

042

Opportunities and Challenges in the Implementation of the Knowledge Triangle

E. Sjoer¹

Department of Technology, Policy and Management
Delft University of Technology
Delft, the Netherlands
e.sjoer@tudelft.nl

B. Nørgaard

Department of Development and Planning
Aalborg University
Aalborg, Denmark
bente@plan.aau.dk

M. Goossens

Director, member of the Executive Committee
European Society of Engineers and Industrialists (SEII)
Brussels, Belgium
seiiimg@abuco-consult.com

Conference Topic: Continuing Engineering Education and Lifelong Learning, University-Business Cooperation

Keywords: Knowledge Triangle, Triple Helix, Innovation, PhD graduates in industry

The Knowledge Triangle (KT), introduced by the Lisbon Agenda at the dawn of the 21st century, links together Research, Education and Innovation, mainly from the point of view of University. It replaces the traditional “one way” flow of information, from research to education and from educators to students, by a “both ways” circular motion between the three corners of a triangle which, besides research and education, also includes innovation, the “poor relation” of many European universities.

However, implementing the KT – a focal point in the seven flagships in the Europe 2020 strategy – is easier said than done. This paper aims to identify the processes that should be implemented so that the KT as a conceptual tool changes into a reality in the field. In order to do it, the authors refer to an approach presented last May the 18th by GOOSSENS and SJOER for the World Conference on Continuing Engineering Education in Valencia [1].

Following on what they presented one year ago at the SEFI Annual Conference in Lisbon [2] they propose to extend the aforementioned approach to the innovation process itself and make use of it in order to explain the drivers and barriers that the implementation of the Knowledge Triangle encounters in real life practice.

¹ Ellen Sjoer, e.sjoer@tudelft.nl



The main research question is: “*What are the central issues in implementing the KT?*”. In this paper, the authors try to answer that question on the basis of three cases linked with the three corners of the KT.

In the **first case**, students from Delft University of Technology have been consulted on their ideas about implementing the KT: the effect on the quality of education, how it could become a reality and to what extent they consider themselves able to contribute to innovation. It appeared that their mental model of what innovation means is short of practical information about their future work in industry, but also that they want to contribute to it. Therefore, university, with the help of the KT as a conceptual tool, has to introduce other forms of education and learning methods, based on a successful cooperation with their future professional world.

The **second case** presents the perspective of the academic staff – supposed to act as an initiator and facilitator of the collaborative process of knowledge transfer and development – through the experience of Aalborg University with Problem Based Learning (PBL) as the educational approach for continuing education. The results were clear: though the academic staff know how to facilitate learning processes, they cannot find a good enough reason for getting involved in CE activities, which may very well be due to the lack of incitement structure towards those activities.

And finally, the **third case**, linked with industry, presents a survey of the career perspectives that are being offered by industry to PhD graduates in engineering [3]. It appears that there is an important gap between the views of universities on how PhD graduates have to be prepared for working in industry and the expectations of industry for hiring PhD graduates. Some of the reasons explaining such a gap have been found and are discussed, partly on the basis of the aforementioned approach.

In **conclusion**, the main barriers to implementing the KT lie in the gaps between the different mental models that people – and, by a loose coupling phenomenon, their organizations – have of their respective and reciprocal tasks, objectives and working processes. The Knowledge Triangle is directing to a ‘commitment’ of all stakeholders, so that they should carry through more successful innovation with different partners. This in turn should better satisfy their needs and induce them to change their mental models. Nevertheless, in order to initiate the process, it is necessary to raise among them the awareness of the need of implementing the KT (drivers) and of the dangers of not implementing it (barriers). ■

REFERENCES

- [1] Goossens, Marc and Sjoer Ellen (2012), “*Expanding the concept of Knowledge Triangle to foster the working of the Triple Helix Model*”, IACEE World Conference on Continuing Engineering Education, UPV, Valencia, 16–19 May 2012
- [2] Sjoer Ellen, Nørgaard Bente and Goossens Marc (2011), “*Implementing Tailor-made CEE in theory and in practice: the Knowledge Triangle as a Conceptual Tool*”, SEFI Annual Conference, Lisbon, 27 – 30 September 2011
- [3] Goossens, Marc (2012), “*What career in Industry for Engineers with a PhD ?*”, CLAIU-EU Annual Conference on “*The Engineering Doctorate*”, Madrid, 9 – 10 February 2012