

Higher education policies in Europe with special focus on the role of basic sciences¹

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When I was invited, by professor Hudecz, to deliver an introductory lecture at this conference of ANSO, I asked him whether talking about the European Union would be relevant in this context. After receiving a positive reaction I started thinking about what would be the most relevant content in this specific context. Science, innovation and higher education policies and actions in the European Union is a huge domain. It has a long history, with many players, many policy initiatives and many programs. Entire bookshelves could be filled with books, studies and academic papers published about this.

So I was asking myself: what an academic community, like ANSO, could benefit from looking at what the European Union has been doing in this field. After some hesitations I came to the conclusion that perhaps there are two themes that might be particularly relevant here. One is the so called *knowledge triangle philosophy* and the other is the presentation of some relevant *key developments*. But, in addition, something should also be said about the emergence of this common policy field, and also about the global context.

The evolution of EU science, innovation and higher education policies

So before starting discussing the two selected main themes a few words have to be said about the evolution of science, innovation and higher education policies in the European Union. Perhaps the most important thing is to stress that during several decades the role of the European Union in science and research was driven by striving for innovation-led economic growth and competitiveness. Basic research was not considered as a priority, and actions related with higher education were limited to enhance university-business cooperation, mobility, inter-university partnerships and mutual policy learning.

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And the attitude of national academic communities towards the role of the European Union in higher education was rather ambiguous. Strengthening cross-border mobility and inter-university cooperation were naturally welcome, but the emphasis on the role of universities in enhancing economic growth and competitiveness was seen with much suspicion and reluctance. Academic circles have often been criticising the narrow, “instrumental” perspective of the European Commission. This started to change two decades ago when the idea of the knowledge triangle emerged. We shall come back to this.

The emergence and the evolution of EU policies for research, innovation and higher education led to an increasing Europeanisation of national research and higher education systems. This made it possible, among others “*for researchers and research organisations to bypass influences from their national research spaces by linking directly to opportunities offered by the European research space*” (Nedeva – Wedlin, 2015). A key element of this process has been the strengthening of the connection between higher education, scientific research and business innovation.

The knowledge triangle

The knowledge triangle metaphor, so often used in the dominant European discourse on science and innovation policy, might help us to understand the internal dynamics of this policy and the efforts to find a balance between three key players. The first is the *university* as an institution with a teaching and skills development mission, often supervised by ministries of national education. The second is the *academic community*, doing research, either in research universities or public research institutions, and often supervised by ministries responsible for research and technological innovation. And the third is the *economic and social sphere*, sometimes simply called “business” where new products and services are continuously developed for the market, typically under the supervision of ministries of economy, and supported by agencies responsible for national technological development. These three competing poles exist not only at national level, but also at the level of the European Union, where different “directorates general” are supervising education policy, research policy and economic or industrial policy.

The key message of the knowledge triangle metaphor is that these three groups of players, and their supervisory authorities should work together in a balanced way. None of them should dominate the two others, and their interplay should create dynamic systems of knowledge production, knowledge sharing and knowledge utilisation.

In fact, during several decades the knowledge triangle space in the European Union was dominated by the innovation pole, that is, by players strongly connected with the economy, and interested mainly in economic growth and competitiveness. Efforts to eliminate this lack of balance started only two decades ago, when the heads of the EU member states adopted the so called Lisbon strategy. Our Asian friends might have heard about this turn, which led to the setting of very ambitious development goals and made education and research policies a high level priority in the European Union.² This was the origin of what we call the *European Research Area*, aimed at creating a supranational European public science or research system besides the existing national systems, through creating new supranational institutions and

² See more about this in Halász, 2013.

processes. One implication of this was the launching of a new European modernisation agenda for higher education. These two efforts have naturally been strongly interconnected.

This has also had implications for what we call basic or fundamental research, or, as it is increasingly called, *frontier research*. We have to stop her for a second. The emergence of the notion of frontier research is a very significant event. It illustrates well that in a balanced knowledge triangle the sharp borderline separating what we used to call basic and applied research is fading. The stress is not any more on the presence or the lack of application but on doing research on (or beyond) the frontier of our knowledge. The stress is on research courageously penetrating into the unknown and discovering new things. We are not much interested any more whether this is “pure” or “applied”: what counts is the creation of original new knowledge.

