

Engineering Education in Poland, KAUT Road to EUR-ACE® System

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Summary

The paper described the Higher Education System in Poland mainly in the area of engineering. The history of the Accreditation Commission of Universities of Technology (KAUT) and Polish Accreditation System is also given. KAUT accreditation system and accreditation procedures are given in details. KAUT application and two years road to the EUR-ACE® System is described.

1. System of Higher Education in Poland

The higher education system in Poland is regulated by the Law on Higher Education [1]. Following political changes at the beginning of the 1990s, the universities in Poland were given wide autonomy that resulted in a rapid creation of many private (non state-controlled) universities. In 1990 there was 106 state Higher Education Institutions (HEIs) and 6 private. In 2013 there is 112 state and 325 non-state HEIs. Thus, the number of students has grown from 400 thousand in 1990 to nearly 2 million in 2013. The biggest growth was in the field of humanities, which became the biggest part of the offer of more than 300 newly founded private universities. The number of fields of study has grown up to about 120 plus many unique.

Unfortunately, the engineering and technical students constitute only 13 % of all the students. The Bologna Process started in late 1990 transforming the system from the uniform 5-year model to the two-cycle system with the adoption of all necessary mechanisms (i.e. establishment of a credit point system – ECTS, promotion of mobility of students, teachers, researches and administrators, adoption of a system of easily readable and comparable degrees, promotion of European cooperation in quality assurance, promotion of a European dimension in higher education with regards to curricula development, inter-institutional cooperation, mobility schemes and integrated programmes of study, training and research, implementation of the qualification frameworks in the EHEA based on learning outcomes).

The National Qualification Frameworks were developed in Poland in 2011. The learning outcomes descriptors fit the qualification descriptors described in European and national documents such like:

- Qualifications Framework for EHEA (Dublin Descriptors).
- Qualifications Framework for Long Life Learning.
- National Qualifications Framework (for Poland).

In terms of the wide Engineering Sector, a number of relevant initiatives can be identified, again driven by different objectives and hence with somewhat different structures:

- EUR-ACE[®] (EUROpean ACcredited Engineer Project) framework for accreditation of engineering programmes.
- ABET (Accreditation Board for Engineering and Technology, USA).
- CDIO (Conceive-Design-Implement-Operate initiative).
- JABEE (Japan Accreditation Board for Engineering Education).
- IEA (International Engineering Alliance).

2. History and development of the KAUT

The Accreditation Commission of Universities of Technology (KAUT) was appointed on 17 February 2001 by the Conference of Rectors of Polish Universities of Technology (KRPUT) under the " *Agreement to Ensure the Quality of Education*" [2].

The *Agreement* introduced a voluntary accreditation system in which all engineering-specific programmes are encompassed. All matters related to the activity of KAUT, such as the manner and rules of appointing the Commission, the tasks of the Commission, general and accreditation procedures, are laid down by KRPUT. The *Agreement* was subsequently approved by the Senates [authorities] of all 23 Universities that were the signatories of the *Agreement*.

KAUT is one of the so called branch-specific accreditation commissions that function within the framework of the Conference of Rectors of Academic Schools in Poland (KRASP) and whose activities to monitor the higher education system are regarded by the Rectors as vital and necessary. In Poland there is also the Polish Accreditation Committee (PKA) which is an agency of the Government Administration intended to ensure the compliance with the prevailing regulations by the higher education institutions. PKA is the guardian of the standards understood as the necessary conditions for provision of educational services at the university level, while the branch commissions like KAUT focus on the assessment of these qualities that cannot be assessed by PKA.

Thus the key objective of the branch-specific accreditation is to identify the university units that provide education services at the highest level, i.e. to promote the establishment of the elite of higher education units. Especially now, when the entire higher education system in Poland is undergoing vast changes related to the introduction of the National Qualification Frameworks and the entirely new perception of the education process, branch commissions are the important element in the establishment of the mechanisms guaranteeing its high level. It is then necessary to combine the supervisory nature of PKA with the activities of branch commissions in order to create a "quality culture". The KAUT accreditation should thus become one of the most important promotional elements of the universities.

The areas of KAUT's activities include the following:

- Accreditation of educational programmes,
- Handling of the domestic student exchange programme - MOSTECH,
- Offering support to universities with respect to implementation of the internal and external education quality assurance systems,
- Promoting "best practice" examples and implementing education quality assurance systems at universities.

3. Accreditation Standards and Procedure

The accreditation process is carried out on the basis of educational quality standards. The standards for accreditation are used in the evaluation of programmes and they are expressed in term of requirements and programme outcomes. Apart from general data such as length of duration of studies, number of ECTS points etc., the requirements outline the content of education programme and the qualifications and competences of the graduates.

