

The impact of the world financial-economic crisis on the structure of higher education systems

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ABSTRACT. How will be the impact of the world financial-economic crisis on the structure of higher education systems? How is it possible to modernise the structure of higher education systems and develop a new model of higher education systems? Following this area of research, our paper will be characterized by the following points: improving the quality and relevance of higher education systems; improving governance and financial funding; the landscape of universities and the international e-learning dimension of higher education systems; how modernise the structure of higher education systems; the impact of the world financial-economic crisis on the structure of higher education systems; universities and new challenges in financial-economic resources; modernising universities and new technological-scientific innovation; changes and reforms to develop a new model of higher education systems.

KEYWORDS: *Higher education systems, International e-learning dimension, Strategic planning, Technological-scientific innovation, World financial-economic crisis*

Introduction

Higher education systems have a central role in an increasingly globalised environment which is constantly changing and is characterised by strong competition to attract and retain outstanding talent, and by the emergence of the world financial-economic crisis and of new requirements for which they have to cater. How will be the impact of the world financial-economic crisis on the structure of higher education systems? How is it possible to modernise the structure of higher education systems and develop a new model of higher education systems? These questions are particularly topical as enlargement draws nearer, considering the frequently difficult circumstances of universities in the accession countries as regards human and financial-economic resources.

Despite a challenging employment climate in the wake of the financial and economic crisis, higher education systems represent a sound choice. Yet, the potential of European higher education institutions to fulfil their role in society and contribute to Europe's prosperity remains underexploited. Europe is no longer setting the pace in the global race for knowledge and talent, while emerging economies are rapidly increasing their investment in higher education institutions. While 35% of all jobs in the EU will require high-level qualifications by 2020, only 26% of the workforce currently has a higher education qualification. The EU still lags behind in the share of researchers in the total labour force: 6 per 100, compared to 9 in the USA and 11 in Japan. According to the Shanghai Jiao Tong University's Academic Ranking of World Universities, more than 30 of the highest-ranked 45 institutions are in the United States (as measured by awards and research output).

The EU Commission's proposal for the Multiannual Financial Framework 2014-2020 wants to support a strategy with a significant increase in the budget devoted to financial investment in education, research and innovation. This is because education, and in particular higher education system and its links with research and new technological-scientific innovation, plays a crucial role in individual and societal advancement, and in providing the highly skilled human capital and the articulate citizens that Europe needs to create jobs, economic growth and prosperity. Higher education institutions are thus crucial partners in delivering the European Union's strategy to drive forward and maintain growth in our society.

The new knowledge economy needs people with the right mix of skills: transversal competences, e-skills for the digital era, creativity and flexibility and a solid understanding of their chosen field (such as in Science, Technology, Engineering and Maths). But public and private employers, including in research intensive sectors, increasingly report mismatches and difficulties in finding the right people for their evolving needs.

At the same time, higher education institutions too often seek to compete in too many areas, while comparatively few have the capacity to excel across the board. As a consequence, too few European higher education institutions are recognised as world class in the current, research oriented global university rankings.

For instance, only around 200 of Europe's 4 000 higher education institutions are included in the top 500, and only 3 in the top 20,

according to the latest Academic Ranking of World Universities. And there has been no real improvement over the past years. There is no single excellence mode: Europe needs a wide diversity of higher education institutions, and each must pursue excellence in line with its mission and strategic priorities. With more transparent information about the specific profile and performance of individual institutions, policy-makers will be in a better position to develop effective higher education strategies and institutions will find it easier to build on their strengths.

The main responsibility for delivering reforms in higher education rests with Member States and education institutions themselves. However, the Bologna Process, the EU Agenda for the modernisation of universities and the creation of the European Research Area show that the challenges and policy responses transcend national borders. In order to maximise the contribution of Europe's higher education systems to smart, sustainable and inclusive growth, reforms are needed in the following key areas:

- to increase the quantity of higher education graduates at all levels
- to enhance the quality and relevance of human capital development in higher education
- to create effective governance and funding mechanisms in support of excellence
- to strengthen the knowledge triangle between education, research and business.