Key developments

And now let us move to the second point. From the many relevant and ongoing processes I selected four to illustrate the changing dynamics of research, innovation and higher education policies in the European Union, with a special focus on basic research. These are

- The supranational funding of frontier research projects
- The building of supranational institutions
- The development of human resources for research, and
- The European level use of science for policy advice

Supranational funding

EU level funding of research and innovation activities has been assured by the multiannual “Framework programs” since the middle of the eighties. They have provided financial support typically for collaborative projects initiated by consortia, including universities or research institutions and companies from different EU member countries, and also for research and innovation networks. The focus has been on technological research and innovation, with the aim of fostering economic growth and competitiveness or supporting the solution of urging social, economic or environmental problems. After the decision on the European Research Area in 2000 an important shift took place. Supporting basic or fundamental research, or under the new label “frontier research”, became a legitimate objective.

This is the best illustrated by the creation of the *European Research Council* with the aim to provide direct supranational funding to individual researchers or researcher teams, on the basis of competitive applications. This has created an entirely new paradigm. The European Research Council, formally established in 2007, is the “*EU’s first funding body set-up to support fundamental investigator-driven research with academic excellence as the funding criteria.*” (Gornitzka - Metz (2014; 81). ERC as a supranational agency selects projects on the basis of “excellence”, without considering any political or geographical factors. Only „frontier research” is funded. Between 2014 and 2020 the EU Framework program, called “Horizon 2020”, provided 13 billion Euros for this purpose.

The creation of ERC has had a major impact on funding research in Europe and contributed significantly to the Europeanisation of national research systems. It has not only made basic research a legitimate target for European funding but also altered the internal organisational

dynamics in many universities. It has been a major step to strengthen the links between ERA and the European Higher Education Area.

Supranational institutions

A further key element of the Europeanisation of research and innovation has been the creation of various supranational institutions. Before the launching of the European Research Area a number of supranational agencies were already existing, such as the Joint Research Centre (JRC) which has been the “in-house” research organisation of the European Commission, run directly by it. Besides the European Research Council another important European research and innovation organisation was created in the last decade: the European Institute of Technology (EIT - later renamed European Institute of Innovation and Technology). This agency was formally established in 2008, with its headquarters in Budapest. Between 2014 and 2020 2,4 billion Euros was provided to fund its operations.

The EIT could perhaps be described as a kind of counterweight to ERC: while the latter is supporting fundamental or frontier research, EIT supports so called “innovation communities” which are clusters or institutionalised partnerships of universities or research organisations and companies in specific research intensive sectors. At present there are eight such communities.

Beyond the supranational agencies, operating under the direct control of the European Commission, we can see a dense web of networks, communication platforms and partner organizations, with members cooperating and competing with each other at European level. The European Union has often been described as an emerging model of “network governance”: the research and innovation policy landscape is a perfect illustration of this. It has been an explicit goal of the Framework Programs to support directly the creation of European knowledge creation and knowledge sharing networks (Breschi – Malerba, 2009).

While some of the European level institutions and networks have been created by top down initiatives, many of them emerged from bottom up actions. It is not surprising that European level collaboration of national academies of sciences has also resulted in the emergence of such institutions. One example is the European Federation of Academies of Sciences and Humanities or “All European Academies” (ALLEA), created in 1994, another is European Academies Science Advisory Council (EASAC). The former has been oriented many towards „policy for science”, while the second has been providing policy advice, which is can be labelled „science for policy” (Engwall, 2015). I shall come back to this later.

