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EU Higher Education in the Knowledge Society

Today, terms like "knowledge society" or "information society" are frequently used. A definition for the "knowledge society" was proposed in 1970s by Peter Drucker.[1] Drucker saw that education and development, and to some degree training, would be the central concern of a knowledge society: *"In the knowledge society, clearly, more and more knowledge, and especially advanced knowledge, will be acquired well past the age of formal schooling and increasingly, perhaps, through educational processes that do not center on the traditional school".*[2]

The emergence of the knowledge society means an ever-increasing demand for a well-educated and skilled workforce across the whole economy. Workers at all levels in the 21st century knowledge society will need to be lifelong learners, adapting continuously to changed opportunities, work practices, business models and forms of economic and social organisation. In 2001, Drucker wrote about the Next Society: "*The next society will be a knowledge society. Knowledge will be its key resource, and knowledge workers will be the dominant group in its workforce".* [3]

Given the ease and speed at which information travels, every institution in the knowledge society - businesses, schools, universities, hospitals and government agencies - has to be globally competitive, even though most organisations will continue to be local in their activities and in their markets.

Nowadays, information and knowledge have become the key resources. Knowledge has value, but so too does knowledge about knowledge. Creating value means creating new knowledge and capturing its value. In fact, not the knowledge assets (or repositories) are the critical factors today, but structures and processes of knowledge production and transfer. The generation and exploitation of knowledge is now the predominant factor in the creation of wealth. Thus, the most important property is now intellectual property, not physical property, which is essential to growth and prosperity.

Knowledge has always been a factor of production, and a driver of economic and social development. "Actually, a knowledge-based economy cannot exist unless the production of knowledge and its exploitation into economic processes are interconnected. Thus, it is not the stock of knowledge that will trigger the knowledge-based economy, but its availability and its efficient use for economic processes. Therefore, the economic system will not become more competitive unless the knowledge producer, the academic system, is able to convert the new knowledge into inputs for economic processes".[4]

There is no alternative to prosperity than to making learning and knowledge-creation of prime importance, with a new focus on scientific and technological innovation through research and development (R&D). This requires a strong science and technology base and R&D capacity and also the capacities to link fundamental and applied research, to convert the results of that research to new products, services or processes, and to bring these innovations quickly to the market.

In this context, the duty of all stakeholders is to accompany the entry of enterprises and universities into this knowledge society, a society where the creation of value implies innovation, creativity, participation and competitiveness on a worldwide scale. Furthermore, competitiveness in terms of innovation involves research that ensures quality knowledge, education and training, which may result in the development of competences and the high quality of the intellectual stock requested by employers. Thus, the university becomes the key institutional resource of the European knowledge-based economy.[5]

For building a European knowledge-based economy there are four essential, and interrelated, elements:

1. *Creating an appropriate economic incentive and institutional regime* that encourages the widespread and efficient use of local and global knowledge in all sectors of the economy, that fosters entrepreneurship, and that permits and supports the economic and social transformations engendered by the knowledge revolution.
2. *Creating a society of skilled, flexible and creative people*, with opportunities for quality education and life-long learning available to all, and a flexible and appropriate mix of public and private funding.
3. *Building a dynamic information infrastructure*, and a competitive and innovative information sector of the economy that fosters a variety of efficient and competitive information and communications services and tools available to all sectors of society. This includes not only "high-end" information and

communication technologies (ICTs) such as the Internet and mobile telephony, but also other elements of an information-rich society such as radio, television and other media, computers and other devices for storing, processing and using information, and a range of communication services.

4. *Creating an efficient innovation system* comprising firms, science and research centres, universities, think tanks and other organizations that can tap into and contribute to the growing stock of global knowledge, adapt it to local needs, and use it to create new products, services, and ways of doing business.[6]

In Europe, the universities remain the main producer of knowledge and competences, and consequently Europe's universities are a major force in shaping "the Europe of knowledge.[7]

A European knowledge-based economy depends for its growth and welfare on the production of new knowledge, on its transmission through education and training - especially through the higher education sector, on its dissemination through ICTs, and on its use in new industrial processes or services. Because the universities play an important role in the fields of: research and exploitation of its results, through industrial co-operation and "spin-off" (young technological companies created by universities); education and training; and regional and local development, to which they can contribute significantly, they "are unique, in that they take part in all these processes".[8]

The European Council held in Lisbon in March 2000 set the goal of becoming "*the most competitive and dynamic knowledge-based economy in the world, capable of*

sustaining economic growth with more and better jobs and greater social cohesion" by 2010. Education and training are crucial to achieving these goals. The knowledge sector is dependent on the ability of education, in particular, universities, to offer high quality curricula in knowledge-intensive areas and to attract a sufficient number of qualified persons to science and technology. Innovation is also dependent on the ability of social partners to ensure that a generally well-educated and creative labour force stimulates, uses, and underpins it. That suppose a necessary modernisation of EU`s universities. The European Commission has published a modernisation agenda for universities which is part of the Lisbon Strategy for Growth and Jobs. The main fields of the universities` reform are:

- Curricular reform: The three cycles system (bachelor-master-doctorate), competence based learning, flexible learning paths, recognition, mobility;
- Governance reform: University autonomy, strategic partnerships, including with enterprises, quality assurance;
- Funding reform: Diversified sources of university income better linked to performance, promoting equity, access and efficiency, including the possible role of tuition fees, grants and loans.

