

Higher Education Quarterly (HEQ)

Special Issue

Policy Turnaround: Towards a New Deal for Research and Higher Education. Governance, Evaluation and Rankings in the Big Data Era

Editorial

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1. Introduction

What is happening to our society? Why, while we are at an historical apex in terms of material wealth produced in the world, as well as of population living on the planet, at a time of the fourth revolution (the information revolution, Floridi, 2014) led by the rapid development of Information and Communication Technology after subtracting billions of people from hunger; why are we looking at the future with such a growing concern? And why is this particularly true for those very areas, in Europe as in the United States, that are showing wealth levels previously unrecorded in human history?

We are not asking ourselves these questions with the illusion to provide a complete answer in a few papers; but rather because we want to begin a reflection, and provide a jolt in the public opinion, such that we can look to the future with renewed confidence. Starting from a belief and acknowledging an important fact.

The belief is that a great merit for the welfare achieved by humankind lies in the knowledge gained through scientific research in all fields, starting from the industrial revolution and perhaps even earlier, with the Renaissance. Merit also lies in education, to the highest levels, as it has become a mass phenomenon with hundreds of millions of people enrolled in universities around the world.

We also need to acknowledge that the growth and wealth accumulation experienced in the past centuries have come to an end, at least in the current reference model, often quantitative, and that what awaits humanity is really an uncharted territory. We are at the beginning of the “Advanced Anthropocene”, when the humankind has the tools to physically dominate the world, but cannot rule over the desires of the communities to which we belong. Perhaps, this is because the answer is no more one based on quantitative and material arguments, at least not prevalently. The tensions and

fears of today's most developed world stem from the awareness of a coming "big bang", to be characterized by demographic decline, efforts to maintain the achieved well-being, awareness of living in a finite world where the wealth tends to be distributed more and more unequally, and where rejection phenomena, which convey in various populism, or in the accumulation of public debt, are what helps understanding that anaesthetic remedies may relieve the pain, but do not solve the disease.

In doing this, we dare a historical comparison with the crisis of 1929, together with the evolution that followed in Europe and the United States, at the time the two true centres of the world, suggesting that even today we need a New Deal, as an injection of hope that starts primarily from research and educational systems.

The necessary actions to affirm the principles and the identity in the world of research and education largely depend on the starting positions. The idea that we need common starting conditions makes of the world of research and education a social vanguard, capable to lead our steps through the difficult period that we are living, following the example of the Roosevelt's United States, rather than those of the dominant countries in those days' Europe.

The reminder of the paper is organized as follows. Section 2 describes the link between the changing needs of today's society and the need of a "New Deal" in Research and Higher Education policy. Last, Section 3 provides an overview of the papers collected in this special issue.

2. Research and Higher Education in today's society

This special issue aims to analyse what types of public policies for science, technology and higher education are necessary for the coming decades, both for individual member states as well as the EU as a whole.

In the twenty-first century, an array of policy challenges arose demanding the kind of broad, sweeping policy reforms reminiscent of the "New Deal" era of a hundred years before (Miller 2010). The current economic crisis is, in fact, not only a crisis of the Western economic model, but it is a structural breaking point in the social, economic, and cultural balance, which calls for a complete reshaping of the social framework (Paleari et al. 2015).

Social challenges are crucially modifying the higher education and science environment. As a matter of fact, the declining birth rate will reduce student cohorts in Europe in the coming decades. At the same time, the worldwide adoption of English as the lingua franca of mutual understanding in international relations (Bernini 2015) not only allows to develop new curricula targeting international students, but also greater access to publication provided for non-native scholars. A further social change regards the exponential growth of academic knowledge due both to the need to focus on more and more specialised research fields, and to the transdisciplinary competences required to solve global challenges. Generally, it is related to the expanding social and economic requests to higher education institutions.

Moreover, important economic challenges are in place. Policy rhetoric stresses that investments in education, research, and science are key drivers to restore economic growth. Over time, higher education institutions have been recognized to provide young people skills and problem solving capabilities, able to foster the development of new jobs in knowledge intensive industries.

