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Rethinking the national system of innovative entrepreneurship

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Abstract

This impact paper focuses on consequences of the Covid-19 pandemic for higher education research and innovation and the entrepreneurship system. This impact paper shows through a bottom up approach, how this disruptive context calls for rethinking links between the components of this system while integrating new methods and approaches towards building a performant, impactful and sustainable national system of innovative entrepreneurship, consistent with the European strategy for innovation.

Keywords: absorptive capacity, knowledge creation, national system of innovative entrepreneurship, technological specializations, Europe

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Rethinking the national system of innovative entrepreneurship

The Covid-19 crisis has become a global and virulent pandemic with 4 million cases registered in 227 countries (according to WHO, May 3, 2020). In France, as in other European countries, this unexpected and disruptive context has undermined three pillars of development, namely the social, health and economic dimensions, with an increase in unemployment, the weakening of the social structure that threatens the spectrums of a long-lasting decline. This darker side of the crisis has consequently led the national public authorities to adopt a defensive strategy of job maintenance, substantial support to companies in order to avoid bankruptcies and financial support for health research in order to find a rapid and efficient scientific solution.

Beyond these dramatic facts, we are witnessing the acceleration of a change towards a technological paradigm which has affected all sectors, particularly that of higher education, research and innovation. This new paradigm has first and foremost forced adaptation, and secondly may lead to the unavoidable need to rethink the future of academia, the research and innovation sub-system, itself anchored within the framework of an innovation system, at the structural, organizational, coordination and funding levels, in order to improve its performance and sustainability.

To remind ourselves, an innovation system is composed of economic structures and public institutions whose actions consist in implementing a national innovation strategy, and in which the type and quality of interactions between its actors have impacts on the technological pace and trajectory of a country (Lundvall, Edquist, 1993). In this system, the education, research and innovation subsystem play a central role in ensuring productivity and strategic competitiveness. This subsystem is mainly made up of higher education institutions, research centres, transfer institutions, a network of companies and infrastructures that facilitate the resources allocation, coordinate actions and communicate in order to generate knowledge and transfer it towards innovative products and solutions.

A "glocal" model of higher education

Concerning higher education, this disruption has paradoxically allowed a rapid and accelerated adoption of digital technologies, ensuring the maintenance of distance education at the national level. On a more global level, this context has allowed a spontaneous opening up of online courses, free access to knowledge as well as a colossal sharing of experiences, of pedagogical and disciplinary methods. Therefore, it will be necessary to rethink and re-adapt the integration of virtual and hybrid teaching in student and teacher life, that has at this time been forced on institutions by the urgency of this unanticipated context, but which will probably be normalized in the future, making the digital tool an integrated yet structural part of teaching.

This outlook is all more crucial with regards to the European initiative "European University" launched by the European Commission and strongly supported by France to form, by 2025, European higher education and research around key themes, and which aims at ensuring the quality and excellence of higher education, improving the international and virtual mobility of students and all concerned stakeholders in higher education institutions, establishing transnational joint programs and diplomas between the university partners

forming these alliances, and by integrating advanced pedagogies as well as the use of the latest technologies.

Adaptation must therefore be extended to the adoption of digitalization in an intelligent way towards a pedagogical excellence, the expansion of knowledge, student mobility and that of the teaching community. This implies rethinking the business model of higher education institutions for the future. There are no immediate nor accurate solutions to these questions, but possible streams for exploration should be considered, particularly: How can higher education institutions maintain their national identities while opening up to the world through digitalization?; Must they be transformed into “global” institutions, while maintaining their local roots? These questions should be analysed in conjunction with the research and innovation component, since it is above all a global and systemic process.

The sovereignty of the national research and innovation system....

In the field of research and innovation, the covid-19 crisis was connected with a large, accelerated and multidisciplinary flow of exchanges, with wider sharing of information and scientific knowledge, facilitated in particular by the 'use of digital technologies such as high computing, complex and sophisticated digital programs, thus ensuring the processing of condensed streams and instantaneous data. These digital engines have above all allowed virtual cross-border scientific collaborations, breaking down the physical frontiers between regions within a single country, and between countries, in a spirit of solidarity and as a single human identity.

From a systemic perspective, the context plays a pivotal role in the innovation process, notably in phase of knowledge accumulation. This crisis shows the role played by the enlargement of scientific sources of knowledge accumulation in accumulating external knowledge, in developing collaborative knowledge and in producing new knowledge that will allow proposing an innovative solution to eradicate the virus. The global dimension will benefit from being supported and integrated into a better structured collaborative framework that would facilitate its dynamics and performance over the long term.

