Alexander Solovyev, Larisa Petrova

Moscow Automobile and Road Construction State Technical University (MADI)

MADI participation in the EQUASP project

Introduction

The United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro on 3-14 of June 1992 was the beginning of sustainable development movement [1]. The Conference marked the following challenges for sustainable development of the Global society:

- "systematic scrutiny of patterns of production — particularly the production of toxic components, such as lead in gasoline, or poisonous waste including radioactive chemicals,
- alternative sources of energy to replace the use of fossil fuels which delegates linked to global climate change,
- new reliance on public transportation systems in order to reduce vehicle emissions, congestion in cities and the health problems caused by polluted air and smoke,
- the growing usage and limited supply of water".

These challenges are the tasks for engineers to solve. Furthermore, during the World Engineering Education Forum (WEEF 2015) a special term of "resilient society" was born [2]. It means that if the society wants to follow the way of sustainability then engineers must attract public attention to the mentioned above challenges. Nevertheless, the critical thinking and professional engineering analysis of all data must exist against alarmism. Therefore, we all need qualitative engineering education.

National education system of the Russian Federation consists of institutions; and each of them conducts training on several Study Programmes. It is clear that the quality of component parts determines the total quality.

We suppose that an assurance procedure for Study Programmes (SPs) can provide its quality and will give the system of consumers' orientation in the national and international markets of higher education. There exist the following accreditation systems for SPs: the official (state) system, and public or public-professional systems on national and international level. In the époque of globalization international recognition of accreditation methodologies is necessary. We consider the system of self-assurance or internal assurance of SPs as an important part of preparation for any accreditation procedure. The harmonization of the tertiary education systems in the European Higher Education Area (EHEA) is the main objective of the Bologna process. Therefore, the internalization of SPs quality assurance process is important in the context of the Bologna process and its mainstream "Standards and Guidelines for QA in the European Higher Education Area (ESG)" [3].

All the mentioned above is the background for the objective of the EQUASP Tempus project: "To promote the improvement of the quality of technological SPs through the adoption of internal QA systems focused on the definition of learning outcomes and the definition and implementation of an online documentation and monitoring system of the quality of SPs consistent with the ESG. Consortium of 10 Russian technical universities, 4 technical universities from other European countries and 3 associations fulfilled the EQUASP project during the years 2014 – 2016. This paper describes the impact of the Moscow State Automobile and Road Construction University (MADI) in the joint work of the Consortium.

1. European approach to the quality of higher education

The European Association (former "Network") for Quality Assurance in Higher Education (ENQA) was established in 2000. The European Commission finances the Association; and its headquarters is located in Helsinki (Finland). ENQA developed the document named ESG: "Standards and Guidelines for Quality Assurance in the European Higher Education" [3]. In 2005, the meeting of Ministers of Education in Bergen validated ESG as the regulation for the EU countries and recommended it for other participants of the Bologna Process.

European Network for Accreditation of Engineering Education (ENAEE) transfers the principles of ESG to the engineering education. ENAEE contributes to:

- establishment of mutual trust in the systems of accreditation of engineering programmes in Europe,
- facilitating the exchange of information,
- negotiation of agreements on accreditation of engineering educational programmes and recognition of engineering qualifications,
- developing of standards for evaluation of learning outcomes or competences of graduates of engineering schools.

Graduates trained on engineering programmes of first or second level (bachelors and masters) accredited by ENAEE receive diploma certificates of European Accredited Engineer «EUR-ACE» [3]. ENAEE delegated such accreditation to the Accreditation Center of Association for Engineering Education of Russia (AEER) [4]. Now the European Commission focuses its attention on the task of improving the quality of higher education on the new organizational level. Realization of joint international projects such as EQUASP is one of the tools for solving this task.

2. General EQUASP Plan

The project plan of the EQUASP project contains the following Work Packages (WP) including documentation, its development and discussion [5]:

1. Standards and guidelines for QA of SPs.

2. Online documentation for QA of SPs.

2.1 Documentation for QA of SPs.

2.2 Methodologies and procedures of documentation.

2.3 Responsibilities and facilities for documentation.

2.4 Online-documentation software.

2.5 Implementation of responsibilities and facilities.

2.6 Implementation of documentation software.

3. Online monitoring of SPs quality perceived by the Interested Parties (IPs).

3.1 Questionnaires for monitoring of perceived quality.

3.2 Online monitoring software.

3.3 Implementation of online monitoring software.

4. Dissemination.

4.1 Project web site and informative material.

4.2 Dissemination meetings and final conference.

5. Sustainability.

5.1 Involvement of academic and administrative staff.

5.2 Recommendations for Ministry of Education and Science of RF (MESRF) and technical universities.

WPs were realized during workshops and training seminars. MADI staff members were delegated for participation in each activity. It was an active mobility process inside the country and abroad. A variety of consortium members had to perform project plan items. Standards and guidelines decided to be equal to ESG. There were no problems because the translation of the document into Russian exists. However, the documentation mentioned in the pp. 1, 2 of the Plan is original and it was very important to verify its Russian translation. Nevertheless, the strating workshops were devoted to both translating and discussing the documentation with active MADI team participation.