Moreover, the international mobility of teachers, students, researchers and staff, as well as the growing internationalisation of higher education, have a strong impact on quality and affect each of these key areas.

The Europe 2020 education headline target stipulates that, by 2020, 40% of young people should successfully complete higher education or equivalent studies. Attainment levels have grown significantly across much of Europe in the last decade, but they are still largely insufficient to meet the projected growth in knowledge-intensive jobs, reinforce Europe's capacity to benefit from globalisation, and sustain the European social model. Increasing higher education attainment must also be a catalyst for systemic change, to enhance quality and develop new ways to deliver education. Furthermore,

while the impact of demographic ageing varies across Member States, the group of school leavers from which higher education traditionally recruits is shrinking.

Therefore, Europe needs to attract a broader cross-section of society into higher education, including disadvantaged and vulnerable groups, and deploy the resources to meet this challenge; in several Member States, reducing higher education drop-out rates is also crucial. This increase in aspirations and achievement cannot be addressed at the tertiary level alone: success also depends upon policies to improve earlier educational outcomes and reduce school drop-out, in line with the Europe 2020 target and the recent Council Recommendation on early school leaving.

Europe also needs more researchers, to prepare the ground for the industries of tomorrow. To make our economies more research-intensive, reaching the 3% of GDP research investment target, the Union will need an estimated one million new research jobs, mainly in the private sector. In addition to improving the conditions for industry to invest in research and innovation, this calls for more doctoral candidates and equipping the existing workforce with research skills, and for better information on opportunities so that career paths outside academia become a genuine career prospect for early stage researchers. Tackling stereotyping and dismantling the barriers still faced by women in reaching the highest levels in post-graduate education and research – especially in certain disciplines and in leadership positions – can liberate untapped talent.

Improving the quality and relevance of higher education systems

Higher education systems enhance individual potential and should equip graduates with the knowledge and core transferable competences they need to succeed in high-skill occupations. Yet curricula are often slow to respond to changing needs in the wider economy, and fail to anticipate or help shape the careers of tomorrow; graduates struggle to find quality employment in line with their studies. Involving employers and labour market institutions in the design and delivery of programmes, supporting staff exchanges and including practical experience in courses can help attune curricula to current and emerging labour market needs

and foster employability and entrepreneurship. Better monitoring by education institutions of the career paths of their former students can further inform programme design and increase relevance.

There is a strong need for flexible, innovative e-learning approaches and delivery methods: to improve quality and relevance while expanding student numbers, to widen participation to diverse groups of learners, and to combat drop-out. One key way of achieving this, in line with the EU Digital Agenda, is to exploit the transformational benefits of ICTs and other new e-learning technologies to enrich teaching, improve learning experiences, support personalised learning, facilitate access through distance learning, and virtual mobility, streamline administration and create new opportunities for research.

In meeting the increased demand for knowledge workers, researcher training in higher education institutions must be better aligned with the needs of the knowledge-intensive labour market and in particular with the requirements of SMEs. High quality, industry-relevant doctoral training is instrumental in meeting this demand for expert human capital. Linking funding to the implementation of the EU Principles on Innovative Doctoral Training will allow Europe to train more researchers better and faster.

From this perspective, we can outline and point out these key policy issues in higher education institutions:

- Encourage a greater variety of study modes (e.g. distance and modular learning, continuing education for adult returners and others already in the labour market), by adapting funding mechanisms where necessary.
- Better exploit the potential of ICTs to enable more effective and personalised e-learning experiences, teaching and research methods (eg. e-learning and blended learning).
- Promote and increase the use of distance learning and international virtual learning platforms.
- Enhance the capacity of labour market institutions (including public employment services) and regulations to match skills and jobs, and develop active labour market policies to promote graduate employment and enhance career guidance.
- Encourage the use of skills and growth projections and graduate employment data (including tracking graduate employment outcomes), adapting quality assurance and

funding mechanisms to reward success in equipping students for the labour market.

