POLICY INPUT

EUA response to the new EU Industrial and Digital Strategies

June 2020

EUA welcomes the European Commission's Industrial Strategy for Europe and the European Digital Strategy launched in spring of 2020: They offer an opportunity for a broad and holistic approach to fundamental challenges that concern all Europeans and that can best be tackled together. Effective and substantial co-operation and partnership between key stakeholders in industry, universities, other educational institutions and civil society organisations, as well as cooperation between EU economies and regulatory bodies must be a key priority. Mastering the green and digital transitions while tackling the immediate and long-term impact of the coronavirus crisis will be instrumental in ensuring Europe's sustainability and resilience.

A KNOWLEDGE-BASED TRANSFORMATION

Europe's global leadership in many fields is built on its strong knowledge base. Knowledge is also at the heart of the new ambitious political priorities set by the European Commission: the transition towards climate neutrality and positioning Europe as a digital leader. These goals will undisputedly require significant efforts across the entire innovation chain but, first and foremost, they will need real disruptive innovation that comes from research driven by curiosity.

◈ **Investing in curiosity-driven research:** This must be a major pillar of the European transition towards climate neutrality and towards digital leadership next to other types of research. Without curiosity-driven research, Europe will not be able to be at the forefront of new possibilities, and instead be limited to the knowledge that we have already.

◈ **Promoting interdisciplinarity:** Climate neutrality and digital transformation are transversal challenges that must be met through interdisciplinary research projects allowing researchers and people with many different types of expertise to work together. Such research is therefore best conducted within a network of institutions, such as universities, that house many different disciplines and bring together people from different backgrounds.

◈ **Providing long-term, sustainable funding for research and innovation:** This must include the right mix of top-down and bottom-up approaches as this is the pre-requisite for Europe to become a global leader in the two transitions.

Investing in curiosity-driven research

The truly revolutionary transformations have always been brought about by curiosity-driven research; without it, there are no disruptive discoveries or innovation. Notably, curiosity-driven research has proven to be indispensable in bringing breakthroughs that address major societal challenges. Its impact is, however, often underestimated given an increasing number of aspects of life that are put under the scrutiny of economic measures. Ground-breaking innovations coming from curiosity-driven research are rarely created in weeks or months. Therefore, as Europe wants to retain its technological and digital sovereignty, it should not over-emphasise research investment for short-term goals that can only address current challenges. Universities must act as providers of knowledge to the broader society, where promoting interactive and collaborative learning will support curiosity-driven research, which can also lead to innovation. Therefore, to foster

much-needed innovation, investment in curiosity-driven research should be a major pillar of the European transition towards climate neutrality and digital leadership, alongside other types of research. Only the right mix will enable Europe to tackle major challenges. Moreover, Europe cannot manage the transformation in isolation. International collaboration in research and innovation will remain key for achieving the goals and an appropriate way must be found to strengthen technological and digital sovereignty while remaining open to the world.

Promoting interdisciplinarity

Universities with their key role in knowledge creation provide a unique space for curiosity-driven research. Their institutional profile allows cross-fertilisation of ideas across various disciplines, which is fundamental for addressing such grand challenges as climate neutrality and digital transformation. It is crucial that the knowledge produced in the social sciences, as well as in the humanities are equal parts of this cross-fertilisation. Moreover, this diversity of knowledge should be sustained by promoting diversity of researchers, ensuring gender equality and equity for minorities and disadvantaged groups. Due to its transversal nature, the research required to achieve the ambitions should be conducted within institutions that build bridges between many different disciplines and make them work together, namely universities. Hence, Europe does not need a „lighthouse", or centre of excellence to conduct cutting-edge research, as proposed in the [Commission's White Paper on Artificial Intelligence](). Instead, it should strengthen links between the existing institutions with a view to building a network supporting the creation of an ecosystem of excellence. Interlinkage of European universities must be strengthened to ensure that they remain competitive on the global scene. [Strengthening the European Research Area]() will provide a framework for such cooperation and contribute to increasing the quality and excellence of Europe's research system.