In spite of the recognized value of science and higher education and the past experiences in dealing with financial and economic crises, public spending in those areas is not considered as a measure to

contrast the economic crisis. As a matter of fact, public spending is an exception rather than the rule. National budgets, rooted upon domestic political perceptions of local strategic priorities, are key to the understanding of the development of public policies related to science and higher education. Taken together, gross (public and private) R&D expenditure (GERD) in the EU-28 now account for about 2.0% of EU's GDP (while GERD in the US is about 2.8% GDP). However, the quasi stagnation of R&D public investment in Europe during the last decade hides a major trend of internal divergence inside Europe itself. Germany and northern European countries have met the European targets for R&D expenditure, which were set at 3% of GDP (EC 2014), while the average investment in R&D in the other European countries has decreased comparatively to the US. A withdraw of the state as financier is evident mainly in Southern Europe, causing perhaps a brain drain of young generation due to the lack of professional opportunities (Santos et al., 2016) with increased mobility both within and outside Europe. At the same time, following the assumptions of new institutional economics, higher education reforms are developing more competitive mechanism for the allocation of government support to institutions, empowering the users (students) through the tuition fees, tying government support to student choices, and research funding to clearly defined indicators of university output (Dill, 2014) through which European and national policies attempt in fact to specify the outcomes of universities, to regulate their behavior, and to monitor their performance.

Finally, even technological changes are affecting the university and research environment. The declining costs of international travel and information storage, the low cost access to large database in the sciences and social sciences, and the adoption of modular instruction and continuous assessment as primary means of organizing student learning (Dill, 2015) are altering the manner of teaching and learning. Technological changes affect even research environment, with increasing competition for students, especially at the doctoral level, and academic researchers, which are so importation to local and national innovation (Kim et al., 2009, Black and Stephan, 2010) and with a growth in collaboration in research. All these developments have contributed to the proliferation of rankings and evaluation exercises that are considered by policy makers and citizen and at the same time are the subject of profound critiques, in particular for their unintended consequences.

Within this context, a relevant question arises: What types of public policies for science, technology and higher education for the coming decades, both for individual member states as well as the EU as a whole, are necessary?

This question can be further refined as follows: Which governance regimes are more conducive to the better performance of the higher education systems? Which characteristics of national policy dynamics (i.e. interactions among political, socioeconomic and ideational factors) determine specific choices in terms of governance regimes? Which institutional characteristics permit a coherent pursuit of the system's principal systemic goals?

What changes in the governance regimes have to be implemented to achieve better levels of competition, differentiation, institutional profiling and accountability of the higher education, science and technology systems? Which governance arrangements are associated to a better performance of the higher education system, and which, on the other hand, are ineffective in this respect? What emerges from the current state of the art is the need for a systematic, multilevel, multi-methods analysis capable of taking into account the complexity of the phenomenon and its multifaceted (and often interconnected) dimensions.

Within this framework, the implementation of evaluation exercises play an important role. In fact, new opportunities and challenges are offered by the availability of new data and new methods and approaches. In the last few years, several initiatives at European level have been based on an intense

production and use of new data. In the field of data on universities, the pioneering efforts of Aquameth (Daraio et al., 2011; Bonaccorsi and Daraio, 2007) and subsequently of Eumida (Bonaccorsi, 2014) have been transformed in an institutional initiative called ETER (European Tertiary Education Register, <https://www.eter-project.com/#/home>), which has made publicly available microdata on universities for the years 2011-2015 (data for 2016 will be collected, validated and made available in summer 2019). These efforts from Europe have a major counterpart on the other side of the Atlantic, where the STAR Metrics initiative (see <https://www.starmetrics.nih.gov/>) has promoted a federal and research institution collaboration to create a repository of data and tools that is producing extremely interesting analyses.

All these efforts, however, are based on the construction of new datasets, or the integration of existing datasets into new ones. They do not solve the issue of comparability and standardization of information and of inter-operability, updating and scalability of databases (Daraio and Glänzel, 2016). However, recent developments in engineering in computer science could be helpful and should be further explored to address these issues (Daraio et al., 2016a). Daraio and Bonaccorsi (2017) illustrate the design of a possible information system to integrate microdata on universities with other sources with the aim of overcoming rankings by linking data in an open platform. In particular, the new developments may be useful to consider data quality dimensions and the openness of the data platform, although the limits of data and their availability and interoperability still remain a critical issue (Daraio et al., 2016b, Borgman, 2015) that need to be considered in the development of metrics for the assessment of research, education and innovation (Daraio, 2017).

