Mid Project Milestone for the QUEECA TEMPUS Project: First Results and Rising Expectations

Borri, C.
Full Professor and Head of the Department of Civil and Environmental Engineering (DICeA)
School of Engineering, University of Florence
Florence, Italy

Guberti, E.[1]
Head of the Interdepartmental Research Unit (EER)
School of Engineering, University of Florence
Florence, Italy

Betti, M.
Assistant Professor at the Department of Civil and Environmental Engineering (DICeA)
School of Engineering, University of Florence
Florence, Italy

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INTRODUCTION

The QUEECA (Quality of Engineering Education in Central Asia) TEMPUS project main aim is to set up and to implement a system of quality assurance (QA) of engineering education in Central Asia (CA), finalized 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 project also takes advantage of experience in the European Higher Education Area Education (EHEA) through ENAEE and current efforts in Central Asia countries. More specifically, QUEECA intends to refer to the EUR-ACE Framework Standards (EAFS) and related quality requirements, awarding the EUR-ACE quality label to the accredited programmes. The process will consist in following steps: i) Create National EE Societies (in Kazakhstan, strengthen the already existing KazSEE) and a CA Federation of EES, partnered with SEFI and IFEES; b) Adapt the EUR-ACE Framework Standards (EAFS) and formulate CA Standards (CAEAS) in Russian and English; c) Create Accreditation Centres in each country (with a Regional coordination); train the relevant experts ("accreditors"); d) Run a series of "Trial Accreditations" with international teams to test the draft CAEAS and the local accreditors; e) Taking account of the results of the "Trial Accreditations", formulate the final version of CAEAS; f) Conduct a first run of (real) accreditations of eng. programmes and award the first EUR-ACE labels throughout CA; g) Formulate a self-supporting financial plan for carrying out accreditations after the project closure (sustainability plan).

At the present moment (April 2014) the project has arrived to the mid project milestone and time has come for a thorough internal evaluation taking into account the encouraging results so far obtained, such as the creation of the Kyrgyz Society for engineering Education (October 2013) and the rising expectations from the concerned parties. At the same time, the first steps are done for the foundation of an equivalent organization in Uzbekistan.

[1] Corresponding Author: Guberti, E.

The paper, shortly, introduces the QUEECA TEMPUS project and reports about the achieved results and the activities scheduled for the next moths. Finally it will be shown why the project is to be considered as a pioneer one, introducing the EUR-ACE system outside the European Union but still in "Bologna EHEA countries" with an easy replicable model are also given.

1 THE QUEECA PROJECT RATIONALE

In Central Asian (CA) countries, the need for international recognition of engineering degrees is becoming more and more demanded at several levels. Two types of accreditation of education are, for example, actually taking place in Kazakhstan an institutional one - for an estimation of activity of the Higher Education Institutions (HEIs) and a specialized one - for a quality estimation of curricula. Institutional accreditation is organized by the Ministry of Education and Science and carried out by National Accreditation Centres. The specialized accreditation is carried out by international accreditation agencies or accreditation organizations created by (or strongly connected with) professional associations. The CA governments are interested in creating and developing internationally recognized systems of educational and professional qualifications: in particular, the creation of accreditation organizations belonging to international networks is an urgent need. Kazakhstan and the other CA countries have declared their priority interest in the implementation of their Engineering and Technical programmes in analogy to the European Qualification Frameworks (EQF). However, international recognition of qualifications and programmes can only happen if the fulfilment of shared qualification standard is assessed through a periodic evaluation of study programmes by both internal QA and peer review processes. Following this growing interest towards the internalization of CA engineering degrees, the assessment procedure of the EUR-ACE [1]-[4] system is the natural answer to these emerging requirements.

In this respect, the main aim of the QUEECA project is to promote the adoption, taking account of the peculiar conditions of the CA countries, of the EUR-ACE system in the partner countries, thus increasing the impact and attractiveness of Bologna principles among Engineering and Technology higher education institutions: the achievement of objectives for QUEECA will give a significant contribution to the implementation of the Bologna process among the involved partner countries and region.