3. Contribution of MADI to the Implementation of Work Packages

The first step done by international consortium in carrying out the project was the development of "EQUASP glossary of terms". It bases on the Tuning Glossary of Terms [5] and uses some terms with the meanings commonly shared in the context of the EHEA. The "EQUASP glossary of terms" was translated into Russian. During the workshop discussions, MADI insisted that it is necessary for each English term to choose only one equal term among many possible Russian equivalents. It was done through collective efforts.

The other task was to align the content of the project items. The preliminary analysis has shown that not all the terms and process descriptions have the same sense in the proposed standards and in the Russian educational laws and prescriptions, because the education systems are rather different.

For example, EQUASP use the only term "study programme" but in Russian higher school, there are in use two terms: "basic educational programme" and "work programme" (in verbal translation). In this case, the participants choose the Russian equivalent "basic educational programme".

The second example is the term "learning outcomes". It is a key word in the modern system of EHEA. However, in Russian standards of higher education the term "competency" is in use instead of this the word. Therefore it is very important to synthesize the Tuning approach to competencies and learning outcomes.

The third example of contradictions consists in the identifying of the educational needs of the "interested parties" (IP). The term IP includes students, their parents, graduates, employers etc. The general approach of ENAEE is identifying these needs by the survey of an IP. However, the tendency of Russian government is the identification of the educational needs of the labour market in the form of "Professional Standards"; and the content of SPs must reflect it.

MADI has a vast experience both in the international cooperation with the International Society for Engineering Education – IGIP and in fulfilling of Tempus-Projects. Many MADI professors are the IGIP members; they are awarded the title "International Engineering Educator "ING-PAED IGIP" because they were trained according to the IGIP Curriculum i.e. a study programme for engineering teachers. Therefore, they are aware with the modern ideas in engineering education, such as the Bologna Process, sustainable development. Participation in IGIP international symposia allows us to navigate the issues of SPs quality assurance.

At the first stage of the project, the workshops were devoted to the consideration of the documents for the Work Packages 1 and 2 suggested by scientific director of the Project prof. Alfredo Squarzoni. Members of the Consortium introduced their proposals during the joint discussion. The aspects of correspondence of Criteria and Requirements for Programme Assessment of the EUR-ACE Guidelines with the Programme Assessment and Programme Accreditation and with the EQUASP S&G for iQA of SPs were discussed. The documentation

required for the process of SPs' accreditation in both was developed. At least, as mentioned above, in Russia the AEER accredits engineering SPs on behalf of ENAEE. On the other hand, introducing of the EQUASP system of on-line internal quality assurance (iQA) of engineering SPs in Russia is the aim of the Project. Therefore, it was necessary to establish correspondence of AEER Accreditation Criteria for first and second Cycle Programmes with the EQUASP S&G for iQAof SPs.

4. MADI contribution to the dissemination activities

Each of the universities-members of the EQUASP consortium organized workshops, seminars, conferences. For example, the Survey visit was carried out in MADI on 14-15 April 2014.

Two dissemination events "AEER Conference on Engineering Education" and "V International IGIP Regional Conference on Engineering Education "Actual problems of training engineers and teaching staff" were held on 11- 12 March 2015 in MADI [8].

Members of MADI team discussed the ideas of EQUASP system at the international conferences:

- International Conference on Interactive Collaborative Learning (ICL), WEEF 2014, 03-06 December 2014, Dubai, UAE: L. Petrova, A. Solovyev, The Problem of International Unification of Systems of Quality Assurance of Study Programmes [9].
- 44th Conference of the International Society for Engineering Education IGIP, 20-24 September 2015, Florence, Italy: L. Petrova, V. Prikhodko, A. Solovyev, Integration of the Study Programmes' Quality Assurance to the Internal Quality Management System in Russian Universities [10].
- ICL 2016 International Conference on Interactive Collaborative Learning, 20-23 September 2016, Belfast, UK: A. Solovyev, L. Petrova, V. Prikhodko, E. Makarenko, Quality of Study Programmes or Quality of Education [11].

In the list of References, there are other publications about EQUASP project and QA written by MADI authors [12 - 16].

5. Integration of the EQUASP QA-system to the MADI quality management system

On 26 May 2015, MADI organized an internal informational event: the workshop on the development of Quality Management System (QMS) in the University and on the problems of introduction of EQUASP online QA-system in QMS of MADI. MADI Educational-Methodical Direction and MADI Department of Quality of Education together with the EQUASP working group organized this workshop. Target group of participants consisted of teaching staff and leaders of universities' chairs: more than 40 representatives of 25 chairs took part in the workshop. The leader of the MADI EQUASP working group Prof. LARISA PETROVA presented the aims and the general information of the EQUASP project.