Providing long-term, sustainable funding

[Long-term, sustainable funding]() is a prerequisite for real disruptive innovations and societal progress. Europe must step up its commitment to research and innovation investments through a strong Horizon Europe programme. Notably, this includes sufficient funding for the European Research Council and the Marie Skłodowska-Curie actions, which have led to major scientific breakthroughs and strengthening Europe's leadership position in many areas. With increased support, they have great potential to substantially contribute to widening Europe's knowledge base and ultimately achieving the EU policy goals. Strongly supporting these two instruments is the natural counterpart to measures following a policy approach of smart directionality. This will ensure the right mix between top-down direction and bottom-up experimentation and exploration, which is vital if Europe wants to become a global leader in the green and digital transitions.

INNOVATION ECOSYSTEMS

Nurturing innovation ecosystems is key for attaining the goals of the Industrial and Digital Strategies. [Universities play a central role in Europe's innovation ecosystems]() providing an important tangible contribution to strategies and infrastructure development in their regions and enriching the economic, civic and cultural life. Their ability to fulfil this role has a major impact on the success of the broader European policy goals.

- ◈ **Recognising localisation as an opportunity:** The Industrial and Digital Strategies must focus more on regional innovation ecosystems beyond the production-oriented ecosystems presented in the Industrial Strategy.

- ◈ **Promoting a multi-stakeholder approach:** This must include all relevant stakeholders in the innovation ecosystem: industrial actors, universities and other research performing organisations, local authorities, as well as civil society.

- **Providing focused, coherent and efficient EU funding:** In order to build capacity in Europe's innovation ecosystems, European Structural and Investment Funds need to be focused on strong smart specialisation strategies and targeted investments in research and innovation. Moreover, it will be essential to enable better synergies and complementarities, mainly through simplification and coordination, between different EU programmes and between EU funding and national funding.

- **Valuing open innovation and social innovation** as main drivers for Europe's competitiveness: The EU should support innovation that improves the well-being of citizens and fosters sustainability. The use of IP and market valuation as indicators for successful innovation does not stimulate cross-disciplinary innovation. Indicators need to be re-balanced to stimulate social sciences, humanities, arts and creative fields to contribute. Success criteria should recognise the value of cross disciplinarity, open innovation and innovation that aim at more than economic gain.

- **Ensuring diversity:** Europe will never attain its full potential in innovation if it does not embrace societal and cultural diversity. It is necessary that all groups in society are active in developing and promoting innovation; this will make the innovation ecosystems more resilient and creative, and it will make future technologies useful for all.

Recognising localisation as an opportunity

The success of the industrial and digital strategies will depend on the strength of Europe's innovation ecosystems. The industrial strategy, in particular, emphasises the role of industrial ecosystems and the role of the players in the value chain. This rather linear, production-oriented perspective must be enhanced by an organic, innovation-oriented perspective on the regional innovation ecosystems. There is ample evidence of the role that regional innovation ecosystems play in developing Europe's resilience. They allow for regions to play to their strengths, while at the same time creating open environments that are fertile grounds for new, disruptive discoveries, as well as for facilitating the uptake of new ideas and technologies by local companies. Support for innovation ecosystems should include the use of instruments such as the European Innovation Ecosystems Instrument (under Horizon Europe) and the Digital Innovation Hubs (under the Digital Europe Programme).

Seen from the university perspective, academic partners can play a leading role in building regional innovation collaborations. Universities have the mission, capacity and the relevant expertise to lead this process and can benefit from it through knowledge exchange and improving their learning and teaching together with local partners. Europe has a unique strength in having a university system in which capacity and excellence are distributed across Europe's regions, as opposed to a few, centrally placed elite universities like in the US. This European model allows for a wide range of different regional innovation ecosystems that drive and support Europe's industrial capacity, as well as the digital transformation. It should be strengthened by building capacity to overcome Europe's innovation gap.

Promoting a multi-stakeholder approach

The coordination between industry, universities, local authorities and civil society has helped many regions reinvent themselves in the wake of the financial crisis. In many cases, this reinvention has included a strong commitment to open innovation, creating a fertile environment of start-ups and spin-outs, often originating in the local university, and often by promoting science parks or similar structures. These translate new knowledge into opportunities for businesses to profit from the possibilities of especially transversal technologies such as artificial intelligence or advanced materials.

Here, universities play an important role in facilitating the uptake of new technologies for large companies and for SMEs alike. Universities also provide an important link to the global research community through their international partners, which is vital to keep abreast of international developments in a globalised world. Importantly, universities as institutions play a strategic role within their innovation ecosystems: They provide leadership, vision, and they make substantial investments in local infrastructure. The engagement of universities and their staff and students with civil society locally and globally is likewise an important element in their contribution to sustainable development.

