 participants present from 13 countries – Latvia, Lithuania, France, Germany, Russia, Belarus, Slovakia, Czech Republic, Bulgaria, Greece, Ukraine, the USA and Ireland. The conference is aimed at dissemination of scientific research results, sharing of experience, improvement of foreign language and cross-cultural communication skills, and establishing of international contacts [7]. Student conferences help enhance the knowledge of students, share their ideas and information on theoretical issues in different spheres as the contributors represent different fields of study. The only possible way to communicate for the contributors among themselves obviously is in a foreign language as they are representing different countries having different languages and being carriers of different cultures. The working languages of the conference are English, French, German and Russian. Nevertheless, there are reports mainly in English with some exceptions in the other mentioned languages. It gives an opportunity to analyze the competences of the English language that are acquired and mastered at such international conferences communicating cross-culturally. As there are representatives of so many countries present at the conference it is possible to conclude that the students participating at it will surely train also their cross-cultural communication skills in communication among each other using the English language. So, both of these competences are closely interrelated and trained together.

Results and discussion

In the revised course program “Professional English” there is a new provision included that the students who are participating at an international scientific conference with a presentation and publication do not take the examination, their grade evaluates the above mentioned work – the quality

of it. The author is of an opinion that it is a very good practice for the first year students. Sometimes they are afraid to speak in a foreign language in front of so many people among whom there can be also native English speakers. The teacher should manage to encourage them. Once they have done it, they become more convinced in their abilities and their self-assessment grows. It is one of the pre-requisites for motivation to learn and further success.

The preparation time for the conference is very important as during it the students are reading a lot in foreign languages to find the necessary materials and information. They need not only to collect the materials but also to select the important ones, process the information and at the end prepare the presentation and publication. It is not so easy as usually there is a time limit for speaking in sections, limits and other regulations for the publication. The students must acquire the theme completely to be able to meet these limiting requirements. What is not less important, they should take the responsibility for their own learning that is one of the main aims of the teachers to be achieved by the students during the process of studies. After successful participation at a conference the students have an opportunity to see how they have progressed towards their aims and they can assess their own contributions in comparison to other student achievements. Also the teachers get the same kind of feedback about the student performance results. It should be mentioned that participation at international scientific conferences requires application of all four foreign language skills to be trained – reading, writing, speaking and listening. Such conferences are interdisciplinary in their nature, conference activities in the university environment are seen as a means to support the teaching-and-learning process by opening the possibility for undergraduate, graduate and post-graduate students to make their contribution to the spheres of innovation, as well as to socialize on the basis of their research in different sciences and humanities. As such, they are seen as a popular means of supporting interdisciplinary ties in the university programs, different fields of knowledge and various methods of research being involved [8].

Conferences help publicise the higher educational establishments, the faculties the students and their advisers are representing and the study programs at these faculties. They promote interdisciplinary links, co-operation among faculties and higher schools as well as among different countries. The conference brings together students, teachers and researchers, and develops skills for employment [9]. Speaking about the advantages of international student conferences in different sources of literature student accountability is mentioned again and again by educators as a plus for such conferences. Another plus is the way even a struggling student can produce something positive for a conference [3].

For these weaker students the teacher's help will be needed, the students can train presenting their reports in the classroom during the English sessions where the group mates and the teacher can ask questions, discuss and express their comments. It helps form the readiness for presenting the material at the conference and be ready also for answering questions and discussions with other contributors afterwards as conferences are scenes where students can present not only their research materials and results but also discuss their opinions and views on different issues they are interested in and they have researched. The author is of an opinion that the students whose self-assessment, teacher's assessment and peer assessment is higher can do much to help the weaker ones in making their performance better and encouraging them to participate actively not only in the English sessions but also in extra-curriculum activities, like student international conferences that are analysed in the present case.

Last year 42 undergraduate students from the Faculty of Engineering participated at the conference with their reports, 13 undergraduate students from the faculty prepared also publications. It is quite a big number and it shows that the students of the faculty are active, motivated and willing to improve their foreign language skills. They were interviewed by the author of the article asking several questions to get to know their opinion on the possibility to improve their foreign language skills and cross-cultural communication competences through participation at the conference. Fifteen respondents participated in the interview. The respondents were chosen considering their interest in participation in the interview. It should be mentioned that the students of the Faculty of Engineering are always very responsive and willing to help. Their answers are summarized below.

To the interview question: Why did you decide to participate at the conference? - the students mentioned the following reasons – to prove to themselves that they are able to do it and demonstrate their abilities, to master the foreign language skills, to get acquainted and communicate with students

from other countries, to popularize their research results and to get to know more information about the theme they are investigating listening to the presentations of other contributors.