Several target groups are potentially interested by the award of EUR-ACE labels: a) employers are guaranteed of the quality of graduates from an EUR-ACE-accredited programme, without the necessity of direct knowledge of the contents and outcomes of the educational programme the graduates have followed; b) HEIs can advertise their EUR-ACE-accredited programmes stating that their learning outcomes have been recognized as satisfactory from both the academic and the professional viewpoint; c) students are guaranteed of the quality and professional relevance of their degree, if EUR-ACE-accredited; d) engineering professional organizations can be satisfied about the educational requirements of the EUR-ACE graduates who want to enter into their registers [5]-[6]. QUEECA is therefore a great opportunity to extend the EQF and the ENAEE assessment procedure model into CA countries, thus facilitating the trans-national recognition of educational and professional qualifications of engineer graduates.

Following paragraphs shortly discusses the objective, the expected outcomes and the activities of the QUEECA TEMPUS project.

1.1 Objectives

QUEECA aims at setting up and implementing a system of QA of Engineering Education (EE) in CA countries, finalized to the pre-professional accreditation of engineering programmes (i.e. accreditation of educational programmes as entry route to the engineer profession). The accredited programmes must satisfy the same pre-requisites for the award of the EUR-ACE quality label, i.e. the EUR-ACE Framework Standards (EAFS) and the European Standards and Guidelines for Quality Assurance in Higher Education. This will be achieved by the creation of a network of National QA/accreditation Agencies (and possibly a Regional Federation) able to accredit engineering programmes and authorized by ENAEE to award the EUR-ACE quality label.

Through all above introduced structural measures, mobility of engineering students from and to Central Asia as well as the mutual recognition of degrees within the EHEA will improve decisively. Last

but not least, future cooperation within HEI in Europe and Central Asia will be favoured, as, for instance, the participation in new Actions of Erasmus +.

1.2 Outcomes and Project Plan

The project objectives are met through the creation of a network of National QA/accreditation Agencies able to accredit engineering programmes and authorized by ENAEE to award the EUR-ACE quality label. The main expected outcomes from the QUEECA TEMPUS project can be hence itemized as follows:

1. To create a National EE Society where it does not exist (in Kazakhstan, strengthen the existing KazSEE) and a CA Federation of EE Societies, partnered with SEFI and IFEES.
2. To adapt the EAFS and formulate analogous CA Standards (CAEAS) in Russian and English.
3. To create Accreditation Centres in each CA country (with a Regional coordination); train the relevant “accreditors“.
4. To run a series of Trial Accreditations with international teams to test the draft CAEAS and the local accreditors.
5. To take into account the Trial Accreditations results, formulate the final version of CAEAS.
6. To conduct a first run of pilot accreditation of engineering programmes and award the first EUR-ACE labels in CA.
7. To formulate a self-supporting financial plan for carrying out accreditation after the project closure.

2 THE MANAGEMENT AND GOVERNANCE

The introduction of easy comparable practices for the accreditation of programmes in the Engineering/Technology field is the main change at national level QUEECA is aiming at. The self-sustainability (and consequently the success) of this strategy is being assured thanks to a massive involvement of relevant actors in all consortium members countries. Students will also play a key role in the second half of the project as they will be interviewed at the occasion of training courses at HE institutions in the partners’ countries. Partner countries' Ministries are also actively involved in the project in order to comply with legislation obligations as far as HE system changes are concerned. Given the project structure it is evident that the involvement of academics and students at large scale occurs mainly thanks to the active participation of ENAEE and SEFI. These European associations can in fact be listed among the main actors in the field of Engineering Education with a direct involvement in the accreditation issues.