Human resources for research and innovation

The third illustrative case I selected is the development of human resources for research and innovation. Here I would like to focus on one specific area: the emergence of a European policy related with doctoral education. I think this case is illustrating particularly well the nature of European policy making that we could describe as facilitating developments in an open, multi-player policy space using symbolic tools and incentives. This policy space is multi-player, because it allows the interaction of many actors from all the three poles of the knowledge triangle, including not only government agencies but also “frontline” institutional actors, such as academic organisations. It is also open, as it allows the participation of players from outside the European Union in the framework of the European Area of Higher Education created by the Bologna process, which could perhaps be described as an “EU controlled non-EU project”. The European Commission, sometimes described as the government of the EU, is playing a kind of

facilitating role in this complex, multi-player, open space. The case of doctoral education is perfectly illustrating this.

Concrete initiatives aimed at modernizing doctoral education were started outside the European Union, in the framework of the Bologna process. This was launched by the 2003 Berlin ministerial meeting where ministers made an important declaration:

„Conscious of the need to promote closer links between the EHEA and the ERA in a Europe of Knowledge, and of the importance of research as an integral part of higher education across Europe, Ministers consider it necessary to go beyond the present focus of two main cycles of higher education to include the doctoral level as the third cycle in the Bologna Process” (Berlin Communiqué)

This opened a new area of action where a number of important specific initiatives could be realised. Let me mention just a few of them. The first is the activation of powerful actors who became change agents in this field. A number of influential academic leaders created consensus on common principles (Salzburg principles), and they established powerful new institutions (such as the Council of Doctoral Education of the European University Association) to support the implementation of these common principles. Second: an intensive mapping activity was started, leading to the production of substantial knowledge about the extremely complex landscape of doctoral education in Europe, paving the way towards harmonisation.

Perhaps the most important new development in this area has been the conception of the doctorate as a competence-based qualification. This happened through the inclusion of this level into the European Qualifications Framework, which is a particularly strong voluntary regulatory instrument in the European Union. The fourth element is the creation of a new category: the “early stage researcher” which redefined the status of what we typically call “doctoral student”. This happened first under the Erasmus+ program, supporting the creation of joint European doctorates under the supervision of education policy actors, and later, under the Marie Curie program which also aimed at enhancing the recruitment of new young researchers (Repečkaitė, 2016).

And last but not least the whole process has been accompanied by an intensive involvement of non-academic players, such as employers, for example. Now, if we participate in joint doctorate initiatives, we cannot do it without building partnerships outside the academic world and without building internship components into our program which allow our early stage researchers to spend part of their training outside the traditional academic environment.

Use of science for policy advice

The fourth key development I would like to mention here is related with the role of science in informing policy, which has long been a key element of the European higher education, research and innovation policy landscape. Jüri Engelbrecht, the Former President of the European Federation of Academies of Sciences, when speaking about the role of academies, mentioned two complementary missions related with policy: one is „policy for science” and the other is „science for policy” (Engwall, 2015). The former means strengthening the position of science in policy debates, the second is using science to improve policy decisions. I am talking here about the second.

The European Union has a long tradition of using science and research for improving policy. The EU has a very strong culture of policy evaluation and impact assessment and it has well established institutional frameworks for this. The use of science and research for policy evaluation and the practice of evidence-informed policy-making is stronger at European level than in any of the member states. One element of this institutional architecture is the so called *Scientific Advice Mechanism* of the European Commission. There is no time here to present the details of this mechanism: I just want to evoke one specific event that might illustrate well the emerging European approach.

The *Science Advice for Policy by European Academies* (SAPEA) is a key institutional platform of the Scientific Advice Mechanism.³ It gives scientific advice to the European Commission in many areas, such as energy, environment, food safety, health and others. One of the key challenges SAPEA has been facing is the complexity of policy issues and the question of how to make sense of science for policy under conditions of complexity and uncertainty (SAPEA, 2019a). Two years ago SAPEA organised a symposium in Finland about the future of science advice in Europe. This event was part of the program of the Finnish Presidency of the Council of the European Union under the auspices of the Finnish Academy of Sciences. At this event scientists had the opportunity to express their views about how science should be used to improve policy making in the European Union. Working in small groups they formulated key messages and then they voted on them, in order to set a priority list. Let me present some of the outcomes of this, because it illustrates well the emerging way of thinking about the use of science for policy advice in those European academic circles that are the most active and most committed towards science-based advice for policy (see box below).