If the students are convinced of their abilities and are ambitious, it helps in improving of their self-assessment what is a prerequisite for success in student performance in studies and motivation to learn. Communication with foreign students improves not only cross-cultural communication skills but also foreign language skills of students. Presenting of the student research results helps in exchange of information among the students who are doing research in the same or similar fields, they can supplement each other with their research results and achievements, discuss problems related to their research issues. During preparation for the conference the students have to read a lot not only in Latvian but also in foreign languages to find the necessary materials for their publications and presentations. It enlarges their knowledge in the researched theme and gives an insight in what results have already been attained by scientists all over the world in relation to their investigations. At the same time reading and writing in English improves their English language competences.

The next question asked to the students who participated at the conference was: What were the main gains and benefits from participation at the conference?

The answers mainly coincided with the answers to the first question only the ranking of their importance was different. As the main benefit acquisition of new knowledge was mentioned and development of the English language skills followed. The students mentioned also that it had been a good practice to speak before a large audience and it helped learning how to overcome stress and fear. They mentioned also that they had learned how to make a good presentation, getting acquainted with students from other countries and higher educational establishments in Latvia. Some of the respondents mentioned a possibility to popularize their university and faculty, to learn more about the research results of other students and just being together with peers.

Analysing these answers we can make a conclusion that the aims the students had for participation at the conference were achieved. After such conferences usually the students get involved also in Erasmus programs visiting the countries the students of which they had met at the conference and got acquainted with. Cross-cultural communication with students from foreign countries is a good stimulus and motivator for student exchange. For instance, several students from the Faculty of Engineering have participated at Erasmus exchange programs at the Czech University of Life Sciences in Prague after getting acquainted with the students and teachers from the mentioned university who have participated at conferences at the Faculty of Engineering at the Latvia University of Agriculture before.

The third question in the interview was: Are you satisfied with your contribution and performance at the conference, will you participate at the conference in future?

All of the respondents answered positively. Still, some of them had understood that they should improve their English language skills, get deeper into their research and learn more about different cultures to be able to communicate more successfully with students representing different countries and cultures with different from ours traditions and habits. Realisation of these drawbacks by the students motivates them for further studies and acquisition of new knowledge in these spheres for being more successful in future.

As the conference "Students on their Way to science" is organized already for the seventh year, looking through the lists of participants we can see that if once a student has participated, he/she often participates repeatedly. As in the conference "Students on their Way to Science" there are separate sections for undergraduate, graduate and post-graduate students, the scientific level will be different in these sections. The first year students cannot present deep research results in comparison to Master and Doctoral level students, still their participation should be promoted by the teachers. First of all, it is a way how to stimulate the students for future success. Secondly, they master their foreign language skills – reading and writing - during preparation for the conference reading related materials and preparing the publication and presentation, they improve their presentation and speaking skills at the conference and their conversation and cross-cultural communication skills at the conference and after it communicating with foreign students and teachers. It helps also in overcoming stress of speaking in a foreign language in front of many people, deepens their knowledge in their chosen themes and prepares for professional activities after graduation from the university as all the mentioned skills and

competences will be of great help for the young specialists in their professional as well as in everyday life. The experience that the students have got at the conference will be of great importance also in their professional career.

Conclusions

1. Today's society needs specialists who are competent not only in their professional fields but who are able to adapt to the fast changing global requirements and be competitive in the local and international market.
2. According to the requirements of the new system of quality assessment the study programs are supplemented with descriptions of the learning outcomes: knowledge, skills and competences. The learning outcomes were elaborated also for the study course "Professional English" taught at the Faculty of Engineering.
3. To achieve the learning outcomes successfully new teaching/learning methods should be searched for and introduced in the process of studies at the university, including extra-curriculum activities, for instance, student international scientific conferences.
4. Student international conferences help enhance the knowledge of students and develop the skills and competences necessary for successful studies at the university and professional career after graduation.
5. Student international conferences are means of development of foreign language and cross-cultural communication skills of students, promotion of international contacts for Erasmus exchange programs and other international activities and motivation for deeper studies.
6. Student international conferences help students work independently and take responsibility for their own learning what is one of the most important aims to be achieved in the process of studies at the university.
7. Interviews with the students who have participated at international conferences show that the students are satisfied with their achievements and they have got feedback on what they should master in future. The feedback is important also for the teachers as it helps planning future activities more successfully. Joint work of students and teachers ensures better student performance in the English sessions as well as in extra-curriculum activities.

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