Providing focused, coherent and efficient EU funding

EU investment and support are essential to build capacity across the continent. Structural funds will continue to play a major role in this, and they must be focused on clear policy objectives. Smart specialisation has proven to be an important tool in building on different regional strengths and in engaging regional stakeholders, including universities. The new generation of cohesion funding must consolidate and develop the experiences made in recent years through the definition of smart specialisation strategies. Likewise, cohesion funding will need strong thematic concentration with a focus on building innovation capacity. Synergies and complementarities between structural funds, the framework programme for research and the Erasmus+ Programme and others will be central for a strategic development of innovation ecosystems.

Moreover, the EU can facilitate dialogue and sharing across Europe's innovation ecosystems. The new instruments proposed through the Digital Innovation Hubs under the Digital Europe Programme and the European Innovation Ecosystems under Horizon Europe should be used to leverage and share experience and good practice through a continuous dialogue at the European level. The European Institute of Innovation & Technology (EIT) and the European Innovation Council (EIC) continue to be an important part of the European innovation landscape giving direct support to researchers and innovators. Such instruments will be beneficial for spreading open innovation practices that will enable new technological innovation, as well as facilitating the uptake by businesses.

Valuing open innovation and social innovation

Open innovation has already shown its potential for Europe's competitiveness and resilience. Open innovation allows ideas to flow between actors in the ecosystems to be taken up or passed on to others who can use them. This increases the potential of transversal technologies, such as those at the basis of the digital transformation. These include artificial intelligence, where open innovation allows these new technologies to be used in many ways to be taken up by different actors within the ecosystem.

It is important to recognise the need for new and flexible ways of monitoring and accessing the innovation strength of Europe. Universities have been deeply engaged in developing open innovation in their ecosystems by fostering start-ups, promoting entrepreneurship and maintaining close relations with companies and civil society in order to exchange ideas and practices. However, many universities are measured largely through their production of patents, which does not show the contribution done through open innovation or the societal contribution of social innovation. It would be beneficial for all stakeholders in innovation ecosystems who embrace open innovation to moderate the use of IP generation as a measure of success. Likewise, valuation on the market is in many cases not a measure of success. Some start-ups might develop into unicorns (meaning, those valued at more than one billion euros), but that does not necessarily mean that they contribute meaningfully to the welfare and sustainability of European societies. Innovative ideas that help social cohesion or reduce the environmental impact of communities might be more valuable than those whose value is counted in market worth.

Ensuring diversity

Europe will never attain its full potential in innovation if it does not embrace diversity. At present, women and disadvantaged or minority groups are hugely underrepresented in the innovation community. This means that talent is under used and that new technologies, particularly those that rely on artificial intelligence, risk to be biased and less useful for groups that are different from the homogenous group of developers. Diversity brings creativity and quality: Embracing and promoting diversity, including but not limited to women in technology, should be seen as an opportunity and a way to promote European excellence in innovation, and not only as a question of fairness and non-discrimination. It is important that diversity is promoted as a value, for example, through the European Research Area.

USING AND SHARING DATA FOR RESEARCH AND INNOVATION

The European Industrial and Data Strategies rightfully recognise the potential of sharing and re-using data for science and innovation across sectors. Research itself is being transformed by the availability of larger amounts of data and more powerful computing infrastructure, as well as new, open research practices as part of the Open Science movement. Artificial intelligence, too, demonstrates a potential to fundamentally alter scientific discovery and innovation, but its impact depends on the accessibility, interoperability, and re-usability of quality data.

◈ **Maximising the re-usability of data:** The proposed data spaces and the Data Sharing Act should explicitly facilitate 1) access to and use of data for scientific research and 2) text and data mining for research purposes. Data shared via European data spaces should follow the FAIR principles (Findable, Accessible, Interoperable and Reusable) and abide by the principle of "as open as possible, as closed as necessary". Ethical use of data, in particular with regards to AI, must be ensured.

◈ **Systematically involving the research community:** The research community must be systematically and closely involved in the development and governance of the data spaces from the start in order to maximise their potential. The use and purpose of each data space should be clear, including responsibilities and subsidiarity of all concerned parties.