The context of this crisis has mobilized an armada of researchers with a diversity of scientific backgrounds and with multidisciplinary skills, including epistemologists, engineers in hard sciences, biologists and many others as well as practitioners, who have pooled their knowledge, their disciplinary and technical skills to gather, share and produce new knowledge in order to find solutions to the health and social issues of the more broadly global virus Covid-19. What the French president of the republic said when he declared on March 24 that *"... I have gathered today our best researchers in diagnosis and treatment. Our efforts in research will be totally mobilized in the combat against the Covid-19 virus.*

From the cognitive perspective, this crisis has highlighted the virtues of the dynamics of accumulation and production of knowledge processes, through virtual interactions between researchers from different horizons and from different countries, and has contributed to fuelling the process of cumulative learning, particularly with exploratory learning, learning by transformation and learning by exploitation (Narula, 2003; Lane et al. 2006) and interactive learning, that have consequently allowed dynamic feedback mechanisms and internal adaptations that fuel an innovation process (Ben Slimane, 2011). The effects of these broader social interactions on the accumulation of knowledge, reveal the need to support these mechanisms to improve scientific agility, to ensure a better

coordination and communication, as sources of development of absorption capacity (Zou et al, 2018), supporting smart learning and the creativity of collaborative networks in order to overcome future social, environmental and technological challenges, in a spirit of coopetition.

The technological specializations for the future

From the strategic perspective, it would be important to ensure continuous national technological sovereignty over areas that would constitute French specializations for the future. But from a systemic point of view for the innovation process, it is necessary to support the national anchoring of research and innovation in order to be able to benefit from the wider interactions. Indeed, the production of new knowledge is not systematic. It depends on the presence of a sufficient and renewed knowledge basis and on the existence of human capital, who through its skills, its productive abilities and its experiences, contributes to the development of a technological absorption capacity (Ben Slimane, 2011). These drivers of absorptive capacity must be supported within the framework of the national plan for research and innovation, which had already described the national strategy for research and innovation for the future ten years, including support for exchanges between public and private laboratories, the opening up of research and innovation efforts for better coordination between the actors.

This context informs us of the need for more sustained and substantial investment in resources and tools to allocate to scientific research but also R&D, in order to support the development of strategic specializations in key sectors (technological, social or environmental) and support the various forms of research and innovation be it driven by market needs, to advance science, to respond to social, environmental or health challenges, or to remain at the forefront of technological advances and disruptions. Particularly, targeted infrastructure and financial resources around strategic and future themes should be provided towards national technological sovereignty over the long term and thus, with national specialization, France could be better involved in a European specialization strategy.

..and innovative entrepreneurship

The final link in the education, research and innovation system is transfer, which relies heavily on innovative entrepreneurship. Knowledge-intensive entrepreneurship becomes critical and must be culturally anchored in order to break down the dichotomy between the components of the system. At the higher education level, entrepreneurship must be extended as well as for university students, as for engineering schools and grandes écoles. Students should be specially trained towards entrepreneurial culture, entrepreneurial behaviour and entrepreneurial skills. In addition, interdisciplinary collaboration through collaborative projects must extend to the humanities and social sciences in order to promote the detection of entrepreneurial opportunities and ensure the transfer of research results, transferring them to the market.

Government policies aimed at encouraging entrepreneurial initiatives must be strengthened and structured around sectoral research priorities. This involvement should be converted into targeted incentives, in particular administrative and legislative reforms as well as the substantially financial support of innovative entrepreneurial activities (Mani

2011) as well as developing financial tools and private networks to campaign for them in the prototyping phase, the seed stages, and the product development stage. Public policy should also develop appropriate regulatory and legal systems, but also financial support for innovation and R&D (Autio et al. 2014). This vision involves sustainable private funding by providing substantial support (spaces, equipment, incubation or acceleration structures, mentoring, advice, funding, etc.) thus contributing to the creation of economic value and jobs.

A high-performance national system of innovative entrepreneurship should highlight the symbiotic relationship between the triptych of entrepreneurship, innovation and development by supporting the possible synergies and potential complementarities between the actors of the system (Ben Slimane, Mhenni, 2020). In this perspective, the interaction between the various components of the system should contribute to meeting the challenge of transferring knowledge to the market, creating new innovative entrepreneurial opportunities, and scientific and technological specializations enhancing the employability and competitiveness of the national system of innovative entrepreneurship.

Conclusion: towards European expansion

The structural and operational upheavals deriving from the context of this crisis call for the unavoidable need to rethink education, research and the innovation subsystem, towards setting up French specializations for the future as well as subsequent investments. This exploration should not be dissociated from the European research and innovation plan (2021 to 2027) aiming to develop clusters of multidisciplinary European higher education, research and innovation, focused on key areas, and that aim to be strategic, innovative and inclusive, taking into account environmental and technological societal issues with a final goal to strengthen European identity and its positioning in research and innovation, and its global competitiveness.

This global approach must be preceded by a nationally localized approach, which strengthens the performance of an innovative national entrepreneurship system and which is consistent with the dual Euro-French identity, in order to benefit from a system of broader partnerships, allowing the transfer of ideas to the market to be ensured and the development of innovative entrepreneurship activities in Europe to be supported.

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