Professional Accreditation of Engineering Programmes and EUR-ACE labels in Central Asia

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Today the process of accreditation of educational programmes is widely recognized as one the most efficient ways to improve the quality of education and as an entry route to the engineering profession. It is crucial to develop system of continuous programmes improvement at universities through an independent external accreditation of educational programmes by the agencies representing national and international professional community.

External evaluation process leads to several positive impacts. It helps to increase credibility to the programme from different stakeholders. International recognition gained upon successful accreditation of the educational programme facilitates its competitiveness and accountability and leads to real quality improvement of the whole educational programme[1].

The first steps in setting up and implementing a system of Quality Assurance of engineering education in Central Asia were made within the TEMPUS project QUEECA (Quality of Engineering Education in Central Asia [2]) started in 2012. The QUEECA TEMPUS project main aim is to set up and to implement a system of quality assurance (QA) of engineering education in Central Asia (CA), finalised to the accreditation of engineering programmes by the award of the EUR-ACE quality label on the basis of the EUR-ACE Framework Standards and related quality requirements and procedures.

The introduction of easy comparable practices for the accreditation of programmes in the engineering/technology field is hence the main change at national level the QUEECA TEMPUS project is aiming at. The self-sustainability of this strategy is being assured thanks to a massive involvement of relevant actors in all consortium members' countries. Partner countries' Ministries are actively involved in the project in order to comply with legislation obligations as far as Higher Education (HE) system changes are concerned.

The involvement of academics and students at large scale is also being ensured through the active participation of ENAEE and SEFI associations (the main actors in the field of engineering education with a direct involvement in the accreditation issues).

Training a pool of experts in QA issues became another significant outcome of the QUEECA project. A series of training workshops for experts in preparing programs for professional accreditation was hold in 4 CA countries: Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. Training of experts was recognised a crucial step to achieve the main project goal, thus quality of external independent assessment of educational programs vastly depends on the following issues:

- Selection of experts;
- Training of experts;
- Motivation of experts.

Success of external independent assessment substantially depends on correct selection of experts – future participants of educational programs' assessments. Potential experts shall tentatively comply with the following requirements:

- Show interest in engineering education improvement,
- Have higher education management experience and recognition in a certain field of activity,
- Have an academic degree in a corresponding field,
- Be able to use the Internet, e-mail, word processing programs (Microsoft Word) and PDF files.

When talking about a specific field of activity it shall be noted that experts have to deal with various educational programmes in the field of engineering and technology [3].

Experts may be selected from representatives of various Higher Education Institutions (HEIs) and HEIs structures and they may have various statuses, functional abilities and work experience in their respective HEIs. Selection depends on the type of expert information we would like to obtain from future member of expert group during an accreditation visit.

According to HIE status potential experts may form the following groups:

- Administrators – HEI specialists who are well aware of organization of administrative and financial-economic aspects of HEI activities;
- Methodologists – specialists with methodological work experience in the field of creation, implementation and development of educational programs. Such candidates, obviously, shall possess methodological perspective that exceeds the limitations of their own HEI, having knowledge of methodological rules, regulations and materials at the federal level and aware of trends and approaches to methodological work implemented by international academic society;
- Specialists – teacher with a comprehensive experience of teaching and knowledge in the fields relevant to educational programs presented for accreditation.

Any expert group is supposed to be a combination of representatives from three groups mentioned above. Besides, as practice shows, quality of experts group's work increases when it consists of experts of different ages, temperaments, occupational statuses, production and life experience.

Let us consider major principles applied to selection of experts and limitations that shall be noted during selection of potential experts.

First of all, an expert shall not be a person to provide final opinion on the basis of received information even if he/she is a recognized specialist who can contribute a lot to educational program assessment. An expert may only be an equal member of expert group with the right to express his/her opinion (even if this opinion is a dissenting one). Otherwise it may lead to a situation when opinions of other members of experts group will depend on opinion of this specialist and an assessment outcome will be provided on the subjective basis.

