Triangle of Knowledge in the Nuclear Energy

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Content

- Analysis
- An abstract scheme
- Nuclear Knowledge Triangle (NKT) challenges
- Requirements for the functioning of the knowledge triangle
Ideal nuclear knowledge triangle

EDUCATION
- Universities
- Training centers

RESEARCH
- Scientific Institutes,
- Academy of Sciences,
- Research departments at universities,
- Research and development organizations
- Private Research Institutions/Laboratories
- Research and Development Departments in Enterprises

INNOVATION
- Enterprises,
- Innovation Associations
- Know how Transfer Institutions
- Institutional Support of founders of new business and start ups

3 nuclear knowledge spheres must be integrated

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IDENTIFICATION

• Angles content
• Contribution of research to academic education
• Contribution of research to innovations
• Interactions between Academic Education and Innovation
• Interactions between Academic Education and research
Interactions between Research and Academic Education: Potential Outputs

- **Research**
  - number of latest research results included into academic education,
  - extent of methodological knowledge included into academic education,
  - extent to which research institutions have got a real impact on the definition of qualifications the graduates of academic education should achieve,
  - impact on the definition of fields of research of post-graduates at higher education institutions and number of research projects supported at higher education institutions
  - ...

- **Academic Education**
  - Number of graduates and post-graduates entering a job in research institutions,
  - Extent to which curricula are adapted to new research results and new methodological knowledge
  - ...
Interactions between Research and Innovation: Potential Outputs

- **Research**
  - Extent to which new research results are transferred to (private) enterprises,
  - Extent to which methodological knowledge is transferred to (private) enterprises,
  - Extent to which research institutions carry out testimony services for (private) enterprises,
  - …

- **Enterprises**
  - Extent to which enterprises define subjects/fields of research and order research services at research institutions/higher education institutions,
  - Extent to which research results are checked according to their economic potential,
  - Number of research results with economic potential that are adopted for product development,
  - …

- **Transfer Institutions**
  - Extent to which transfer institutions are working as a „know-how brokers“ between research institutions and enterprises,
  - …

- **Institutional Support of founders of new business and start ups**
  - Extent to which starbusts out of research institutions institutions are supported,
  - Extent to which founders of new business are counseled according to legal, administrative and entrepreneurial questions,
Interactions between Academic Education and Innovation 1: Potential Outputs

- **Academic Education**
  - Extent to which requirements of enterprises are integrated into academic curricula,
  - Extent to which graduates are meeting the scientific requirements of enterprises,
  - Extent of cooperation with transfer institutions,
  - Number of students and post-graduates that are motivated to start their own business,
  - …

- **Enterprises:**
  - Extent to which requirements (hard skills, soft skills) on future experts and managers are communicated to higher education institutions,
Interactions between Academic Education and Innovation 2: Potential Outputs

- Transfer Institutions:
  - Extent to which transfer institutions are working as „know-how brokers“ between higher education institutions and enterprises,
  - ...

- Institutional Support of founders of new business and start ups:
  - Extent to which start-ups out of higher education institutions are supported,
  - Number of seminars on founding new business provided to students and graduates,
  - Extent to which founders of new business are counseled according to legal, administrative and entrepreneurial questions,
  - ...

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INTERACTION

- University + Company = joint laboratory
- University + Enterprise = branch of the department
- University + Enterprise = education center
- University + Research institution = branch of the department
- University + Research institution = joint laboratory
NKT challenges

• Increasing the operating reliability and safety of nuclear power plants by accelerating the transfer of knowledge and experience in NKT;
• Sustainable development of innovation on the basis of the effective transfer of knowledge, generating new knowledge, preservation and restoration of existing knowledge and use of knowledge for NKT entities;
• Reducing the risk of loss of knowledge in the nuclear industry organizations;
• Increasing the level of responsibility and control, based on the rapid development of approaches to identify sources of dual-use and limit their use in the military sphere;
• Supporting the modernization of the education system;
• Supporting improving the quality of higher education;
NKT challenges

• Increased educational opportunities for universities, the ability to modernize;
• Support for human resources development;
• Improving the efficiency of human resources based on accelerating the exchange of new ideas and ways to solve problems, generate new ideas and provide an opportunity to solve problems in the shortest possible time;
• Creation and development of contacts between educational and research institutions; and between educational institutions and industrial organizations;
• Support promotion of nuclear knowledge;
• Sharing the benefits of peaceful applications of nuclear science and technology.
Requirements for the functioning of the knowledge triangle

1. Developing mutual requirements for the integration;
2. Identifying the factors (organizational, legal) that prevent the functioning of the triangle;
3. Creating an information environment to combine NKT entities in real time (common internet portal, a computer network).
Thank you!

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