Engineering Education in Kazakhstan

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Professor of Eurasian National University
Based on the new course "Kazakhstan-2050" President of the Republic of Kazakhstan Nursultan Nazarbayev has instructed the Government:

- to create in pilot regime a several independent centers of the confirmation of qualifications on the basis of industry associations;

- to ensure the development of modern engineering education and technical specialities with assignment of international certificates at 2013;

- in 2014 to begin development of a system for Engineering Education.
Strategy «Kazakhstan-2050»
new political course of the established state

- From the Address of the President of the Republic of Kazakhstan

«... the key reference points of a modern system of education, training and retraining of personnel - is the knowledge and the professional skills»

What?

Higher Education System: New Challenges and Trends

How?

International Trends in Engineering Education
International Trends in Higher and Engineering Education

- From the Bucharest Communique
- 2012, April 26-27

Quality Assurance of Higher and Engineering Education

- Optimization of Universities
- Development of Systems of Training and Further Training of Teachers
- Development of the Engineering Education
New Classification of Universities

- National Research Universities
- National Universities
- Research Universities
- Universities
- Academies
- Institutes

5 National и 15 Engineering Shared Labs
International Trends in Higher and Engineering Education

- From the Bucharest Communique
- 2012, April 26-27

Quality Assurance of Higher and Engineering Education for All

Increasing Access to the Higher and Engineering Education

Every year around the world more than 150 million people goes to universities

Accessibility of higher education in some countries up to 80%
Accessibility of Educational Services / Education

Number of Education Organizations

- Pre-school Education and Learning
  - 2011: 7,591
  - 2012: 8,392
  - Realization of the Program «Balapan» + GBP

- General Secondary Education
  - 2011: 7,696
  - 2012: 7,698
  - Optimization

- Technical and Professional Education
  - 2011: 896
  - 2012: 888
  - on 8 units

- Higher and Postgraduate Education
  - 2011: 146
  - 2012: 139
  - on 7 units

Number of Students

- Pre-School Education
  - 2011: 631,489
  - 2012: 629,507

- Common Sec. Education
  - 2011: 538,527
  - 2012: 600,751

- Techn. & Prof. Education
  - 2011: 2,493,479
  - 2012: 587,310

- Higher Education
  - 2011: 2,479,044
  - 2012: 571,691
Funding of the Education from the Government Budget

Quality Assurance of Higher and Engineering Education for All

Government Finding for One Person / Student / Education Level/ US Dollars / $

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-School Education</td>
<td>1.26</td>
</tr>
<tr>
<td>Common Sec. Education</td>
<td>1.5</td>
</tr>
<tr>
<td>Techn. &amp; Prof. Education</td>
<td>2.0</td>
</tr>
<tr>
<td>Higher Education</td>
<td>2.3</td>
</tr>
</tbody>
</table>
International Trends in Higher and Engineering Education

Increasing of Competence and Continuing Education

Professional Development, Retraining and Internships of the P&T of the Universities/ person

- Companies: 361
- Research & Study Academies: 172
- Foreign Universities: 558
- Universities of RK: 1711
- Industry Centers: 281

Professional Development, Retraining and Internships of the Engineers and Teachers of the Technical & Professional System / person

- Companies: 1000
- Company “Orleu”: 300
- Abroad: 164
- Project “Modernization of T&PE”: 700
### International Trends in Higher and Engineering Education

**Increasing of Employment and Employability of Students and Engineers**

**% Employment of Graduates with Engineering Education**

<table>
<thead>
<tr>
<th>University Category</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>89,6</td>
<td>93,1</td>
</tr>
<tr>
<td>International</td>
<td>60,9</td>
<td>54,2</td>
</tr>
<tr>
<td>State</td>
<td>87,9</td>
<td>88,2</td>
</tr>
<tr>
<td>Corporatized</td>
<td>79,5</td>
<td>93,2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>84,0</strong></td>
<td><strong>87,8</strong></td>
</tr>
</tbody>
</table>

Dynamics of Graduate Employment of Undergraduate

![Graph showing the increase in employment from 2011 to 2012](graph.png)
Academic Mobility of the Students

- Academic Mobility Strategy in the Republic of Kazakhstan for 2012 - 2020 years

- Institutional Strategies for Internationalization of Higher Education

For 2012-2013 academic years:
For the international academic mobility of students is given
$34,000
### International Trends in Higher and Engineering Education

#### Academic Mobility of the Students

<table>
<thead>
<tr>
<th>Universities</th>
<th>Undergraduate</th>
<th>Master</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011</td>
<td>2012</td>
</tr>
<tr>
<td>National</td>
<td>44,0</td>
<td>33,3</td>
</tr>
<tr>
<td>State</td>
<td>15,0</td>
<td>24,0</td>
</tr>
<tr>
<td>Corporatized</td>
<td>68,7</td>
<td>62,5</td>
</tr>
<tr>
<td>Total</td>
<td>34,0</td>
<td>36,0</td>
</tr>
</tbody>
</table>

There are Universities, which are implementing two degree programs.
### Quality Assurance in Engineering Education

**From the State Program of Education Development of the Republic of Kazakhstan for 2012-2020 years**

<table>
<thead>
<tr>
<th>Universities, which have a national institutional accreditation according to international standards</th>
<th>to 2015</th>
<th>to 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>65%</td>
</tr>
</tbody>
</table>

| Universities, which have a national specialized accreditation by international standards | 20%     | 30%     |
International Trends in Higher and Engineering Education