MADI Vice-rector on Educational Activity Prof. VIKTOR USHAKOV as the representative on QMS of university's top-management made a presentation "The tasks of realization of Federals State Educational Standards (FSES) 3+". It was underlined that the Methodical Recommendations of the Ministry of Education and Science of the Russian Federation (MESRF) demands to take into account the professional standards at the development of study programmes. So one of the urgent tasks in the integration of advanced QA-system in the university's QMS consists in the necessity to foresee the alignment of study programmes for different qualifications with forms of professional activity. Another necessary point is to stay within the regulations indicated in FSES on personnel requirements necessary for realization of study programmes.

Head of the Educational-Methodical Direction, the member of the EQUASP working group VERA PRUSOVA presented some new internal regulating documents on quality management system for organization of study process and methodical activity.

Head of the Department of Quality of Education YURIY SHTEFAN made a presentation "Development of quality management system in the framework of project-aimed approach".

It was specially mentioned that integration process of EQUASP QA-system of study programmes should respect the regulating documents of the MESRF, in particularly, the Order No 1376 of 19 December 2013 "On Approval of the Procedure of Organization and Realization of Educational Activity on Study Programmes of Higher Education" [17].

Methodical recommendations of the MESRF [18] indicate the following main requirements to the development of basic professional educational programmes of higher education (study programmes):

- Taking into account demands of professional standards during actualization of study programmes, forming of programmes' structure and contents;
- Determination of forms of professional activities;
- Forming of learning outcomes with a glance of professional standards;
- Expertise of study programmes by stakeholders, students and scientific-pedagogical staff.

So one of the urgent tasks in the integration of advanced QA-system consists in the necessity to foresee the alignment of study programmes for different qualifications with forms of professional activity. Another necessary point is to stay within the regulations indicated in FSES on personnel requirements necessary for realization of study programmes.

The following scheme is suggested for embedding of the EQUASP QA-system into the existing structure of QMS in MADI (Fig. 1). Matrix of responsibility distributes personal duties among persons involved.

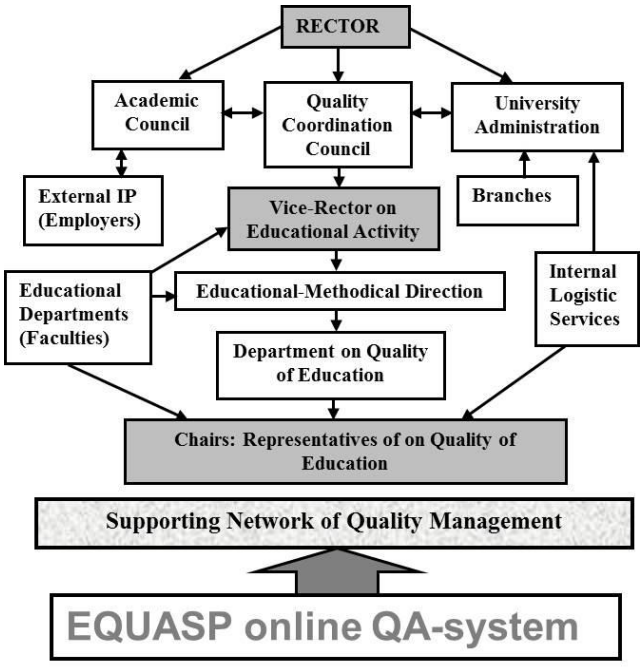

Fig. 1. Scheme of the embedding of the EQUASP QA-system into the existing QMS of MADI.

Vice-rector on Educational Activity is the representative on QMS of university's top-management; he is responsible for development, supporting and improvement of QMS. Quality Coordination Council coordinates the activity on QMS operation, makes general decisions. Department on Quality of Education (DCE) implements day-to-day activity on QMS operation, documentation, monitoring; it interacts with university's departments and chairs. Each chair has representatives on quality; they act in coordination with DCE in realization of internal tasks and inform teaching staff of the chair. According to this approach, EQUASP QA-system is supposed to become a part of supporting network of QMS.

The final step of introducing EQUASP QA system in MADI is the practical use of the English version of "the Software for the on-line Monitoring of the Quality of Study Programmes". The content of two SPs "Bachelor in Computer Engineering" and "Master in Computer Engineering" translated into English and introduced in the Software. According to the EQUASP standard, the content consists of:

A) Needs and Objectives,
B) Educational process,
C) Resources,
D) Monitoring and Results,
E) Management System.

Conclusion

It is clear that the EQUASP Software can be in use for other MADI engineering SPs. However, using English version in Russian university is strange. Therefore, we make two proposals. (1) It is necessary to translate the software into Russian. (2) If MESRF agree this system then it will be in use in many Russian universities.

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