With specific reference to the main priority (governance reform) of the QUEECA project, which is the introduction of quality assurance, this is to report about a general agreement between the project activities and the actual needs and priorities of the concerned partner higher education institutions. The creation of national, self-sustainable EE (Engineering Education) societies and strictly connected accreditation centres in charge with quality assurance and accreditation issues appears to be as such as a very ambitious goal of the project, impacting directly the local (KZ, UZ, KG and TJ) university management and governance. Furthermore the autonomy and the self-sustainability of such bodies will augment the outcomes of the project as this has to solely transfer know how and encourage capacity building in the concerned countries. This is believed to be the main added value of the whole initiative and a great asset for the involved CA partners.

3 STAFF TRAINING AND MOBILITY

CA partners staff training is one of the key activities of the QUEECA project as it precisely aims at transferring knowledge and creating competences within the CA partners institutions in order to let them gain enough confidence and knowhow to proceed autonomously to quality assurance and accreditation processes in the field of engineering education. With this respect, and in the framework of its workpackages (in particular the number 4 “WP 4: Setting up National Engineering Accreditation Centres” and the number 5 “WP 5: Accreditation of programmes”), the QUEECA project is now (April 2014) scheduling the intensive training session targeted to enable the local experts to become competitive specialist in the field of accreditation and quality assurance for engineering education. The first of such activities was carried out in Bishkek (KG) at the end of March 2014.

More in general, the training courses are being developed mainly with the help of ENAEE Member Associations which have a consolidated experience in accreditation of engineering programmes (CTI,

ASIIN, Engineers Ireland, Engineering Council and AEER) and of other experts from a Europe-wide Association such as SEFI. The courses are being scheduled to take place in several locations throughout CA. The peers-evaluators will be trained for assessing engineering educational programmes on the basis of the EUR-ACE Standards. To implement national qualifications frameworks with an understanding of and according to the same interpretation of the overarching European framework, a common methodology based on learning outcomes (i.e. knowledge, skills and competencies descriptors), as well as a common approach to their self-certification is probably the most important instrument of the QUEECA project. CAEAS standards will be tested at a later stage and eventually approved through trial accreditations. Will be followed by ad hoc workshops to be organised in Central Asia by accreditation centres in order to become fully operative to start with these last the accreditation visits. Moreover the intensive English (and Technical English) training courses must also be reported under this section as they have been conceived and implemented in order to enable future specialists to be familiar with the accreditation processes.

Staff mobility is taking place within the project mainly for: attending the project meetings, including public workshops and events, taking part to the training activities, delivering training activities and disseminating the project results. In case of internal meetings (such as the management board meetings) the participants are the members of the designated board and no particular procedure is adopted to select the participants. With respect to this type of mobility, active involvement of the partner institutions has been observed from the very beginning, despite the long and heavy travel itineraries between CA and Europe. Also in the light of this consideration a merge of meetings is being adopted in order to save (as much as possible) both time and financial resources. The presence of all partner institutions to the project meetings has efficiently contributed to establish a friendly and cooperative atmosphere and to enable the partners to know each other. On the other hands public events (e.g. the QUEECA forum organised in Almaty in April 2013) see the participation also of a larger audience, including local stakeholders, university management representatives and policy makers gathered through an intense activity of dissemination by the local partners.

As far as the training activities are concerned (intensive language courses and training sessions for accreditation experts) the attending participants have been identified within the CA partner institution on the basis of a specific interest to pioneer the way. These people are mainly to be identified with the chair of the degree courses that will have to undergo the accreditation process in the second half of the project. It appears to be pertinent to mention that the partner's home institutions strongly encourage the mobility of their staff and the participation of their representative people in the project activities.

4 ACADEMIC CO-ORDINATION AND MANAGEMENT

The Management Structure of the Project includes the Project Board (plenary assembly where all partner institutions are represented) and the Project Management Board (smaller executive board). The QUEECA Project Board (PB) is mainly focused on the coordination and implementation of project activities, the monitoring of the proposed objectives, outcomes, activities and budget management and it is constituted by one representative per partner Institution and chaired by the Legal representative of the contracting partner institution. The PB identified and nominated the QUEECA Management Board (MB) made up by representatives from one Institution per involved country.

