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The European Strategy for Universities: Specific roles for universities of technology?

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In January this year the European Commission released a very important paper setting out an agenda for the further development of higher education in Europe, the **Communication on a European Strategy for Universities.** The Council of the European Union approved its conclusions on the strategy in April 2022.

Commission and Council call upon higher education institutions to play a **central role in the transformation of our societies and economies**. Higher education has and must have a unique position at the crossroads of education, research, innovation, serving society and economy.

As stated in the European Strategy for Higher Education Institutions, flexible approaches and new solutions are needed to overcome still existing barriers and challenges. Europe needs more than ever to reach out to the rest of the world. Universities are key in building Europe's connections with the world and in **promoting European values globally**. Thus, the Strategy aims at supporting and enabling universities to adapt to changing conditions and to meet the challenges of the future.

The Strategy identified four equally important **key objectives** to foster the contribution of higher education institutions to the future of Europe:

- Strengthening the **European dimension** in higher education, research and innovation as well as the synergies between them

- Driving **Europe's global role** and leadership

- Fostering Europe's recovery and **response to the digital and green transitions**

- Deepening the European sense of **common values**.

While the Strategy addresses all higher education institutions, in many parts of the strategy it becomes obvious, that the **universities of technology have an outstanding role to play**. Therefore, we can expect that the role and the importance of universities of technology for our societies will further increase significantly. I would like to highlight seven specific issues.

1. To start with: The **digital transformation** and the associated problems, as well as the societal and global challenges that need to be overcome, have an enormous impact on current and future professional and research fields. Universities, especially the universities

of technology, are making a significant contribution to this. The linking of digitization and sustainability is of particular importance with regard to mastering the **"twin transition".**

The pandemic has shown us clearly how important **digital skills and digital infrastructure** are for all of us in such a difficult situation. Universities of technology obviously play an important role in the digital transition, in terms of research, but also because they equip students with the necessary digital skills. Specialised education offered in digital areas, such as artificial intelligence, cybersecurity or cloud computing, as well as microelectronics, are crucial in this respect.

On the other hand, the digital transformation provides new chances for completely **new ways of teaching and learning**, which we are well advised to make best use of.

The European Strategy calls for **specialised education and training programmes** in cutting-edge digital technologies and for multi-disciplinary courses in artificial intelligence, cybersecurity, microelectronics and high performance computing. From my point of view, these are specific areas in which the universities of technology can further get involved and play a role as global front-runners.

2. Secondly, in the current **energy crisis**, universities of technology are also of particular importance, because they provide the impetus for the technologies of the future. Thanks to their achievements in recent decades, immense developments have been made in the field of energy generation and the reduction of energy consumption, which have had a lasting effect. In this context, co-operation between universities at the international level is of great importance, because only together the best solutions can be found.

3. Thirdly, the complex issue of **sustainability**, climate change and green transition.

Universities of technology should implement whole-institutional approaches to sustainability, including green skills. They have a key role regarding innovation and new green technologies and therefore contribute essentially to the green transition.

In order to quickly and adequately adapt to the digital and green transition, the European Strategy also strengthens the importance of **co-operation with business and industrial partners** to further encourage the transformation of academic knowledge into competences, skills and innovation.

4. Forthly, the importance of **STEM**-fields and the development of **human resources**.

The **labour market** is transforming rapidly, due to technological development and the digital and green transitions. Therefore, it is crucial that higher education institutions in general, and the universities of technology in particular, educate students, graduates and early career

researchers and provide them with the skills required to maximise their employability, in close co-operation with their surrounding innovation ecosystems.

The labor market **demand for STEM experts** is strongly linked to the general economic development. The digital transformation and the associated problems as well as the societal and global challenges to be overcome have an impact on society and business and shape the fields of occupation, which will emerge in the future. Universities make a significant contribution to this transformation.

Trends in the labour market show a strongly **increasing demand for STEM graduates** and the number of companies with staffing problems in STEM fields has been high for years. Demographic developments and the international competition for talents are not particularly helpful in this respect.

For this reason, among others, university graduates in the STEM focus area have **very good labour market prospects**: This is reflected in an above-average frequency of employment, above-average income, a short job search period, more frequent employment in jobs corresponding to qualifications, less frequent multiple employment and lower unemployment rates.

To meet the needs of the future labour market and society, it is necessary for universities of technology **to expand the range of studies** offered in these areas, both in quantitative and qualitative terms.

Unfortunately, the demand on the labour market does not meet the **interest of the students** in all areas, which leads to a shortage of skilled workers in some areas, as already mentioned. Measures must be and are being taken along the entire education process to address these problems.

The universities of technology have taken **action to promote STEM**, which includes both the nurturing of early interest in technology, the recruitment of students and support measures during their studies. There are numerous activities at the level of the individual university as well as joint activities on the system level. For Austria I may mention the activities within the Austrian network of universities of technology, **TU Austria**. I am very pleased that this year TU Austria is focusing on the topic of STEM education in schools. In addition, co-operations based on the established STEM offerings of the three TU Austria universities are to be intensified and expanded.

Further measures must be implemented to promote women's interest in studying STEM in order to reduce the **gender segregation** that still exists in the STEM field and to increase the overall number of female graduates in STEM, especially in engineering subjects.

While **attracting more young students** to STEM is a major target, **increasing the success rates** of STEM students is equally important. Drop-out remains significantly high in the realm of technology related studies. I am not arguing for lowering the academic profile of the

programmes, but steps clearly must be taken to foster **retention rates**. New forms of teaching and learning, like student-centred or challenge-based approaches are only one option for curricula reform. For example, the concept for the newly founded **Institute of Digital Sciences Austria** at Linz, Upper Austria, refers to so called **Living Labs** as learning opportunities by solving real world problems.