According to the Law on Higher Education the requirements are “*a set of rules concerning higher studies education offered in different forms within fields of studies and interdisciplinary studies*”.

At each level requirements are defined through characterising *the knowledge*, i.e. the educational contents specific for a given scientific discipline, and the study outcomes specifying *skills and competences*, i.e. defining the activities that a graduate is able to perform, including the specialist, and the universal ones (independent studying, interpersonal communication, team work, etc). Obviously, the requirements are formulated so as not to create over-rigid frameworks and not to result in unifying study curricula for a given field offered at different universities.

The basic component of the evaluation of the institution (unit, faculty) subjected to accreditation is a formal – from the point of view of satisfaction of the **university standards** – and a subject matter evaluation of the training programme with respect to the mission fulfilment and satisfaction of the adopted educational goals (learning outcomes). A model quality standards are prepared for all technical studies accredited by KAUT.

The standards are composed of the primary and secondary attributes. The attributes are in four groups:

- Requirements of the teaching staff,
- Requirements of the study programmes and curricula,
- Requirements of the study system and organization,
- Requirements of the teaching and learning facilities.

The six Programme Outcomes defined in the " EUR-ACE[®] Framework Standards for the Accreditation of Engineering Programmes” are the base for evaluation of the learning outcomes:

- Knowledge and Understanding,

- Engineering Analysis,
- Engineering Design,
- Investigations,
- Engineering Practice,
- Transferable Skills.

The assessment of a particular teaching programme is properly organised, managed and maintained so as to ensure the fulfilment of the assumed learning outcomes, and is carried out in three stages [3].

In the **first stage**, the faculty submitting an accreditation application prepares the assessment within the framework of one of the versions of the self-assessment report related to the current accreditation proceedings.

The second **stage** of the assessment encompasses visitation of the agency by the KAUT Evaluation Team (KET) appointed from among the members nominated by the universities in the secret ballot at the plenary meeting of KAUT. The candidates must be approved by KAUT at a plenary session. KET is composed of the representatives of the universities, employers, students and/or Ph.D. students. The university teaching staff who are members of KET are highly qualified experts in the field of study subjected to accreditation and guarantee performance of reliable assessment with regard to both the subject matter and organisation of the accredited course of studies.

Having analysed the self-assessment report, KET carries out a two or three-day site visit followed by the Assessment Report. Its layout and content are harmonised with the standards applicable to the course of studies concerning the education quality adopted by KAUT.

The Assessment Report prepared by KET includes, among other things, the information concerning the evaluation whether or not a particular programme (curriculum) of the accredited field of study is properly organised, managed and maintained so as to ensure the fulfilment of the assumed outcomes of the programme. The group of primary attributes which must be fully satisfied by the accredited unit and the majority of secondary attributes which determine the possible awarding of the KAUT accreditation for the period of five years.

The Assessment Report prepared by KET before its presentation at a plenary meeting of KAUT, is submitted to the faculty which within 30 days of its receipt may present its comments.

The **third stage** of evaluation of the organisation, management and maintenance of the educational programme ensuring the achievement of the assumed curricula effects is carried out by KAUT at the plenary meeting. Before the meeting all members of KAUT receive a self-assessment report and the Assessment Report of KET. During the plenary meeting, the Chair of KET evaluates and presents in detail the Report and the course of the site visit to KAUT and answers any possible questions. Next, the report of the KAUT reviewer is presented. This is the KAUT member who prepared the report on the base of faculty Self-Evaluation Report, Assessment Report of KET and faculty

comments. The Chair of KET being the person from the outside of KAUT, participates in the subsequent parts of the plenary meeting where the discussion takes place. Then the decision to award, deny or delay accreditation is made by KAUT through the secret ballot.

4. KAUT road to EUR-ACE[®]

In December 2010 KAUT prepared and sent to ENAEE application for authorisation to award the EUR-ACE[®] Label.

4.1 The visits and related meetings

The ENAEE Review Team for KAUT (ERT) was nominated by the Label Committee in January 2011, but a visit could not be organized then for several reasons; at the end, it was agreed to hold the first visit in January 2013. Professor Giuliano Augusti was nominated the Chair of the ERT.

- **(21-22 January 2013): Attendance at the KAUT Evaluation Team (KET) visit of Technical University of Łódź (PŁ: Politechnika Łódzka) – Faculty of Civil Engineering, Architecture and Environmental Engineering.**

Programmes evaluated for accreditation:

Architektura i Urbanistyka – Studia pierwszego stopnia (Architecture and Urban Planning, undergraduate studies, Bachelor - 1st cycle);
Architektura i Urbanistyka – Studia drugiego stopnia (Architecture and Urban Planning, graduate studies, Master - 2nd cycle).