Secondly, not every specialist even the most recognized in his field can become a member of an expert group. Some of them, even those with comprehensive knowledge, do not have qualities required for a member of an expert group and are not able to provide adequate opinion which may disrupt assessment especially during meetings with representatives of students and teachers participating in accredited program.

That is why the first criterion for experts' selection is the degree of their competence. There is of course an issue with evaluation of such competence. Usually competence is evaluated on the basis of obvious factors such academic degree and title and length of work in HEI. However, a more thorough selection of potential experts may be carried out with account of their occupational status, number of published works in the subject's field, public recognition of such potential expert as a professional in the field.

Second criterion is the degree of candidate's actual knowledge of the latest scientific and practical achievements in relevant fields, in methodology and management of development and implementation of engineering education programmes. It is also very important to carry out a qualitative analysis of scientific-methodological and practical activity of an expert over the last years.

The third criterion is a reasonable of candidate's niche expertise and his/her general knowledge. Evaluation of candidates in this area required assessment of their methodological and scientific works.

Finally, the fourth criterion is an optimal combination of candidates' individual qualities. This shall include ability to work in a team, tolerance to opinions that differ from their own, ability to provide comprehensive and objective evaluation of problems without being too optimistic or too pessimistic, patience, friendliness and tactfulness.

Expert commission shall consist of specialists in the field of HEI administrative-methodological activities and in specific subject areas that include engineering education programmes. Thus, it is logically assumed that opinions of specialists shall be taken into account mostly in the sphere that is related to evaluated criterion. For example, in order to provide a relevant opinion in human resources part of the programme experts shall possess work experience in a teaching group, knowledge of HEI fundamentals of department's activities financing, etc. At the same time opinion of other experts group members could not be underestimated even if such experts are not highly competent in this sphere.

Any aspect of educational programme implementation could be considered separately but only in close connection with all other elements.
In some cases selection of potential experts may be substituted by their appointment by management. Technically it is a simple way of selection in the form of the head's order of participation in experts' training. However, it is obvious that this practice defies a principle of voluntary participation of experts in public-professional accreditation of educational programmes. Even though cost of experts' selection is minimal in this case, there is a strong possibility that this experts' group will consist of people loyal to management and their future opinions may become similar to a private opinion of management. As a result opinions of experts' group in the process of educational programme assessment may shift to opinions of specialists who are not conflict prone which may also lead to open critics of HEI administration and educational programme management. Another extreme possibility of such appointment is selection of specialists with increased social activity but not always competent which is not beneficial for the process either.
As it was noted earlier it is important that potential experts voluntarily participate in further training and expert visits to HEIs. This voluntary participation and interest of experts are important components of their successful expert activity in future.

Previous paragraph described qualities and characteristics considered during selection of potential experts and evaluation of experts' activity at the stage of their familiarization with educational programme self-assessment materials and during accreditation visit to HEI. Now let us see how experts are trained as it is, obviously, not enough to just be a professional in his/her field and have methodological experience to assess EP quality. Potential experts shall have special knowledge of accreditation procedure and criteria. Besides, it is advisable that they shall have some perspective in this field of activity and understand how these processes are implemented in other countries. A sample agenda for initial training of experts is given below in Table 1.

Table 1

Sample training seminar agenda

Day 1

Activity	**Participants**	**Start time**	**Duration**
Professional accreditation of educational programmes: system development	All	10:00	1:30
Coffee-break	All	11:30	0:15
Criteria and procedure for accreditation of educational programmes	All	11:45	1:30
Lunch	All	13:15	1:00
Self-study procedure (university and educational programmes)	All	14:15	1:30
Coffee-break	All	15:45	0:15
Audit of educational programmes of the university	All	16:00	1:30
Distribution and comments on handout and reference materials	All	17:30	