The monitoring of the project activities, including the implementation of the quality control, is the main task of the MB. Meetings of this governing body are taking regularly place, although in conjunction with other project activities in the best interest of the project efficiency, in order to assure the project with the necessary internal quality assessment and control. The Management Board meets twice a year and verifies the quality control also taking into account the reports prepared by the external experts. Moreover, the solid previous experience of the EU partners in the field of European cooperation project in Engineering Education appeared to be an asset to guarantee the project with a smooth and effective management. This experience, considering the contribution offered in the past by University of Florence-School of Engineering to the implementation in many countries of the EUR-ACE System, is in fact offering an effective benchmark of the results to be reached allowing a continuous check of the project development. The Management Board is also in charge of elaborating a detailed dissemination strategy that will be implemented by all partners for the whole duration of the project and after its ending. The main target will be the external audience (stakeholders, employers, professional orders and students) particularly in partner countries.

Finally day by day activity is under the responsibility of the Project Manager identified within the coordinating institution. It appears pertinent to mention that a strict synchronization with the CA partner's coordinator (Onolkan Umankulova) is maintained in order to ensure that the activities are being managed in the best interest of the direct beneficiaries of the project (the Central Asia partners). It is than care of the CA partner's coordinator to keep all partner institutions updated on the current activities. Besides each CA country identified a coordinator to be in touch with CA partner's coordinator for assuring timely coordination of the project activities among all of the partners. Moreover the project web site is maintained updated in order to keep the partners constantly informed on the project activities. As a matter of fact, intense communication is taking place through the CA partner's coordinator with the aim to enhance partners' awareness on the project activities. Moreover twin web pages of the main QUEECA web site have been opened in the local languages. These measures help to improve the project and ensure the success of its activities.

5 SUSTAINABILITY

Sustainability and long-term effectiveness of the results are key-points of the project, and they are guaranteed by the creation during the project lifetime of independent permanent agencies in Central Asia to carry out the accreditation of curricula in the field of engineering and technology in accordance to the European quality Label EUR-ACE. Concrete steps (such as the establishment of the Kyrgyz Society for Engineering Education) have been taken in order to allow the creation of these agencies and to ensure that they gain the necessary experience to carry out self-sustainable international accreditations of curricula of the Central Asian Higher Education Institutions. This is being achieved with the help and expertise of European Higher Education Institutions and Associations and of the KZ partners who already have some experience in the field.

The new agencies will be very competitive in comparison to similar European and American ones as the accreditations will have lower costs due to the significant reduction of transport costs and the lower wages of experts of Central Asia. In addition, the possible award of the EUR-ACE label will improve attractiveness and international recognition of such accreditations. The sustainability is also foreseen within partnership with Centrals Asian Network for Quality Assurance (CANQA), that will provide the platform for communication among the agencies and other CA partners in QA area.

QUEECA is moreover helping to improve the preparation of quality of experts in the field of engineering and technologies in CA, their competitiveness at international level, and also the transparency and comparability of their titles, through the creation of accreditation agencies and systems respecting the developed international criteria corresponding to the European quality label EUR-ACE. The increase in the international recognition of the degrees of engineering graduates of the Central Asian HEIs in the European countries will take place as the accreditation of programmes according to the EUR-ACE Framework Standards allows the comparison of outcome results i.e. of the content of the formation, instead of the duration of the curricula. The project is promoting the development of curricula in cooperation with the European universities, to the creation of double degree programmes and the development of curricula in Central Asia which are similar to the ones of European Union.

