



## The 'Grand Challenges' of the Triple Helix

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Recent decades have seen a shift from an earlier focus on innovation sources confined to a single institutional sphere, whether product development in industry, policy-making in government or the creation and dissemination of knowledge in academia, to the interaction among these three spheres as the source of new innovative organisational designs and social interactions. This shift entails not only various mechanisms of institutional restructuring of the sources and development path of innovation, but also a rethinking of our main models for conceptualizing innovation, including innovation systems (national, regional, sectoral, technological, etc.) and the Triple Helix.

The concept of the Triple Helix of University-Industry-Government relationships interprets the shift from a dominating industry-government dyad in the Industrial Society to a growing triadic relationship between university-industry-government in the Knowledge Society. The concept has grown into an analytical framework for exploring the complex dynamics of the Knowledge Society and for informing policy-makers at national, regional and international level in the design of new innovation and development strategies. In this framework, innovation is seen as a result of interactions within and between University, Industry, Government institutional spheres, with University shifting from a secondary to a primary institutional sphere and an equal partner to Industry and Government, even taking a lead role in implementing innovation. Concepts like 'entrepreneurial university/scientist' and 'third mission' have also been proposed to capture the new role of University in commercialisation of research and involvement in local socio-economic development.

The Triple Helix concept is now widely spread all over the world. To give just a few examples, one can mention the Swedish Governmental Agency for Innovation Systems VINNOVA, which devotes an important part of its activities to stimulating the cooperation between firms, universities, research institutes and other Swedish innovation actors - a mission adopted in the early 2000s, shortly after the agency's inception, and achieved through, among others, the VINN Excellence Centres and the VINNVÄXT Programme. Brazil's 2004 Innovation Law incentivizes the interaction between firms, public universities and research centres, allows grants to innovative firms, the set-up of private firms' incubation facilities in public universities and the shared use of university infrastructure. University-industry-government cooperation has a central role also in European Union (EU) innovation policies, such as the *Innovation Union* flagship initiative of the *Europe 2020* Strategy, and is perceived as a solution to the "innovation emergency" that Europe now faces. The European Regional Development Fund and the European Social Fund allocate significant funding for these objectives and several EU initiatives have been designed for this purpose, such as the European Union Business Forum, the Knowledge partnerships, the European Institute of Technology (EIT), the Knowledge and Innovation Communities (KICs), the Erasmus for All programme and the Agenda for Modernisation of Europe's Higher Education.

The concept of 'grand challenges' facing the EU and the world has been defined by the Lisbon Treaty and took a formal shape in the Europe 2020 Strategy, referring to global warming, energy supply and security, poverty, water scarcity and quality, food supply and quality, ageing society, public health, international terrorism and changes in the world economy, all with significant social, economic and environmental implications. There is a wide consensus on the key role that science, technology and innovation play in addressing the grand challenges, and on the need to

adopt an integrated approach to this end, going beyond specific sectors, institutions, technologies or policy domains.

In a similar way, one could think of the Triple Helix facing its own 'grand challenges', arising from shifts from older models or practices to new ones that reflect the increasing complexity and difficulty in solving social and economic problems of our time. Here are just a few of what I think are the most significant, especially at the regional level, where Triple Helix interactions are the most relevant:

- Shift from a poorly differentiated regional innovation potential to the 'smart specialization' of regions, in order to identify specific regional competitive advantages and invest in their development;
- Shift from competing regions (zero-sum game) to collaborating regions (win-win, value creation game), creation of regional consortia to combine and amplify strengths, identifying 'local champions' and leaders to promote and manage the change;
- Shift from a traditional exogenous development strategy, attracting subsidiaries of multinational companies to the region to boost development, to an endogenous one, based on local capacity-building and investment in local talent and infrastructure;
- Shift from innovation as a firm-specific process (especially to large firms) to innovation as a complex process, involving also SMEs and a multitude of other stakeholders, and having social and cultural implications (education, employment, health, etc.)
- Shift from mono-disciplinary research, single occupations and linear professional development to multi/interdisciplinary research, hybrid occupations especially at the University-Industry interface, non-linear professional development and career flexibility;
- Shift from closed to open innovation systems, networks, clusters;
- Shift from strong top-down innovation strategies to increasingly important bottom-up strategies and partnerships, and the co-existence of the two.

Possible solutions to the 'grand challenges' of the Triple Helix cannot be envisaged without a better understanding of the dynamics of these interactions. How do the University, Industry and Government institutional spheres actually collaborate, what kind of relationships are established during the collaboration and what are their drivers? How is the collaboration evolving over time? Are these partnerships only dependent on specific projects and lasting as long as the project life, or once established, they can lead to long-lasting collaboration based on knowledge-sharing, common goals and vision? Can Triple Helix strategies be compared, at regional/national level, and how to disseminate good practice be most effectively? What can be considered as successful outcome of the interaction (e.g. in light of the debate on the loss of academic freedom and 'privatisation' of research through commercial science)? How to define better Triple Helix indicators to quantify and monitored the interaction?

While the theoretical aspects of Triple Helix interactions have been broadly explored in recent years, their practical value is only at the beginning of realizing its potential. In order to achieve that, the Triple Helix, especially in its systemic perspective, must move away from being a more or less sophisticated academic concept to being a 'building block' of every day's innovation policy and practice. Triple Helix Systems have the capacity to provide solutions to current major challenges in higher education, R&D, competitiveness, labour market, by better training students and researchers, creating more and better jobs, ensuring a sound and sustainable economic growth and solving structural problems arising from the shift from the Industrial Society to the Knowledge Society. In all these endeavours, collaboration is essential, as there's no country for lone riders!

If you want to encourage the development of Triple Helix interactions in your country, we welcome applications for the establishment of a **national Triple Helix Association Chapter**. We also encourage you to become a **Triple Helix Association member** and enjoy a broad range of individual and institutional benefits! All details about membership, chapter application procedure and activities are available on the Triple Helix Association website <http://www.triplehelixassociation.org>. For further information please contact me at [marina.ranga@stanford.edu](mailto:marina.ranga@stanford.edu).