National Register (of Accreditation Centers)

Independent Accrediting Agency and Ranking (NAAR) (2011, SC)


Accreditation Board of Engineering and Technology (ABET) (USA)

Institute for Accreditation, Certification and Quality ACQUIN (2001, Germany)

Accreditation Agency for programs of engineering, computer science, natural sciences and mathematics ASIIN (2002, Germany)
Kazakhstan in the World Educational Space

- Tertiary education enrollment
- Internet access in schools
- Secondary education enrollment
- University-industry collaboration in R&D
- Quality of the education system
- Quality of primary education
- Quality of math and science
- Primary education enrollment
- Quality of management schools

Kazakhstan in the Global Competitiveness Index (GCI)

- 2012
- 2011
- 2010
- 2009
- 2008
International Trends in Higher and Engineering Education

National System of Qualifications

- **National Qualifications Framework**
  - is compatible with the European Framework of Qualifications
  - is continued to be a self-certification

- **Industry Qualifications Framework**
  - is developed in the field of education and science, labor, agriculture

- **Professional Standards**

- **Independent Certification Centers**
International Trends in Higher and Engineering Education

Factors that Contribute to the Need Establishing National System of Certification and Registration of Professional Engineers in Kazakhstan:

National System of Qualifications

- Globalization of the economy and education
- Kazakhstan's integration into the world economic and scientific-educational space
- The increasing role of the engineer
- The need to improve quality of engineering education
- Three levels of education
Accreditation of the Education Programs in the Kazakhstan
International Trends in Higher and Engineering Education

There are Several Social Organizations in Kazakhstan. They are solving problems of increasing the quality of engineering education.

National System of Engineering Qualifications

- National Academy of Engineering of the Republic of Kazakhstan
- National Academy of Sciences Graduate School of Kazakhstan
- Association of the Kazakhstan Universities
- Association of Professional Education of the Kazakhstan
- Kazakhstan Monitoring Committee (IGIP)
- Kazakhstan Association of Engineering Education (KazSEE)
It was established in the June 2007

The Association was established at the Seminar - Meeting of University Rectors.

Kazakh Society of Engineering Education was included in an International Consortium Society for Engineering Education.
## International Trends in Higher and Engineering Education

### The structure of Kazakhstan Society of Engineering Education

<table>
<thead>
<tr>
<th>Affiliated Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astana</td>
</tr>
<tr>
<td>Aktau</td>
</tr>
<tr>
<td>Pavlodar</td>
</tr>
<tr>
<td>North-Kazakhstan</td>
</tr>
<tr>
<td>Kzyl-Orda</td>
</tr>
<tr>
<td>West-Kazakhstan</td>
</tr>
<tr>
<td>Kostanai</td>
</tr>
<tr>
<td>Karagandy</td>
</tr>
<tr>
<td>Aktyubinsk</td>
</tr>
<tr>
<td>Ust-Kamenogorsk</td>
</tr>
<tr>
<td>South-Kazakhstan</td>
</tr>
<tr>
<td>Dzhambul</td>
</tr>
<tr>
<td>Atyrau</td>
</tr>
</tbody>
</table>
International Trends in Higher and Engineering Education

The Regional Structure of KazSEE: For Development of Engineering Education
International Trends in Higher and Engineering Education

Mission of the Kazakhstan Association of Engineering Education

National System of Engineering Qualifications

- Improving of engineering education;
- Development engineering activities in all directions: educational, scientific and technological;
- Development of the teaching, counseling, research, development, engineering solutions and technology transfer;
- Providing a wide range of educational services;
- Providing public relations, production, science;
- Integration into the international scientific and educational space.
Training and certification of teachers of engineering universities in centers, accredited by the European Society for Engineering Pedagogy (IGIP).

Certification and registration of Kazakhstani professional engineers, contributing to the international registries.

Accreditation of educational programs in engineering and technology, with the support of ENAEE AEER.
KazSEE was included in an International Consortium of Engineering Education Societies (IFEES) in 2007.
Memorandum of Cooperation Between ENAEE, AOIR and KazSEE

Collaborate on training in Kazakhstan personnel with higher education, specializing in engineering and technology

- Development of professional accreditation of educational programs in engineering and technology in Kazakhstan
- Development of international contacts and relations of Kazakhstan Engineering Universities
- Promoting the integration of Kazakhstan higher technical educational institutions in the international scientific and educational space.
ENAEE consists of Germany, France, England, Ireland, Italy, Portugal and other countries.
In 2013 KazSEE was entered to the European Federation of National Engineering Communities (FEANI).

This is facilitate to the registration of specialists in the field of engineering and technology, accredited standards-based Euro-Ace, in FEANI Register.
International Trends in Higher and Engineering Education

RESULTS OF LEARNING, EDUCATION WITHIN LIVE

Formal Education (all levels of Education)

Informal Education

Informal Education

Results of education

Recognition of qualifications for higher education

Higher Education

Results of Education

Recognition of qualifications

Labor market

Value for the learning outcomes and recognition of qualifications in the context of interaction of the education market and the labor market
Strategy «Kazakhstan-2050» new political course of the established state

• From the Address of the President of the Republic of Kazakhstan

Priorities of the Higher Education Development of the Republic of Kazakhstan

... development of modern engineering education and technical specialties with assignment of international certificates

... active participation in large-scale international research projects
THANK YOU FOR ATTENTION!

THANK YOU FOR COOPERATION!