6 QUALITY CONTROL AND MONITORING

As above mentioned the internal quality assurance of the project is mainly dealt within the Management Board of the project. This is in fact the body in charge with the assessment of the project activities and the periodic control with respect to the project original workplan. Questionnaires to be distributed at the occasion of project meetings have been used at the very beginning of the project. On the other hand the project has been provided with an additional quality assurance body. In fact according to the discussions held at the level of the QUEECA Project Board two appointments for external experts providing the project with external quality assessment and evaluation were approved. The two experts (Prof. Stephanie Farrell and Prof. Andrzej Rucinski) are permanently invited to all the project meetings and have to produce annual reports on the project progresses, which should be focused on the respect of the original plans. In particular their specific tasks include:

1. provide expertise in the planning, delivery and assessment of the educational process;
2. provide in-depth knowledge of engineering pedagogy, learner-centered teaching methods;

3. provide global experience leading instructional development workshops related to engineering education and pedagogy.
4. provide expertise related to an extensive work in Kazakhstan related to faculty development, educational innovation, academic mobility, student exchange, and research collaboration.

The external experts have participated in two project board and project management board meetings thus far: in October 2012 in Italy and in April 2013 in Kazakhstan. They also plan to attend the project board and project management board meetings in Firenze in June 2014. At the end of year one, an implementation evaluation was conducted by the external experts. The purpose of this formative evaluation was to assess on-going project activities and to provide information to monitor and improve the process.

7 SETTING UP NATIONAL ENGINEERING ACCREDITATION CENTERS

The Concept of the Training Visits foresees that, in the four participating countries, workshops are conducted with a double purpose: to engage in internal Quality Assurance capacity building of the participating Central Asian Higher Education Institutions (on the one hand), and to train the future accreditation agencies (to be developed out of the newly established engineering societies). In the first track, the university representatives will learn how to write a self-assessment report and are generally familiarized with state of the art in setting up internal quality assurance systems. In a parallel process the representatives of the accreditations agencies in status *nascendi* including their future peers will be trained in best practice of external quality assurance, including the analysis of SAR, interviewing techniques, the art of writing reports etc. The first in a sequence of 4 workshops took place between the 24-26th of March in Bishkek (KG), others have been scheduled.

The candidates for trial accreditations are currently selected. In Kirgizstan, where the first workshop has been carried out at the end of March, two programs already have been selected. At Kyrgyz State Technical University Bachelor programs - «Information and communication technologies and systems in communication», at Kyrgyz State University of Construction, Transportation and Architecture - “Constructing”. It is foreseen that in each country the two participating universities will propose one program each; in Kazakhstan, which is the only partner with altogether 5 participating HEIs, the partners equally have to agree on the two selected programmes they are putting forward for external review.

8 PROGRESS AND MID PROJECT MILESTONE

At the present moment (April2014) the project has arrived to its half lifetime and according to the results of an internal evaluation by the Management Project it appears important to report that results so far obtained are pretty encouraging. As far as the project management is concerned the partnership appears solid, determinate and the procedures have been standardised. Moreover, looking to the fulfilment of specific goals, such as the creation of the Kyrgyz Society for Engineering Education (October 2013). Some of the project’s milestones have been already completely achieved. Rising expectations from the concerned parties have also to be reported. With respect to the QUEECA project workplan, the progress made on each workpackage can be itemized as follows:

1. Development of intensive Language Courses. Intensive English courses have been completed at TGTU and TITU (Uzbekistan). English language courses have also been organized in Tajikistan.
2. Development of Central Asia Engineering Accreditation Standards (CAEAS). The statute of the Association for Engineering Education of Uzbekistan has been developed and sent to the Ministry of Higher Education and National Center for Testing for approval.
3. Establishment of national engineering societies and a Central Asian Federation of Engineering Education Societies. Conditions have been prepared in Tajikistan for the establishment of an engineering education society that includes representatives from technical universities, employers, independent engineering associations and experts in higher engineering education.
4. Establishment of National Engineering Accreditation Centers. Tajikistan has begun the process of establishing an independent body for accreditation by meeting with corporate stakeholders and professional societies with the aim of gaining support for the initiative. In addition, a student group was established to gain student perspective on the process. In Uzbekistan, the State Testing Centre under the Cabinet Ministries performs tasks related to quality assurance and ratings.
5. Accreditation of Central Asian Programs. Planned as future work

