

## ACCREDITATION – DYNAMIC PROCESS OF QUALITY ASSURANCE IN EDUCATION

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**Abstract** – In the paper the problem of changes in engineering education is discussed. On the one hand there are precisely defined general academic standard for accreditation, on the another one there are job market expectations. To follow the expectation of graduates and employers faculties must introduced continuous improvement process based on outcomes measurements. The close loop self assessment process as a part of accreditation procedure is discussed.

**Index Terms** – Accreditation, self assessment process, engineering education

### Engineering Education

Engineering education must follow rapid diffusion of information, new technology and economy. That means that curriculum ought to be flexible and faculties must care for it. University must move from a model of teaching to one of facilitating learning.

It become clear if we look for typical interview. The employers underline, that everyone can learn any job by continuous study, if he/she:

- Is graduated.
- Wants and can learn quickly.
- Can works as independent worker and solves problems
- Is interested in work and loyal to employer.
- Is young, but has some professional experience.
- Knows foreign languages.
- Can easily comes into contact with others.
- Is skillful with computers.
- Is disposal

Let us pay attention that at the first place is higher education in general. The notable part of employers says that studies can't prepare graduates to work on precisely definite position. From above-mentioned follows, that employers expect from *employ*, which has universities diploma to quickly master new job, loyalty and independent work. They can also make easier getting constant professional training for the *employees* by organization special courses or/and paying for organized by some one else. That can be very big chance for graduates and shows necessity of joining to life long learning.

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### Accreditation Models

In typical accreditation procedure the general academic standards define: curriculum, program, faculty, facilities, administration and operation. Based on this parameters it is possible to see if institution fulfill general standards. In this case we can look only for license which is given by government. The license is given by periodic monitoring of general academic standards – monitoring of inputs in education institutions (Figure 1).

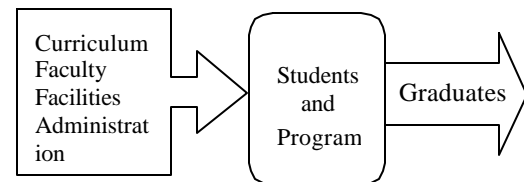


Figure 1.  
Academic standards monitoring – open loop accreditation model

In this model usually it is reviewed if:

#### Curriculum

- is balanced of general education (i.e. mathematics, science and engineering courses),
- gives preparation for technology practice,
- has appropriate engineering and technology standards,
- has appropriate sequence of courses,
- has industrial aspects.

#### Faculty

- has sufficient number of staff competent to cover curriculum areas,
- ensure program guidance, assessment and development.

#### Facilities

- if modern engineering tools are available,
- if adequate classrooms, laboratories and equipment are available,
- if computing and information infrastructure exists.

#### Administration

- constructive leadership
- financial resources
- technical and clerical service

The above model does not take into account student and employers expectations. To speak about real accreditation almost one graduates must exist and must find a job. In accreditation procedure also opinion of employers must be taken into account. Besides of academic standards both students and employers [5] are looking for another criteria as: ability to solve problems, ability to use theory in practice, team working, self-control and self-evaluation, strategic thinking, realization of complex project. The above features could not be monitoring a priori. They may be observed as outcome measurements of program realization (Figure 2.).

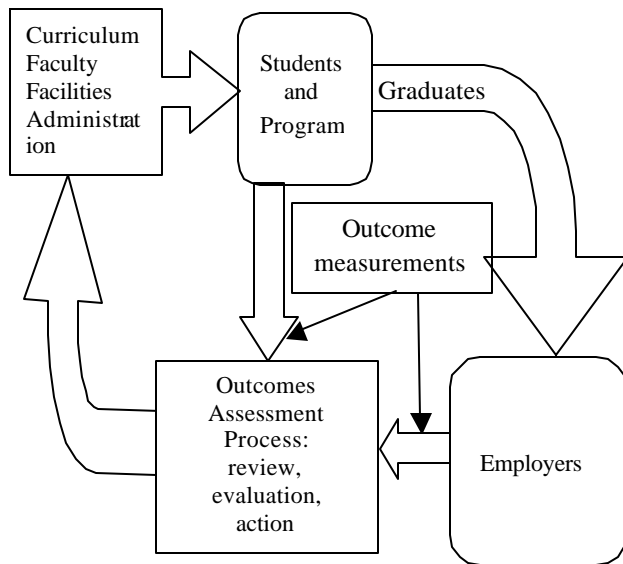


Figure 2

Academic standards monitoring and outcome assessment process – close loop accreditation model

Now the most important problem is to define outcomes measurements. The expectation of graduates and employers are similar. The graduates should demonstrate:

- an ability to identify, formulate and solve problems appropriate to the discipline,
- an ability to apply knowledge (mathematics, science, management, technology) in problem solving,
- an ability to design experiment and analyze and interpret data,
- an ability to use modern techniques and tools in practice.

The also important features are:

- knowledge of ethical and professional responsibilities
- understanding of the impact of engineering for modern science,
- an understanding of importance and commitment to life long learning,
- communication skills and team work.

To obtain the mentioned features it is necessary to review the program of study. The following programs objectives are usually listed:

- Provide education necessary to enter and succeed in the professional career.
- The program must motivate students and graduates to develop knowledge beyond graduation.
- Developed both theoretical and practical skills of graduates.
- Provide up-to-date instructions in the professional area.
- Encourage research and creative endeavors.
- Possibility to obtain professional license.

### Final remarks

Engineering education must follow fast changes in science and technology. Also the context of international changes is important. Engineer becomes role of integrator, manager, leader and innovator. The context of engineering education includes economic, social factors based on good scientific background. In this context the engineering education system must look for new solution. The universities programs must be much more flexible, but still offer education on the respective level. The traditional open loop system of accreditation is focused only on the general academic standard - input measurements. Looking for new solution – the only possibility to obtain high level is to introduce close loop system which contains self-assessment process. This new accreditation philosophy is less restrictive concerning detailed quantitative requirements and provides more flexibility in designing of program and its objectives. Accreditation becomes an evaluation of the dynamic process of quality assurance in education.

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