[Theme in Focus] Promoting Open Science and collaborative Research within the Western Balkans (September 2018)

Open science succeeds in promoting science and increasing transfer of scientific knowledge

Intangible values such as knowledge, inventiveness and creativity drive more and more the current global economy scene. Research and innovation benefit indeed from scientists, research organisations, enterprises and citizens accessing, sharing and using scientific knowledge. A broad literature reveals that open access to scientific research publications and data while enhancing international dissemination. It moreover strengthens interdisciplinarity, compresses the rate of duplication of studies, facilitates the transfer of knowledge to businesses and transparency towards citizenship, and helps to ensure preservation over time. Thus it is important to promote open science and innovation. **Open science has become a significant way of promoting science and increasing transfer of scientific knowledge both internationally and within the EU**. Firstly, through open science, research outputs are rapidly available to other researchers thus preserving resources, improving the quality of research and allowing advanced research-related questions to be raised. From another point of view, open science and research offers access to citizens, companies and decision-makers, and increases the opportunities to participate in scientific research as well.

European policies for Open Science

The Open Science/ Open Access movement has taken important steps in the last decade and has been subject of international and European policies. International organizations, states, public and private donors, universities and research institutions set up the technological and/or normative infrastructure to allow the public to access and re-use the results of scientific research free of charge. In particular, the European Union (European Research Council and Horizon 2020 program) set precise regulatory requirements for the opening of publications and scientific data resulting from research financed with European funds. In 2015, the European Commission set three goals for research and innovation policy within European Union: Open Innovation, Open Science and Open to the World. These concepts have promote the idea of opening up European research and innovation systems to move towards a reality where knowledge is created through global collaborations, where "*the digital and physical are coming together*" as described by Carlos Moedas, Commissioner for Research, Science and Innovation. One year later, the notions of open science and open innovation took a more concrete form as they become a strategic aim for Europe's scientific landscape outlined in an official EC report: "Open Innovation, Open Science, Open to the World – a vision for Europe". The idea of a European Open Science Cloud (EOSC) took shape in 2015, as a vision of the European Commission of a large infrastructure to support and develop open science and open innovation in Europe and beyond. It shall be a supporting landscape to foster open science and open innovation: a network of organisations and infrastructures from various countries and communities backing the open creation and dissemination of knowledge and scientific data (Report on the governance and financial schemes for the European Open Science Cloud). The EOSC will be officially launched in Vienna next November 2018.

What's needed for Open Science to be successful?

For Open Science to be successful, it must become embedded at every level and in every aspect of the scientific endeavor and not be perceived as separate from (or even in competition

with) current practice. Open Science needs to stimulate research integrity and quality, which includes sensitivity to disciplinary differences and confidentiality issues around knowledge sharing. Open Science requires a systemic shift in current practices to bring transparency across the system, to ensure ongoing sustainability for the associated social and physical infrastructures, and to foster greater public trust in Science. To enable this, all research-related stakeholders need to take responsibility for supporting Open Science activities, which includes appropriate financial and administrative support to ensure its long-term sustainability and minimize the bureaucratic burden on researchers. In such a context the Open Science Policy Platform has recently released a prioritised set of actionable recommendations) to achieve it. The OSPP members strongly recommend their urgent inclusion into FP9. In parallel, the Recommendation on access to and preservation of scientific information (2012/417/EU) were recently revised to reflect developments in practices and policies in open science and in view of the preparation of the next Framework Programme for Research and Innovation (Horizon Europe). Another report "Implementing Open Science: Strategies, Experiences and Models" proposes a National Roadmap for the Implementation of Open Science, listing the steps involved in the transition to a national research governance policy that is supportive of Open Science activities.

Factors hindering proper open science

Open Science is an international phenomenon, but there remains, above all among researchers, a lack of awareness of what actually the Open Access represents and how it integrates into the "open science" movement that affects all the missions of science and above all the scientific areas, from the hard sciences to the human and social sciences. In particular, there remain many obstacles to effective, complete and systematic implementation of opening policies with regard to publications, data, technologies (Open Source), and online training resources (so-called Open Educational Resources). Factors hindering a proper open science and innovation are legal barriers, cultural differences between the science communities and enterprises, lack of incentives, as well as fragmented markets for knowledge and technology. It is particularly important to link knowledge transfer between public research institutions and the private sector, while respecting intellectual property rights. These hindering factors must be removed in order to improve knowledge transfer, open access to, and optimal circulation of research results. The EC Open Science Skills Working Group in its report "Providing researchers with the skills and competencies they need to practise Open Science" affirms that for Open Science to become a reality, researchers need appropriate discipline-dependent skills training and professional development at all stages of their research careers and put forward key recommendations to enhance open science skills in the research community. Actually, there are many tools to get close to Open Science: courses videos, tutorials, guides, articles. Just to mention the supporting and training services by OPENAIRE and the training courses by FOSTER