6. Management of the project via project management meetings. Project management meetings have taken place in October 2012 (Italy), March 2013 (Kazakhstan) and October 2013 (Uzbekistan).
7. Performance of quality control and monitoring processes. Planned as future work
8. Dissemination of QUEECA outcomes. All reported activities are posted on the QUEECA website www.queeca.eu.
9. Exploitation of results. A series of national workshops organized by National Accreditation Centres in Central Asian Countries has been implemented. In June 2013, workshops were conducted in Kyrgyzstan, Tajikistan, and Uzbekistan. The Tajik workshop focused on "Quality of Engineering Education in Central Asia". The Uzbek workshop focused on the "Creation of National Engineering Education Societies in Central Asia". The workshops were attended by representatives of each of the four Central Asian countries represented in the project.

A part from the list of progress made on each workpackage above reported it appears pertinent to mention that the "QUEECA Standards and Guidelines ('QUEECA Model') for the internal quality assurance of study programmes in engineering" (EN version) has been elaborated and formally approved by all the partners of the project at the occasion of the 4th Management Board meeting held in Bishkek (KG) in March 2014. Moreover a Russian version of this document has been also produced in order to enhance its readability and applicability throughout the CA partner countries.

9 CONCLUSIVE REMARKS, FUTURE DEVELOPMENTS AND RISING EXPECTATIONS

The paper presented the recent outcomes of the Tempus project QUEECA led by the University of Florence, School of Engineering, under the leadership of Prof. Claudio Borri. The QUEECA project involves 4 out (Kazakhstan, Kyrgyzstan, Uzbekistan and Tajikistan) of 5 TEMPUS countries in Central Asia (CA) and aims at setting up and implementing a system of Quality Assurance (QA) of Engineering Education (EE) in CA countries through the creation of a network of National QA accreditation Agencies able to accredit engineering programmes and authorized by ENAEE to award the EUR-ACE quality. At the present moment (April2014) the project has arrived to its half life-time. In the second half of the eligibility period all project activities related to the accreditation processes in the CA partner countries have been planned. It is expected that the partner countries will have a very active role and that they will gain significant autonomy. The Management Board of the project, which has repeatedly met, has now decided a reorganization of some remaining activity without any change in the expected outcomes. These changes are aimed at a better efficiency for the smooth running of the project. It appears pertinent to mention that given its specificities the project can be considered a pioneer one, introducing the EUR-ACE system outside the European Union with an easy replicable model are also given. As a matter of fact expressions of interest also from outside the CA partners of this project have been received and it is reasonable to think that the EUR-ACE model could be successfully spread also to other geographical areas [7]-[9]. In this framework the QUEECA TEMPUS project appears to be an important asset for the European Accreditation System as it significantly contribute to its spreading also behind the European Union area. Moreover it appears important to mention that the adopted approach appears to be fully bottom up thus giving important prior guarantees on its possible success. As to the unexpected autcomes, it is quite evident that amongst the CA Institution the expectations concerning a rapid integration into European QA standards are concretely rising. It is likely that the CA accreditation agencies will join ENAEE.

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Appendix: Main Acronyms used in the paper

AEER:	Association for Engineering Education of Russia
ASIIN:	Accreditation Agency for Degree Programmes in Engineering, Informatics, the Natural Sciences and Mathematics (DE)
CA:	Central Asia
CAEAS:	Central Asia Engineering Accreditation Standards
CANQA	Centrals Asian Network for Quality Assurance
CTI:	(France) Commission des Titres d'Ingénieur
EAFS:	EUR-ACE Framework Standards
EE:	Engineering Education
EHEA:	European Higher Education Area Education.
ENAEE:	European Network for Accreditation of Engineering Education
EQF:	European Qualification Framework
EU:	European Union
EUR-ACE:	EURopean ACredited Engineer
HE:	Higher Education
HEI:	HE Institution (e.g. University)
QA:	Quality Assurance
QUEECA	Quality of Engineering Education in Central Asia, www.queeca.eu.
RAEE:	Russian Association for Engineering Education (now AEER: Association for Engineering Education of Russia)