The ranking of key messages on science-based policy advice

1. The principle that policy should be informed by evidence is under serious attack. Politicians, scientists and civil society need to defend this cornerstone of liberal democracy [Scientists should] better understand the importance of values, emotions and beliefs. (Philosophers can help.)
2. Bold pilots and patience are the key for long-term systemic change. Flexibility, engagement in networks where evidence exists.
3. For impact of science advice you need to identify the recipients and work with them from the beginning.
4. Include citizens in the early stages of drafting advice for policy — not just at the end. ('Science capital' concept can help to identify participants)
5. Scientific advice is crucial particularly if issues are complex, uncertain and contested. It's always better than intuition.
6. Low hierarchies, high societal trust, and high trust in science enable experimentation and innovation in developing future science advice capabilities.
7. Do not mix science for policy (advice) and policy for science (lobbying).
8. Scientists are not a passive source of knowledge but a pro-active resource to exchange knowledge with
9. Science advice needs to be organised so that it is independent and based on internal quality control, but yet close to the concerns and the needs of the Commission in general and the various policy arenas in which they interact.
10. How to engage and motivate participants: responsibilities to work on the topic, motivation and incentives to work and participate, engagement needed but that demands resources.
11. Processes need good planning, time and well-working transparency.
12. Social, political and technological sciences can tell us the "how" not just the "what".

³ See the website of SAPEA here: <https://www.sapea.info>

13. Involve policymakers more strongly in co-creation of advice, as well as science communicators”

Source: SAPEA (2019b):

I think this is particularly interesting because it shows the emergence of what I could call communicative paradigm of science-policy dialogue. This paradigm dropped the assumption that science knows the answers for all questions societies and elected politicians face in our post-modern world. Instead it offers scientists the option of actively participating in the broader social-political dialogue, and contributing to the common elaboration of appropriate answers.

EU research policy in the global context

Finally, in the context of this conference, we also have to say a few words about the external or foreign relations dimension of the research and innovation policy of the European Union. Since its inception the European Research Area has been conceived as a space open to the external world. One year after the political decision about the European Research Area the European Commission published its proposal on “opening the European Research Area up to the rest of the world” (European Commission, 2001). The governance structure of ERA has contained a Strategic Forum for International S&T Cooperation with the mission of contributing to the internationalisation of ERA.⁴ In this forum the EU Commission, and the representatives of the science ministries of the member states have been regularly discussing the questions of research related international collaboration. The European Commission has been supporting directly capacity building in “science diplomacy”, for example, through the European Union Science Diplomacy Alliance and its S4D4 project.⁵ The Framework Programs have been supporting the creation of global scientific networks, for example, through the ERA-NET projects. As an example I could mention the CO-REACH project (Coordination of Research between Europe and China), which supported several joint multinational research activities with the participation of at least two European and one Chinese university or research institution.⁶

I think for those who are running ANSO, this original, new form of collaboration between national science academies, it is important to be familiar with the research, innovation and higher education policy of the European Union for at least two reasons. The first is the fact that what the European Union has been doing in this area, is full of original, innovative and inspiring solutions. Many of these solutions have been tested and evaluated, and they can be an important source for mutual learning. The second reason is that some of the member organisations in ANSO are located in the member states of the European Union, therefore they have strong commitments within the European Research Area and the European Area of Higher Education. These commitments have created a number of existing paths that necessarily influence their behaviour, their expectations and their opportunities. Taking this into account would certainly improve the chances of ANSO becoming an effective form international scientific collaboration.

⁴ See the background, the mandate and the goals and SFIC here:

https://era.gv.at/public/documents/4132/Presentation_Strategic_Forum_for_International_ST_Cooperation.pdf

⁵ See the website of the EU Science Diplomacy Alliance here: <https://www.science-diplomacy.eu/about/eu-science-diplomacy-alliance/>

⁶ See the presentation of the project at the website entitled „CO-REACH - Coordination of Research between Europe and China” here: <https://www.internationales-buero.de/de/428.php>

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