Open Science in the Western Balkans

In the Western Balkans investments to public research systems are low and cooperation between universities and industry generally limited to a very small number of large businesses. In such a framework Open Science and Open Access have the potential to open access to the research results to be used for innovation in the smaller and medium sized companies, as well as for wider public. Open Science would support the circulation of knowledge and encourage collaboration across different disciplines and technology domains. Open Access policies would promote competitiveness and therefore the importance of quality and impact of research results which are currently still low in the region. In 2016 seven Western Balkans' economies joined the European Union in pursuing the EU Open Science Agenda at the Open Data and Access and agreed to appoint national points of reference for the Open Science as well as to establish the Working Group on Open Science.

WBCs Developments in Open Science and Open Access policies in their economies were presented (together with those by EU Member States) at 5th meeting of the EU network of National Points of Reference on Scientific Information (NPR) in Brussels, in December 2017. WBCs were asked to take into consideration the Recommendation on access to and preservation of scientific information. In order to promote the adoption of Open Science policies and associated measures in the Western Balkans, the established Working Group on Open Science at the Regional Cooperation Council aims at assisting the region to move closer to adoption of the EU 2012 recommendations on Open Science. In particular the RRC intends to support definition of clear policies for the dissemination of and open access to scientific publications and research data resulting from publicly funded research. In parallel it intends to foster synergies among national e-infrastructure and designation of a National Point of Reference for Open Access. The working group operates through activities outlined in a rolling three year Work Plan. Check out here updates from this working group.

According to available data, Western Balkans are involved in 9 EU-funded projects from H2020 in the area of e-Infrastructures and as such benefit of € 2,28 million. E-Infrastructures are crucial to foster Open Science, support the circulation of knowledge and encourage collaboration across different disciplines and technology domains. Particularly interesting is the EOSC-hub that aims at developing a single access channel delivering a common catalogue of research data, services and software for research and act as the integration and management system of the European Open Science Cloud. FYR of Macedonia is the only beneficiary from the Western Balkans region. Nevertheless this participation is strategic to integrate the region into a network of pan-European e-Infrastructures. OpenAIRE (now Advance) is another project developing a network called the National Open Access Desks (NOAD) to support the Open Access and Open Data policies and implementation in Europe. There are NOADs already existing in the Western Balkans (Serbia, Croatia, FYROM) and pursuing this objective. The University of Belgrade (Serbia) is for instance one of them.

The Analysis of Open Data and Open Science Policies in Europe was recently updated to reflect Open Data policy changes that have surfaced between June and November 2017. New activity around national approaches to open data and open science has been identified also in Serbia. In this country actually the discussion about OS started in 2014 when OA was mandated only for PhD theses. A working group was established by the Ministry of Education, Science and Technological Development (MESTD) and a national science policy called the 'Open Science Platform' was adopted on July 14th, 2018. Recently, also the First Rectors' Forum of the Western Balkans was held in Novisad and focused on current state of affairs and prospects of science and higher education in the Western Balkans.

Close to the Region, the Government of the Republic of Slovenia has currently a strong agenda in open education, open learning environments, and skills creation. Recently the **"Opening up the Balkans initiative"** was held during the 2nd World Congress on Open Educational Resources in Ljubljana (18 September 2018) with the scope to align all main policy making bodies in the Western Balkans region into an integrated initiative. Here you can find the background paper. Ministers presented own "Vision and proposals for Opening up the Western Balkans", experts from academia and industry from the region discussed on "Partnerships and alliances in the region". The event resulted in a shared standpoint, a "Roadmap for Opening up Western Balkans", and a definition of a first pilot project proposed by Slovenia. An implementation charter for Openness was showcased as a driver for innovation, stability and economic and educational boost with the potential for re-skilling and job creation.

Open Science is currently thus seen as a concrete opportunity to reshape Western Balkans education and transfer of scientific and research knowledge.

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