IMPLEMENTATION OF THE TEMPUS ECDEAST PROJECT AT BAUMAN MOSCOW STATE TECHNICAL UNIVERSITY

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ABSTRACT

This paper shares experience gained during implementation of an ECDEAST Tempus project at Bauman Moscow State Technical University. Topics covered here relate to management of the project only. Particularly, an added value to the education in the university is described. A specific attention is paid to the problems that were faced at the University when implementing the project, such as lack of interconnections with employers. Recommendations are given for further enhancement of projects realization.

INTRODUCTION

Since 2010 at Bauman Moscow State Technical University a TEMPUS project «Engineering Curricula Design aligned with EQF and EUR-ACE Standards» (ECDEAST) is being implemented at the department of refrigerating, cryogenics and life support systems.

The ECDEAST project objective is to ensure that Russian universities have advanced curricula for programmes in line with new development in the chosen engineering

areas and according to the Bologna Process (EQF) and European standards for the quality of engineering education (EUR-ACE).

Particularly, following aims have been achieved:

- Development of a methodology for engineering curriculum design based on the alignment of EQF & EUR-ACE Standards with Federal educational standards requirements to structure of programmes and graduates' competencies.
- Training of the university staff to design engineering curricula according to EUR-ACE requirements with using of ECTS.
- Development of a master engineering programme and course modules materials at BMSTU and partner universities according to EUR-ACE requirements with using of ECTS and Dublin Descriptors.
- Accreditation of the developed programme with awarding of the EUR-ACE label.

The main project outputs are:

- Guidelines on engineering programme design;
- New curricula of 3 engineering programmes at TPU, BMSTU and SPbSPU (one in each);
- Updated syllabi and teaching materials of courses and modules with ECTS credits allocated to learning outcomes;
- Trained faculty of TPU, BMSTU and SPbSPU for curriculum design;
- Experience gained through teacher exchange, then shared;
- New programmes implemented at TPU, BMSTU and SPbSPU (one in each);
- Programmes evaluated by peers against EUR-ACE Standards;
- Informative project website, promotional materials disseminated;
- Book on engineering curriculum design.

This project was very successful and brought a high added value to the education at BMSTU. It includes academic affect, affect on policy, affect on staff, affect on R&D at the university. First one considers development of a new master programme, design of new teaching methods, implementation of new assessment methods. All these have been realized within a novel for Russia Dublin descriptors, Tuning methodology and ECTS credits. Affect on policy includes distribution of didactic materials and learning outcomes, creation of didactic laboratory. Affect on staff considers retraining of senior teachers, young lecturers and supporting staff. R&D has improved a lot by creation of new laboratories and enhancing of internal teachers mobility.

PROBLEMS AND TROUBLES

However, some problems have been faced at the stage of implementation of the project.

It is important for master programmes to be designed oriented for a scientific research, rather than traditional for Russian education system design and construction of some technical devices. This includes teaching of various skills such as collection, analysis and usage of large volumes of information and decision-making.

In order to implement this major component, it is necessary to perform large volumes of the researches in the university and introduce the obtained results in businesses.

Very often in order to perform precise experiments Russian universities have lack of good equipment. This relates mostly to modern high-end analytical laboratories and techniques, as long as there is still available very special equipment that may be used for unique experiments.

High-qualified employees are of high demand not only at universities as lecturers, but also at scientific companies, and businesses in all areas especially SME. However, we faced some difficulties in contacting large enterprises and small and medium businesses. The university has traditionally good relationship with state organizations and research institutes, but they expect engineers of original "Specialist" education system as their employees. This happens due to following reasons:

- Employers are poorly informed on the changes that have been made in the education system in the last ten years, they don't know the tasks that could be solved by a B. Sc and M. Sc specialists in real industrial applications.
- At the same time, university prepares specialists mainly for these large state enterprises, although there are many SMEs. Graduates often do not have skills and knowledge required to work in smaller businesses.
- Employers do not interfere much in the process of education. Very often they do not pay any attention to the master programmes and consider that they will retrain graduates after they will start to work in these companies.

Besides, quite often the employers do not understand well the situation in the higher education system in Russia. They prefer to employ graduates with the traditional "specialist" diploma, as they do not realize all the benefits that are brought with the "master" diploma. However, we believe, that in the nearest future this will change. Russia has transferred to the two-tier education system for most of the teaching topics according to Bologna process. This will result in the fact that very soon Master students will be of high interest of the employers as they will represent high level of education, deep knowledge and perfect skills.

Another issue faced during the implementation of the project was introduction of the ECTS credits and modules in the programmes.

Traditionally quality of education in Russia was measured with the amount of teaching hours delivered. After introduction of the credit system this situation had to be changed. Therefore Russian state federal standards of the 3rd generation considered one credit to be equal to 36 academic hours. So, they connected duration of education with the amount of credits obtained, rather than connecting learning outcomes with the credits. This, on the one hand, results in serious problems when trying to tune Russian master programmes to be in line with the European ones. On the other hand, many Russian programme developers still do not understand how learning outcomes may be measured quantitavely.

Same may be applied to the term of "module". Most of the programme developers do not know what one module should include in it. Should one module be interdisciplinary or it should cover only one subject.

RESULTS AND RECOMMENDATIONS

Overall, the ECDEAST project resulted in high improvement of the situation in education in Russia. The Guidelines on engineering curriculum design aligned with the EQF and EUR Standarts have been developed. This will simplify the process of further Master programmes design and ensure their high quality.
However, for further enhancement of the education in Russia following recommendations should be made:

- Further dissemination has to be made on the Bologna process in Russia. For the maximum effect the contributions have to be presented by the European specialists in Russia.
- At the same time, have to be clearly specified and defined terms of a credit and of a module. These terms have to be defined in line with the European definitions.
- Education programme designers, representatives of the policy and government have to be deeply involved in the dissemination processes at all stages.
- When implementing European educations programmes in Russia, the Federal State standards have to be considered as they much limit their implementation.
- Changes in the education system have to be advertised among the employers, they have to be involved in design of programmes and in the education process at all levels.

LIST OF ACRONYMS:

B. Sc. – Bachelor of Science
BMSTU – Bauman Moscow State Technical University, Moscow, Russia
ECDEAST –- Engineering Curricula Design aligned with EQF and EUR-ACE Standards
ECTS – European Credit Transfer and Accumulation System
EQF – European Qualification Framework
EUR-ACE – European standards for the quality of engineering education
M. Sc. – Master of Science
R&D – Research and Development
SME – small and medium enterprises
SPbSPU – Saint-Petersburg State Polytechnic University, Saint-Petersburg, Russia
TPU – Tomsk Polytechnic University, Tomsk, Russia

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