Flexible and shorter learning experiences, as the at the moment hotly debated **micro-credentials** can also be an option, while full academic programmes will always retain their value.

The issue is also supported by the establishment of new, innovative and interdisciplinary study programmes, that integrate basic computer science knowledge and digital technologies into the curriculum in an interdisciplinary way. This can be done, among other things, by integrating the **STEAM approach** into STEM education, which is as you know a transdisciplinary connection of STEM with other fields of study to promote cross-cutting, "transversal" skills such as interdisciplinary skills, system thinking, problem solving, management and entrepreneurship.

The integrative STEAM approach is particularly relevant for universities of technology, as they play an essential role in the digital and green transformation. Thus, it is even more important for them and their students and graduates to deal with the **social impact** of the technologies they research and develop and to take an interdisciplinary view to consider ethical and social aspects, among others.

To underline the importance of STEM fields, Austria has set itself ambitious goals in this regard in its **Research, Technology and Innovation Strategy** and in specific higher education strategies.

Major Goals of the RTI Strategy 2030 are

- To increase the **share of STEM graduates** by 20% and increase the share of women graduates in technical subjects by 5%
- To reach a **100 % increase in the number of Austrian STEM students** who complete a period of study abroad via support programs

Corresponding objectives are (or will be) also stated in other relevant documents like the **Higher Education Plan** and the **Development Plan for Public Universities** (GUEP), which are currently under preparation. Numerous measures and goals in the STEM field have been agreed upon with the universities in the performance agreements, which are the basic governance and funding documents in our system.

5. My fifth item refers to **technology transfer** and outreach to the universities' environment, commonly known as **"Third Mission".**

Austria's universities of technology are already frontrunners when it comes to **business co-operation** and academic spin-offs. They continuously have very high participation numbers in the so called COMET Programme, especially in the "K1 Centres", which perform cutting-edge research on the highest level and develop both competences and human resources. Equally high are the numbers of so called "CD Laboratories", in which universities and their partners undertake application-oriented basic research, working closely with business enterprises on innovative answers. This of course is to be further encouraged and supported.

We are all aware, that **co-operation among higher education institutions and with industry** can be and must be mutually beneficial for both partners. The universities of technology are best prepared for this kind of co-operation. They can support skills development for industry and the business sector, in addition to personal development purposes. Students have more opportunities to benefit from traineeships. They can also be involved in start-ups.

6. Item 6, **international co-operation**:

Of course it is obvious - and I am not telling anything new - that higher education institutions in general and the universities of technology in particular, can better solve big societal challenges by **engaging more effectively in transnational co-operation**.

In this context, the European Strategy for Universities builds in particular on the experiences of the **European Universities Alliances**. This initiative represents a vivid example of deep institutional, transnational co-operation based on joint and shared long-term visions of the involved higher education institutions.

The "European Universities' Initiative" enables a new form of very close co-operation between higher education institutions, which creates synergies, hopefully leading to an improvement of the quality, performance, attractiveness and competitiveness of the Austrian as well as of the European higher education area.

From my point of view, the **European University Alliances** contribute to achieving long-term and sustainable goals by **boosting the excellence dimension of higher education, research and innovation** by developing innovative joint study programmes, sharing infrastructures, pooling resources, strengthening the attractiveness of academic and research careers, promoting mobility, and supporting institutional change.

I am very pleased that **all three Austrian universities of technology** are members of relevant alliances, namely EURECA-PRO (Leoben), Unite! (Graz) and EUList (our host institution here in Vienna). They all deal with the major societal challenges of the future. The technological, ecological, political, economic and social aspects are taken into account as well as their transfer to society and industry. Each membership fits perfectly into the respective profile of the university and contributes significantly to the further development of the university's profile.

We all know how important it is to foster **mobility** in Europe and between Europe and other regions of the world. The transnational mobility remains a cornerstone to foster internationalisation, because a stay abroad is a particularly effective way to acquire international and intercultural sills. Besides the shorter and non-traditional forms of physical mobility, virtual forms of mobility in particular will become more important in the future. In this respect, I would like to draw your attention on the **Austrian Mobility and Internationalisation Strategy for Higher Education**, which – among other aspects – calls for an **internationalisation of the curriculum**. This means that institutions are encouraged to include an open minded and international spirit in all their activities – in order to give all students some sort of international and cross-cultural experience, regardless whether they are able to profit from physical mobility or not.

7. I am approaching my final point. If a government official addresses a distinguished academic audience like this, one issue can hardly be avoided, the issue of **funding**.

We expect a lot from our universities, but we are well aware that not much can be done without a sufficient level of funding. In Austria, in recent years we tried to do our job with the strong help of the taxpayer. In the funding period 2019 to 2021 we saw an **increase of public funding of universities**, compared to the previous three-year period of **14.6 %** on an average, the universities of technology even reached an increase of no less than **16 %**.

In the following – the current - period 2022 to 2024, university global budgets again got up by **more than 11 %**.

Nevertheless, we are facing hard times to come. Previously unknown **inflation rates**, rapidly growing wage bills and the enormous **cost of energy** are about to jeopardize what has been reached so far. While general inflation affects all universities, energy is an issue of key importance for the universities of technology.

Solutions to these major challenges must be found. I am confident that they will be found.

To sum up: There are many challenges ahead of us, but there are also chances to be taken. I fully rely on the universities of technology to pull their weight.