The following questions have been discussed during a Round Table (or Panel Session) held within the Yearly Scientific Meeting of the Italian Association of Management Engineers (RSA AiIG henceforth) (<http://www.convegnoaiig.it/2016/en/>), hosted by the University of Bergamo on 13-14 October 2015. They could be helpful in understanding some of the mechanisms that influence the systemic performance and the impact of the higher education system and its interrelationships with science and innovation systems.

Addressing these issues as a whole is the ambitious goal of this special issue. Our rationale is to provide an opportunity for researchers to create a bridge between these different streams of literature, relying to the different tools and approach needed for an overwhelming understanding of the challenges ahead, and the design for the policies required to face the most pressing questions in the complex global landscape.

3. Overview of papers included in this special issue

Applying and integrating theories, methodologies, and conceptions borrowed from multiple disciplinary fields, this special issue has called both qualitative and quantitative research to investigate the managerial consequences on HEIs of the social, economic, and technological shifts in society, uncovering the unique features and unconscious assumptions that possess our vision and mindset. The volume is therefore diversified, characterized by contributions from different fields. All the seven papers in this special issue contribute to a better understanding of today's research and higher education policies, but they do so by addressing three complementary approaches. In a first part, a public policy perspective allows identifying and analyzing the governance arrangements of different institutions into each system. In the second part, , an economics perspective, characterized by a quantitative approach, allows measuring the effects of past policies on higher education systems and institutions, with a particular focus on efficiency, competition, as well as regional development.

Third and last, a managerial perspective will consist in an analysis of differentiation mechanisms, institutional profiling and accountability.

The first section is composed by two papers exploring the recent wave of changes in the governance regimes that has taken place in Europe over the past decade.

Capano and Pritoni (2019) analyze how, over the last 30 years, governments have continuously adjusted their Higher Education policies to make universities more efficient (achieving more by spending less) and more effective (by increasing the percentage of graduates, by reducing the number of university dropouts and by focusing more on the third mission). At the core of governmental endeavors to reform Higher Education lies the redesign of the actual governance mode: governments have not only changed the general principles of Higher Education governance but also continuously changed the mix of those policy instruments they have chosen to adopt. The steering at a distance (also supervisory, or supermarket model) appears to be unable to cover these differentiated trends. Scholars have underlined that each country has designed its own hybrid interpretation of the common template. The paper focuses on this issue, describing how governance has been hybridised at the systemic level and detailing the content of these changes, operationalized with regards to policy instruments together with two financial dimensions. As a result, it emerges that three types of hybrid systemic governance modes are actually present in Europe: a performance-based mode, a re-regulated mode and a systemic goal-oriented mode.

In the second paper of this special issue, Donina and Hasanefendic (2019) address the homogeneous/heterogeneous dilemma regarding formal arrangements of university central governance structures. Most topical studies argue that these structures are becoming homogeneous across countries and prove it by adopting purposive sampling techniques. Yet, other scholars stress heterogeneity within countries. This paper aims to clarify this dilemma through a multi-level analysis that simultaneously considers three levels of embeddedness (i.e., supranational, national and institutional), by employing a policy translation perspective, which can accommodate both homogeneity and heterogeneity. The national sample comprises three countries (the Netherlands, Portugal and Italy). The institutional sample is comprehensive and encompasses all public universities within each country. Their study discloses heterogeneity in how countries responded to supranational policy pressures as well as heterogeneous responses at the institutional level even when unitary laws are applied. Relying on these findings, they stress the importance of adopting comprehensive (rather than purposive) sampling to infer about international and/or national homogeneity because studies that generalise results based on one/few case studies per country could be biased by the sample selection criteria. In addition, the paper discusses the research implications of this analysis on steering-at-a-distance and on the relation between the grade of cogency of the national laws and homogeneous/heterogeneous reform outcomes.

A second group of contributions, motivated by the large number of reforms analysed in the former section, provide insights on how policies affect performances, and how both can be evaluated.

Checchi et al. (2019) study the potential impact of introducing performance- based funding systems (PBFS) on national research systems, using information on the number of publications and their scientific impact (citations or publications in topranked journals) for 31 countries over the period 1996– 2016. The analysis is performed both at the aggregate level and looking separately at each of the six main scientific areas identified according to the Organisation for Economic Co-operation and Development (OECD) classification. On average, PBFS are found to increase the number of publications, though the effect is only temporary and fades after a few years. Looking at the scientific impact, PBFS are found to have a negligible effect on excellence as measured by the share of articles

published in the top journals, irrespective of the type of assessment adopted. On the contrary, PBFS have some influence on average research quality, as measured by the number of citations per paper normalised with respect to the field.