◈ **Building on what already exists:** No data space needs to start from scratch. The European Open Science Cloud (EOSC) experience can inform the development of the other data spaces. For the Skills Data Space, interoperability and efficiency with the Skills Pillar of the European Skills, Competences, Qualifications and Occupations classification (ESCO) should be sought.

Maximising the usability of data

Overall, the European Data Strategy focuses on business-to-business and business-to-government data sharing and proposes a set of sectoral "data spaces". This complements the Open Data Directive, which requires access to public sector information and the sharing of publicly funded research data according to the FAIR principles and the continuous mainstreaming of Open Science in Horizon Europe.

Privately held and commercial data may be an untapped reservoir of information with high potential for ground-breaking innovation and research. Establishing a clear framework for legal data sharing and cross-sectoral collaboration will be beneficial for academic research and innovation in business alike. Access to and use of data for scientific research via the proposed data spaces and the Data Sharing Act, as well as text and data mining for research purposes, should be explicitly facilitated.

Systematically involving the research community

The proposed data spaces represent an important opportunity to promote research and innovation partnerships between universities and other actors. To this end, the development and governance of the data spaces should happen with a systematic involvement of the research community. The potential of the proposed data spaces for research purposes should be underpinned by clear legal arrangements, processes (e.g. data governance and access arrangements for sensitive or restricted data for research), technical aspects (e.g. software, data and metadata standards, FAIR data), and measures to ensure data quality. Otherwise, the objective to spur advanced scientific research and Open Science through enhanced data access might be compromised.

Building on what already exists

Services developed by the research community for EOSC may be adaptable to other data spaces. Tools to manage data access in a safe and secure fashion, at various levels of sensitivity, will also need to be implemented across all data spaces. A degree of interoperability between EOSC and the proposed data bases should be sought, as it can be expected that several service and data providers in EOSC will be engaged in the sectoral data spaces, too.

Likewise, the proposed data space for skills should be implemented in an efficient and interoperable way with different tools and spaces such as the Skills Pillar of ESCO, while retaining maximum safety as per GDPR. The use and purpose of each data space should be clear, including responsibilities and subsidiarity of all concerned parties - in the case of skills, in particular, for those with credential- or qualification-awarding powers.

EDUCATION AND SKILLS

The Industrial Strategy underlines the importance of upskilling and reskilling for the ecological and digital transitions, which will affect every part of Europe's economy and society and shape new types of jobs that do not yet exist, requiring skills that are yet to be identified. For higher education, this means supporting the ongoing innovation in learning and teaching, by:

- ◈ **Better and further emphasising the learning process:** Students' active engagement in their own learning is key to attaining discipline-specific, as well as transversal skills, and ultimately taking responsibility for their own future learning.

- ◈ **Enabling and promoting lifelong learning:** This is the route for empowering individuals in upskilling and reskilling.

- ◈ **Strengthening employability:** This must be done through a connected process that links learning outcomes, graduate attributes and pedagogy and facilitates activities in cooperation with other stakeholders.

- ◈ **Addressing digital skills:** It is essential to ensure training of specialists, as well as preparing the wider student population for the digital transformation that affects all disciplines.

- ◈ **Participating in collective initiatives such as a Pact for Skills:** This must be done with other relevant stakeholders, and on the basis of shared analysis for skill shortages and challenges.

EUA's Trends 2018 report noted that most universities in the European Higher Education Area pay increased attention to learning and teaching throughout the institution. Education provision is at the core of the skills challenge, and in many higher education institutions, innovative learning and teaching are changing the game in this regard. It is important that both the EU and the member states support learning and teaching as a key area for policy attention, when addressing the skills demands.

Better and further emphasising the learning process

Education provision at universities typically equip students with a combination of discipline-specific and transferrable skills – the latter being well appreciated by employers, even for jobs that require in-depth technical skills and knowledge. Universities define what graduates are expected to acquire (learning outcomes) and the graduate identity to be attained after completing their studies, including for doctoral graduates and in doctoral schools. This includes the competency to continuously adapt, and conduct curiosity-driven inquiries for solutions to new challenges. The Ten European Principles for the Enhancement of Learning and Teaching put it as follows: "The higher education learning experience nurtures and enables the development of learners as active and responsible citizens, critical thinkers, problem solvers, equipped for lifelong learning. Through higher education, people should gain confidence and skills to live and learn in a changing world, able to proactively address their own and the world's grand challenges."