Day 2

Exercise 1 (Objectives of the educational programme)	By groups	09:00	Step 1 …..0:20 Step 2 …..0:20
Exercise 2 (Learning outcomes)	By groups	09:40	Step 1 …..0:20 Step 2 …..0:20
Coffee-break	All	10:20	0:15
Discussion of the group work results	All	10:35	0:40
Exercise 3 (Correspondence of educational programme objectives and learning outcomes)	By groups	11:15	0:30
Exercise 4 (Compliance with the AEER requirements to the learning outcomes)	By groups	11:45	0:40
Discussion of the group work results	All	12:25	0:40
Lunch	All	13:05	1:00
Exercise 5 (Correlation between learning outcomes and study disciplines)	By groups	14:05	0:40
Exercise 6 (Assessment tools)	By groups	14:45	0:40
Coffee-break	All	15:25	0:15
Discussion of the group work results	All	15:40	0:40

Day 3

Presentation of homework results	All	10:00	1:25
Coffee Break	All	11:25	0:15
Presentation of homework	All	11:40	1:30
Conclusions. Certificates awarding	All	13:10	

As this sample programme shows training of experts start with studies of a general situation in educational programmes accreditation sphere, its influence on engineering education development in the country, promotion of its quality improvement and assurance of international recognition of the system of EPs quality assessment in general and its specific accredited EPs [4]. Further on experts study particular features of public-professional accreditation of engineering education programmes in various countries. Despite the fact that accreditation procedure and criteria applied to activities of all national accrediting bodies are “essentially equivalent”, it is important to note specifics and traditions of countries where these programmes are implemented and assessed. Successful work of expert is practically impossible without comprehensive knowledge in this sphere.

Upon consideration of these basic issues experts are engaged in special training which includes detailed study of criteria applied to accreditation of programmes of the first and second educational cycles. An expert shall be familiar with all criteria requirements and methods of EPs qualitative analysis in accordance with criteria basis, as well as with quantitative requirements to EPs of various cycles (content of EPs in general and per subject in ECTS points, number of programme subjects' teachers with PhD and ScD, etc.)
A substantial part of experts' training is allocated to practical classes. During these classes experts learn to analyze EPs goals and outcomes, their compliance with HEI mission and strategy and employers' requirements, efficiency of mechanisms used for adjustment of EP goals and outcomes.
During the final part of their studies experts become familiar with accreditation visit report forms, order and procedure of their preparation. Moreover, experts study the professional ethics code and requirements related to conflict of interest between HIE and experts.

Training workshops were carried out by the Association for Engineering Education of Russia [5] (ENAEE member) in all four member-countries within the frames of the QUEECA project:

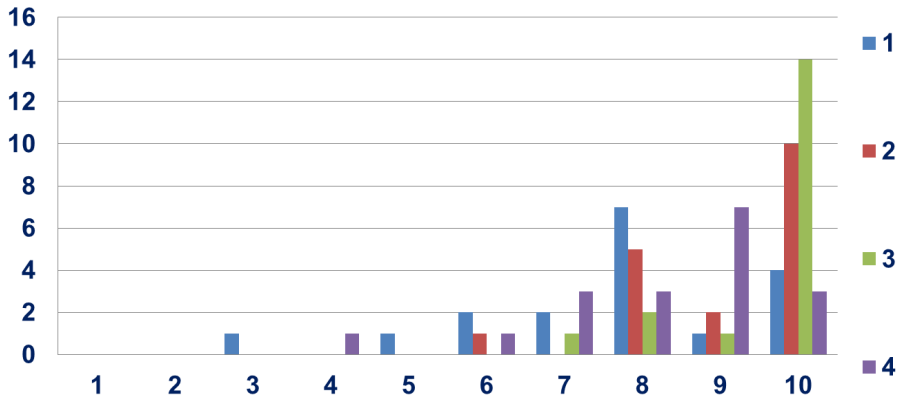
- Tashkent (Uzbekistan) - 25-30.05.2014
- Almaty (Kazakhstan) - 30.06.- 2.07.2014
- Dushanbe (Tajikistan) - 20-22.10.2014
- Bishkek (Kyrgyzstan) - 01-03.03.2015

Number of participants varied from 25 to 30 people.
• Representatives of the academic community - 70% of the total number of participants
Faculty members of higher education institutions (professors, associate professors, heads of research and educational units (institutions departments) aware of content and organizational aspects of the educational process;
• Industry representatives - 10% of the total number of participants
Representatives of business and industry, involved in the process of training engineers able to critically assess the competence (learning outcomes) of students and graduates of the educational programme;
• Representatives of the management and administrative staff of higher education institutions / accreditation agencies - 20% of the total number of participants
Proactive and motivated employees who intend to do the work of organizing and supervising the process of accreditation of educational programs in the field of engineering and technology, fluent in English.