- **(23 January 2013): Visit and Meetings at KAUT Office in Krakow**

Meeting of ERT with representatives of KAUT to clarify several points on KAUT procedures and on the development of the KAUT Evaluation Team (KET) visit to PŁ, Meetings of ERT with the Rector and Vice-Rectors of AGH, the host Institution of KAUT

- **(25 January 2013) Label Committee Meeting, Paris**

The ERT Chairman reported orally on the first ERT visit and proposed the “Candidate Agency” status for KAUT; the Label Committee unanimously supported the proposal, to be submitted to the ENAEE Administrative Council.

- **(12 February 2013) ENAEE Administrative Council, Brussels**

The ENAEE AC granted to KAUT the “Candidate Agency” status.

- **(8 March 2013) Meeting of KAUT attended by the ERT Chair G.Augusti (as a delegate of the whole ERT), Kraków**

The KEC Chair reported orally (the written report is the hands of the participants). The member of KAUT reported orally on the report on the PŁ visit, commented the KET Report and Final Conclusions, and proposed to accept the KET Conclusions and accredit

both 1st and 2nd cycle evaluated programmes for 5 years from 2013/14. The proposal is voted by secret ballot and obtains 14 yes on 14 votes.

- **(10-12 April 2013), Attendance at the KAUT Evaluation Team (KET) visit** of AGH University of Science and Technology, Krakow, Faculty of Materials Science and Ceramics

Programmes evaluated for accreditation:

Inżynieria Materiałowa (Materials Science and Engineering, Bachelor - 1st cycle);
Inżynieria Materiałowa (Materials Science and Engineering, Master - 2nd cycle).

- **(3 June 2013) approval by the EUR-ACE Label Committee**
- **(16 September 2013) ENAEE AC Meeting**

4.2 Some exceptions from the Report of Review Team to EUR-ACE[®] Label Committee

The on-site visit of the ENAEE Review Team for KAUT (ERT) was positive as well as the Report to EUR-ACE[®] Label Committee and we are confident that the process will soon be concluded. Below there are some exceptions from the Report.

4.2.1 Programme Outcomes

The Programme (or Learning) Outcomes (LOs) adopted by KAUT conform necessarily to those established by the Ministry, in turn - as indicated above - based on international Standards, and primarily on the EUR-ACE[®] Framework. The ERT has checked that these LOs (21 for 1st cycle, 20 for 2nd cycle) covered satisfactorily the EUR-ACE[®] Programme Outcomes.

4.2.2 Programme Organisation

The Agency (KAUT) satisfactorily assesses the ways the programmes are organised, managed and maintained in order to ensure that the Programme Outcomes are achieved and that the accreditation procedure requires course providers to provide adequate resources to deliver programmes

4.2.3 Accreditation Procedure

The Agency's accreditation procedures are satisfactory and the Agency documentation provides clear guidance to enable the university to produce a comprehensive self-assessment report and other necessary information. The composition of the accreditation team is adequate, the decision-making process is correct, the decisions are communicated properly and there is an appeals system in place.

The ERT was exceptionally impressed by the professionalism and the quality of the KET for PL, and their ability to conduct meetings with both students and staff in such a way as to create inspiring atmosphere.

The ERT considers it to be necessary to include (as a full member) an "industrialist" (i.e. an external non-academic expert who could act as representative of stakeholders and/or professions) in the KAUT rules and practice. Some of the programmes offered for

accreditation appear not to have sufficient engineering flavour according to the LOs contained in the EUR-ACE[®] Framework Standards.

4.2.4 Activities

The accreditation processes at programme level is the core functions of the Agency.

4.2.5 Independence

All decisions related to the accreditation processes fall within the remit and competence of KAUT, and are not subject to approval by any external body.

4.2.6 Accountability Procedures

Several elements of the procedures guarantee high responsibility standards, including:

- secrecy of the accreditation vote,
- independence of the Expert and Assessment Teams members from the university (school) authorities,
- open nature of the decision,
- publishing of the composition of KAUT.

5. References

1. Act of 27 July 2005 *Law on Higher Education* (Dziennik Ustaw - Official Journal of Laws of 2005, No.165, item 1365, as amended).
2. *Agreement to Ensure the Quality of Education*, resolved by the Rectors' Conference on 17.02.2001, as amended.
3. *Accreditation Rules and Procedures*, passed on 17.02.2001, as amended.

6. Acknowledgment

We would like to express our sincere gratitude to the ERT ENAEE team: Prof. Giuliano Augusti (Chair of ERT), Prof. Clemente Pedro Nunes and Prof. Jan Sykulski for all the effort and commitment during their visits to Polish universities of technology and their work with KAUT Assessment Teams. We would like to pay our utmost respect and gratitude for their comprehensive, in-depth analysis of accreditation procedures used by KAUT. Their numerous remarks and queries have allowed us to identify certain deficiencies in our activity and will surely aid future improvement.