



Dear readers!

The present issue of AEER journal is devoted to interdisciplinarity in engineering education.

Interdisciplinarity is a complicated notion which implies not only congregative character of activities performed to solve a particular task, but also the transfer of methods, ideas, and paradigms between different spheres (disciplines). Interdisciplinarity is essential when we use problem-based and practice-oriented approaches to solve scientific and engineering tasks, to overcome social, economic and political challenges. It is interdisciplinarity that makes it possible to obtain unique results, and even more, to set new goals, develop and implement competitive solutions, create and promote competitive products.

Interdisciplinarity as a trend in engineering education has been developing over the past decades. Today, interdisciplinary, as well as fundamentalism, internationalization, social responsibility, and sustainable development, is an urgent issue for most of the developed countries. The case in point here is project-based learning.

As a term, interdisciplinarity is described in numerous reports and overviews but often fails to be implemented in real education system. That was the reason to organize a network international conference devoted to interdisciplinarity in engineering education. The conference was initiated by AEER, Kazan National Research Technological University (rector G.S. D'yakonov; first vice-rector, member of the AEER Administrative Board, prof. V.G. Ivanov), and National Research Tomsk Polytechnic University (rector, vice-president of AEER, prof. P.S. Chubik). This initiative was eagerly supported by Gazprom (general sponsor), the Ministry

of Education and Science of the RF, and the universities of Russia and Kazakhstan – Gubkin Russian State University of Oil and Gas (rector, vice-president of AEER, prof. V.G. Martynov), Don State Technical University (rector, member of the AEER Administrative Board, prof. B.Ch. Meskhi), Irkutsk National Research Technical University (rector, director of AEER Irkutsk Branch, prof. A.D. Afanas'ev), Saint-Petersburg State Electrotechnical University «LETI» (rector, member of the AEER Administrative Board, prof. V.M. Kutuzov), D. Serikbayev East Kazakhstan State Technical University (rector, prof. Zh. K. Shaimardanov).

The conference co-organizers were international organizations, which are the most authoritative in engineering education: the International Federation of Engineering Education Societies (IFEES), European Society for Engineering Education (SEFI), International Society for Engineering Education (IGIP).

http://aeer.ru/ru/conf_irkutsk.htm

The scope of the conference included a range of issues concerning implementation of interdisciplinarity in engineering education.

The most essential and successful cases of interdisciplinary principles implementation are as follows:

- interdisciplinary departments and laboratories (for instance, departments of manufacturing and medicine electronics, biophysics, the laboratory of computational linguistics, etc.);
- interdisciplinary courses (“Mathematical Methods in Economics”, “Molecular Physiology”, “Materials Science for Medicine”);
- interdisciplinary research (for instance, automated control systems in social sphere, etc.).

Interdisciplinarity implemented in science, education, and engineering also implies training for work in interdisciplinary teams and on interdisciplinary projects, and these aspects used to be beyond the scope of experts' attention. Which competencies are essential for a university professor to provide the necessary training?

Which requirements should university top managers and heads of departments meet to implement such training?

Another important issue is how to recognize a prospective interdisciplinary project manager. What requirements should the manager meet? Which personal qualities should the manager possess? What are the criteria and tools to identify the professional with relevant competencies? How to ensure the development of such competencies?

Today, it is particularly important for students to participate in real interdisciplinary projects implemented by the prospective employers. How to ensure such participation?

To sum up, there are more questions than answers, and the above-mentioned international conference is supposed to clarify the situation and give necessary recommendations on the perspectives of interdisciplinary implementation in engineering education.

Some of the materials published in this issue were presented at the network international conference “SYNERGY”. We hope they will not only help to find the answers, but will also initiate further research in this challenging field.

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