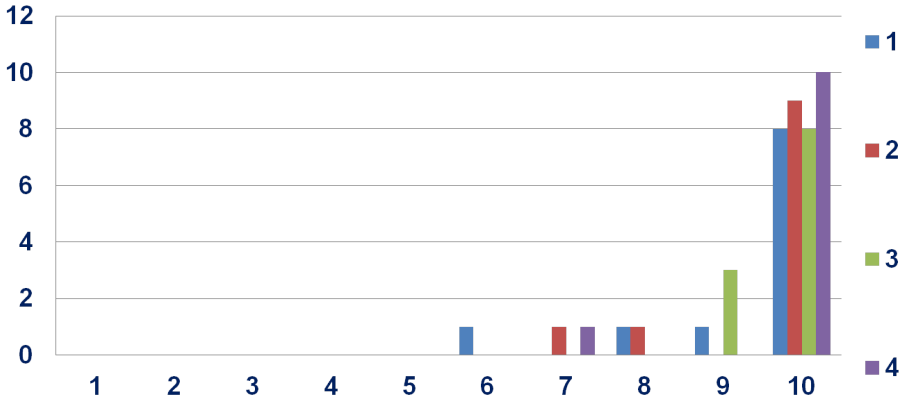
Usually after the seminars participants were given a questionnaire to get their feedback on classes' quality. It included the following questions:

1. Seminar duration
2. Seminar content (themes, sections)
3. Teaching level (method, style, a presentation materials
4. Level of the organisation of a seminar (lecture-room, equipment, distributed materials, etc.

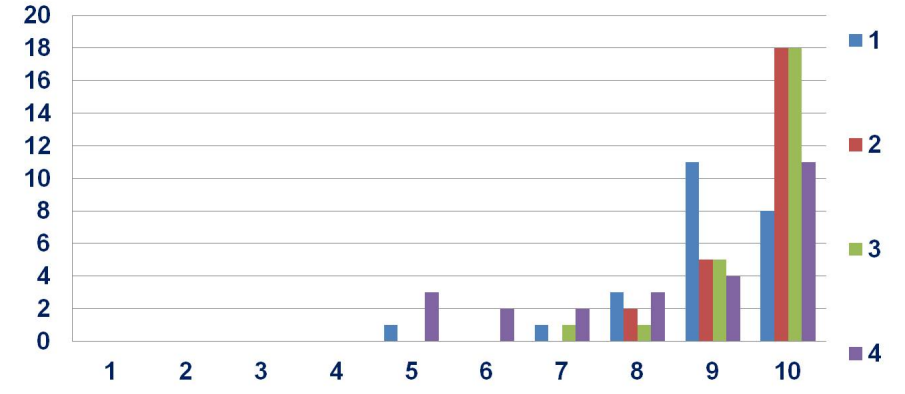
Maximum grade was 10 and minimum grade was 1. Below answers' options are given:



Distribution of experts' grades in Dushanbe



Distribution of experts' grades in Tashkent



Distribution of experts' grades in Almaty

After training participants become aware of accreditation procedures & criteria and acquire skills needed to prepare educational programmes at their home universities for further international accreditation, including but not limited to EUR-ACE Label. Participants who successfully complete all training tasks are awarded accreditation expert certificate of the Association for Engineering Education of Russia and nominated the title *expert candidate*. Once participated in the on-sight accreditation visit as an audit-team member the candidate is included in the AEER experts' database and becomes *active expert*.

References

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