This means not only acquiring skills to the benefit of the labour market, but also (and firstly) nurturing individuals, so that they contribute to shaping the labour market and, importantly, to exercise their social responsibility in the society and promote sustainable development, for the benefit of all. Universities can also provide and create interdisciplinary training projects, including through strategic partnerships with other European universities.

Enabling and promoting lifelong learning

The Industrial Strategy also emphasises the need to make lifelong learning a reality – which exactly points to the direction in which upskilling and reskilling should be addressed. Lifelong learning received much policy interest a decade ago, and needs renewed attention in order to become a shared reality across the EU. Lifelong learning also requires proper frameworks that empower all stakeholders, including education and training providers, to play their complementary role. This requires mechanisms for recognising prior learning, as well as better bridging between formal, non-formal and informal learning. Many universities already offer such opportunities, through community-based learning, work placement and giving value to extra-curricular activities, to cite only a few examples. Alternative credentials, in higher education, as well as in non-formal and informal education sectors, have recently emerged as possible recognition of more flexible learning achievements.

Strengthening employability

To universities, the curriculum, or study programme level, is crucial to address employability, as it offers the possibility to develop transversal skills and work on learning outcomes, graduate attributes and supportive pedagogical approaches, in an integrated way.

The EU's Erasmus+ Programme has been instrumental in supporting the development of new innovative approaches across Europe through the cooperation actions that allow universities and other stakeholders to collaborate and develop innovative learning and teaching together. It is important that these cooperation actions be strengthened through adequate funding for diverse types of cooperation in the next Erasmus+ Programme.

However, universities also point to the difficulty of engaging with employers. In this regard, existing tools such as the European Qualifications Framework and related National Qualifications Frameworks play a crucial role in bridging the worlds of education and work. Agile systems that enable upskilling of staff in different sectors and the recognition of prior learning are crucial to strengthen employability and encourage lifelong learning.

Addressing digital skills

Europe needs a diversified approach to digital skills that empowers citizens, ensures that there are enough digital specialists and promotes digital literacy for professionals throughout all sectors. The ambitions of the Industrial and Digital Strategies will only be realised if there is the necessary investment in human resources to build and maintain Europe's digital infrastructure.

Universities have a distinct role in the education of specialists and in ensuring the overall digital literacy of graduates and professionals. Most university graduates are not trained for a specific job but should be able to use their knowledge of digital technologies in many different contexts. In addition, university curricula should put more emphasis on digital knowledge and approaches required by a given discipline.

Universities also have a role in ensuring that the digital specialists of tomorrow better reflect societal diversity, notably in terms of social, gender and other diversity dimensions, to avoid built-in bias, strengthen societal relevance and foster broad uptake of digital technologies that will be crucial for participation in society at large. The affordability of key equipment for educational purposes (e.g. computers, low-cost broadband internet) is crucial in order to successfully engage more and more people in digital learning. Generally, universities need to open their virtual doors even wider to different segments of society with different needs, in a lifelong perspective.

The Advanced Digital Skills pillar of the new Digital Europe Programme offering support for curriculum development and advanced digital skills training is a step in the right direction. Ensuring synergies and complementarities with other EU programmes, notably Erasmus+, Horizon Europe, and EOSC, and providing adequate funding, will be instrumental for its success.

Participating in collective initiatives such as a Pact for Skills

A Pact for Skills that would trigger collective action among industry, member states, social partners and other stakeholders, as described in the Industrial Strategy, would require an equally collective and collegial engagement from all parties to set it up. Universities, as those uniquely combining the missions of education, research, innovation and service to society, have a role to play as major stakeholders in the development of skills, qualifications and entrepreneurship.

Moreover, the common effort for adequate skills provision, as part of a continuous learning process and with due attention to labour market needs, must be based on sound evidence. This includes clear and transparent definitions of skills shortages and skills gaps, in a way that is intelligible for all engaged stakeholders, and so that they can share needs analysis. Such a common methodology would be a good departure point for a shared engagement.

As regards the overall approach towards skills, EUA is looking forward to the Updated EU Skills Agenda, which will play an important role in connecting related EU strategies.