Curricular reforms are also promoted through the Bologna Process, in which 46 countries in the wider Europe are working towards establishing the European Higher Education Area (EHEA) by 2010.

The Commission in its communication on "*The role of the universities in the Europe of knowledge"* identified five challenges and opportunities for European universities

that result from the proliferation of places where knowledge is produced, the reorganisation of knowledge via the simultaneous rise of interdisciplinarity and increased specialisation, the development an effective and close co-operation between universities and industry, the internationalisation of higher education, the rise in demand for human and social capital and the societal shift of expectations towards lifelong learning and open access. The communication also outlined three objectives that have to be taken onboard in order for universities to play a role in the creation of a Europe of knowledge:

1. Ensuring that European universities have sufficient and sustainable resources and use them efficiently.
2. Consolidating their excellence in research and in teaching, particularly through networking.
3. Opening up universities to a greater extent to the outside and increasing their international attractiveness.

Under-funding of European universities damages their capacity to maintain and attract the best talent, and to strengthen the excellence of their research and teaching activities. The main responsibilities of authorities is not only to continue to provide higher education institutions and students with a sufficient level of public funding but also to find ways to add to it by increasing and diversifying private investment in higher education. There is an increasing need to ensure that additional resources produce higher quality and relevance, lower failure and dropout rates, and enhanced social equity in access to higher education and its benefits. The detailed work

programme on the objectives of education and training systems calls for investments in certain areas that have been identified as shared priorities of the Member States.

One of the investments it calls for is in the training and retention of education staff. Higher education needs to remain attractive to young researchers and mature talent, which is to be achieved by building up bridges and mobility between universities, research laboratories and industry. Furthermore, identifying and eliminating inefficiencies in spending, will result in an increase in the return on investment at the Member State level. Sources of inefficiencies include higher than average failure and dropout rates, high graduate unemployment, excessively long degree courses. The communication from the European Commission on the Lisbon strategy noted that there are no signs of any substantial increase in overall investment (be it public or private) in human resources. [9] In particular, the EU suffers from a level of private sector investment, which is too low in higher education and continuing training.

Modernising higher education and increasing funding to university research will contribute to the EU's objective of becoming a competitive knowledge-based economy. The benchmarks for assessing the modernisation of higher education are that of devoting at least 2% of GDP (including both public and private funding - currently 1.3%) by 2015 to modernising higher education and that of increasing by 15% the number of graduates in mathematics, science and technology by 2010[10]. Progress will be measured using the following three core indicators:

- higher education graduates;

- transnational mobility of students in higher education (the goal of 3 million Erasmus students by 2012)[11];
- investment in education and training.

How looks the European higher education landscape today? Are the European universities in a position to compete with the best universities in the world and provide a sustainable level of excellence? These are legitimate questions because the European universities go about their business in an increasingly globalised environment, constantly changing and characterised by an important competition to attract and retain outstanding talent, and by the emergence of new requirements for which they have to cater. Yet European universities generally have less to offer and lower financial resources than their equivalents in the other developed countries, particularly the USA. According to all of these, a briefly overview of the recent developments in the European higher education shows that: [12]

- In 2006, about 19 million students were enrolled in higher education in the EU, (18% more than in 2000) and nearly 4 million students graduated from higher education.
- There are 13 million more higher education graduates in the working age population than in 2000.
- 197 universities from 18 EU Member States were among the 500 leading universities of the world in 2007, according to the Shanghai University ranking (while 166 were from the USA and 32 from Japan).
- Out of the top 100 universities, 54 are located in the USA and only 29 in the EU.