Second Lehmann and Stockinger (2019), analyze competition-based policy programs as an external steering mechanism to create beneficial outcomes for societies that are also entering the Continental European higher education landscape. The Excellence Initiative in Germany was aiming to enhance research quality, international visibility and supporting peak performing universities. They study if a side effect occurred that the Initiative had on academic entrepreneurial activity and if so, whether it is a system-wide and/or a “winners” effect. They measure entrepreneurial activity by the patenting activity and industry collaboration of a university. The analysis is based on 73 German universities observed from 2004-2011. Employing a difference-in-differences estimation, they find that the Initiative created an advantage for whole Germany while being an Excellence University does not have an impact on academic entrepreneurship in terms of patenting activity. However, they find a Matthew effect in terms of rewards in industry collaboration, and conclude that the Initiative had positive side effects for the system and partly also for the winners of the competition.

The third area of this special issue provide, through a mixture of qualitative and quantitative approaches, a picture of current challenges for research and higher education, providing implications for future policy interventions.

First, Cattaneo et al. (2019) show that, due to significant government cuts to Higher Education funding in Southern European systems, underfunded universities were forced to increasingly compete for students as sources of additional revenue. Concurrently, families and students that continued to afford participation in Higher Education became more selective when choosing a university, realising the riskier investment that Higher Education participation had become. Through a competing destinations model and relying on all Italian private and public universities, the study finds that the competition forces characterising universities’ attractiveness over the last decade have changed since the financial crisis of 2008. In a context of lower demand for Higher Education, the competition for students grew and universities in close proximity were better prepared to face the new challenges, leading to the growth of Higher Education clusters.

Second, Abdelkafi et al. (2019) show that, during the last decades, there has been increasing interest in the role of the university as a key stakeholder and agent in the innovation ecosystem and regional development. In the face of new challenges, especially growing digitalization and deeper societal chiasms and economic crises, the paper revisits the managerial style of the university in Europe, proposing the concept of a business model for universities, suggesting an entrepreneurial spirit and way of thinking for universities to remain in their role of knowledge innovators and transmitters. The paper does not aim at finding a plan to balance between universal access to higher education and the highest levels of excellence in both research and education. Even though such a debate is important, the positions of universities on that matter are closely related to the politic of the organizations themselves. However, the three missions of the university remain at the centre of the contribution, namely education, research and opening outwardly. Based on the re-evaluation of secondary data, the authors develop five conceptual theses based on four elements of the business model framework: value proposition, value creation, value delivery and value capture. By help of the following theses, they aim to trigger new discussions new policy implications for the future university in Europe.

Last, Biesenbender (2019) takes a policy-analytical perspective on the evolution of standards of research information (RI) and provides a framework for analysing processes of RI standardization in different research systems. It focuses on the choice of policy instruments on the macro level

(government) and their effects in terms of policy reactions, decisions and practices on the meso level (higher education institutions). Next to providing a theoretical frame for analysing and comparing – direct and indirect – RI standardization processes, the paper presents exploratory evidence with regard to the German and Italian science systems. Overall, the paper illustrates the complexity inherent to the governance of higher education and research by focusing on two diverse cases with respect to the governance and standardization of research information. Different research information policies have different effects on the – direct or indirect – standardization of research. Understanding these processes and dynamics is of relevance not only for policy makers but also for scholars using (quantifiable) research information evaluations and analyses from different disciplines (e.g. bibliometrics, scientometrics or science studies).

Taken together, these papers offer a showcase of the current wave of reforms of Research and Higher Education policies in Europe, provide insights on what motivated such reforms, which of them have been effective, and what are the challenges to be faced in the near future. The integration of both qualitative and quantitative approaches, as well as the multidisciplinary approach characterizing this special issue, make it possible to provide an in-depth understanding of today's dynamics in the policies for higher education, and derive new guidelines for future interventions. We believe that these contributions provide a valuable overview of what is going on nowadays in research and higher education, and offer to policy makers, institutional leaders and higher education stakeholders, fruit for reflections, debate and further research.

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