- The USA leads especially in terms of institutions at the very top: it has 17 of the ARWU (Academic Ranking of World Universities) top 20 universities. The EU has only two institutions in the top 20: Cambridge, ranked fourth, and Oxford, ranked tenth. Japan has one (Tokyo University, ranked 20th).
- The EU spends 100 billion Euros less each year on higher education than the USA.
- Public spending in higher education in the EU-27 (in 2004) at 1,13% of GDP, is close to USA levels (1.32%) and well ahead of Japan (0.65%), but private spending on higher education in the EU, at 0.23% of GDP, is much higher in both Japan (0.76% of GDP) and the USA (1.91%) .
- There are wide differences in public spending on higher education across the EU. In the Nordic countries it is over 2% of GDP (in Denmark, Sweden and Finland total public spending alone already surpasses the goal proposed by the Commission of investing 2% of GDP - from all sources - in higher education), while in several southern and eastern European countries it is less than 1% (the share is below 0.8% in Italy, Latvia, Malta and Romania).
- In 2006, there were about 200 000 more mathematics, science and technology graduates (+29%) than in 2000 (this already exceeds the benchmark for 2010).
- Over 600 000 EU students now study abroad (+ 50% than in 2000). ¾ of these studies in another EU country.
- About 1.7 million students have taken part in the Erasmus mobility scheme since it started in 1987.

The European Commission has identified 9 areas where changes should be made so that Europe's universities can contribute to the creation of a true knowledge

economy[13]. Each institution should find the balance of education, research and innovation which is best suited to its role in its region or country. The aim is to create a framework within which universities can become stronger players in the global knowledge society and economy. The primary goal must be to achieve excellence in the teaching and research functions of universities. The proposals put forward by the Commission include:

- boost the proportion of graduates spending at least one semester abroad or in industry;
- allow students to make use of national loans and grants wherever in the EU they decide to study or do research;
- bring procedures for the recognition of academic qualifications in line with those for professional qualifications and make European degrees more easily recognised outside Europe;
- introduce training in intellectual property management, communication, networking, entrepreneurship and team-working as part of a research career;
- refocus courses to allow greater participation at later stages of the life-cycle, thereby addressing the skills needs of Europe's workforce, and ensuring that universities are able to adapt to Europe's ageing population;
- review national student fee and support schemes so that the best students can participate in higher education and further research careers whatever their background;
- review systems for funding universities, to be more focused on outputs and give universities more responsibility for their own long-term financial sustainability, particularly in research;

- allow universities greater autonomy and accountability, so that they can respond quickly to change. This could include revising curricula to adapt to new developments, building closer links between disciplines and focussing on overall research areas domains (e.g. renewable energy, nanotechnology) rather than disciplines. It could also include more autonomy at individual institution level for choosing teaching and research staff.

The Commission stands ready to support the modernisation of EU universities through a process of identifying and sharing good practice, and through its funding programmes for education, research and innovation and the Structural and Cohesion Funds.

Framework Programmes, new funds for basic research distributed by a European Research Council, and structural funds can provide an adequate support to the building of a European Research Area (ERA). The Bologna process, the mobility programmes (Tempus, Erasmus, Erasmus Mundus etc.), the creation of universities networks and the bilateral collaborations are important tools for creating the EHEA by 2010. Both, EHEA and ERA, must be integrated to optimize their contribution to the knowledge society. "Research not only provides the necessary background for innovation but also creates a suitable environment for education […]. The knowledge society not only needs excellence and top rate research but also depends on a larger number of highly educated people who, while not engaged in active research, have sufficient knowledge to make good use of the latest research results"[14].

The Barcelona objective of spending 3% of GDP on R&D by 2010 has implications for higher education, since about 22% of R&D spending in Europe goes into

university-based research. In 2006 R&D spending had reached 1.84%. In March 2008 the European Council called for the removal of barriers to the free movement of knowledge by creating a fifth freedom based on:

- enhancing the cross-border mobility of researchers, as well as students, scientists, and university teaching staff;
- making the labour market for European researchers more open and competitive, providing better career structures, transparency and family friendliness;
- further implementing higher education reforms.[15]

The growing attention given to higher education and research by the EU is also reflected in creation of the European Institute of Technology (EIT)[16]. It addresses several issues already highlighted in the modernisation agenda, notably the fragmentation of the European higher education and research system, the lack of excellence in certain areas and the low level of involvement of business in education and research. It is expected to boost Europe's innovation capacity by supporting full integration of the knowledge triangle (innovation, research and education) and pooling resources from universities, research organisations and business partners.

In conclusion, we may say that the knowledge and innovation are the engines of sustainable growth in Europe today, and the universities are crucial for achieving the goals set out by the European Council in Lisbon in 2000. The Knowledge Society relies on the quality of human capital, education, research and innovation policies, key to boost growth. If Europe wants to compete in the global knowledge society, it must also

invest more in human capital. Skills, knowledge and competences are increasingly seen as crucial prerequisites for the productivity and competitiveness of the European economy.

Europeans have to be equipped with the tools they need to adapt to an evolving labour market. In this sense, the importance of higher education is clearly recognised, but this requires major funding and governance reforms to modernise universities due to the important role they are to play in the knowledge-based economy.

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