- Introduce incentives for higher education institutions to invest in continuous professional development for their staff, recruit sufficient staff to develop emerging disciplines and reward excellence in teaching.
- Link funding for doctoral programmes to the Principles for Innovative Doctoral Training.

So, in this perspective, the contribution of higher education systems to jobs and growth, and its international attractiveness, can be enhanced through close, effective links between education, research and business: the three sides of the knowledge triangle. The recent shift towards open innovation has resulted in increased flows of knowledge and new types of co-operation between higher education institutions, research organisations and business. But the capacity of higher education institutions to integrate research results and innovative practice into the educational offer, and to exploit the potential for marketable products and services, remains weak. Working across the boundaries of research, business and education requires in-depth scientific knowledge, entrepreneurial skills, creative and innovative attitudes and intensive interaction between stakeholders to disseminate and exploit knowledge generated to best effect. Public policies which encourage partnership between professional institutions, research universities, business and high-tech centres can anchor education in the knowledge triangle, improve the continuum between basic and applied research, and transfer knowledge to the market more effectively. Improved management of intellectual property will facilitate this process.

As centres of knowledge, expertise and learning, higher education institutions can drive economic development in the territories where they are located; they can bring talented people into innovative environments and harness regional strengths on a global scale; they can foster an open exchange of knowledge, staff and expertise. They can also act as the centre of a knowledge network or cluster serving the local economy and society, if local and regional authorities implement smart specialisation strategies to concentrate resources on key priorities and maximize impact.

In this perspective, we can identify certain challenges which the Member States and universities must face in order to modernise

and restructure higher education institutions and research and compete in the global competition:

- Stimulate the development of creative and innovation skills in all disciplines and in all three cycles, and promote innovation in higher education through more interactive learning environments and strengthened knowledge-transfer infrastructure.
- Strengthen the knowledge-transfer infrastructure of higher education institutions and enhance their capacity to engage in start-ups and spin-offs.
- Encourage partnership and cooperation with business as a core activity of higher education institutions, through reward structures, incentives for multidisciplinary and cross-organisational cooperation, and the reduction of regulatory and administrative barriers to partnerships between institutions and other public and private actors.
- Promote the systematic involvement of higher education institutions in the development of integrated local and regional development plans, and target regional support towards higher education-business cooperation particularly for the creation of regional hubs of excellence and specialisation.

Improving governance and financial funding

Higher education systems require adequate funding, and the Europe 2020 strategy highlights the need to protect the growth-enhancing areas of education and research when prioritising public spending. Yet, while spending levels vary substantially between Member States, total investment in higher education in Europe is too low: 1.3% of GDP on average, compared with 2.7% in the US and 1.5% in Japan. The current pressure for fiscal consolidation has inevitably led Member States to assess the cost-effectiveness of their public investments in higher education and research: while some have reduced spending, others have increased budgets in recognition of the growth potential of spending in these areas.

Public investment must remain the basis for sustainable higher education. But the scale of funding required to sustain and expand high-quality higher education systems is likely to necessitate

additional sources of funding, be they public or private. Member States are increasingly striving to maximise the value of resources invested, including through targeted performance agreements with institutions, competitive funding arrangements, and channeling finance directly to individuals. They are looking to diversify funding sources, using public investment to lever funds from elsewhere and drawing to a larger extent on private funding; tuition fees are becoming more widespread, particularly at masters level and above. It will be important to monitor and assess the effectiveness and impact of these new developments, including on students from poorer backgrounds, and on equity and mobility.

The challenges faced by higher education require more flexible governance and funding systems which balance greater autonomy for education institutions with accountability to all stakeholders. Autonomous institutions can specialise more easily, promoting educational and research performance and fostering diversification within higher education systems. But legal, financial and administrative restrictions continue to limit institutional freedom to define strategies and structures and to differentiate themselves from their competitors. The efficiency of higher education institutions and so the effectiveness of public investment can be enhanced by reducing restrictions: on raising private revenue, on capital investment, on the ownership of infrastructure, on the freedom to recruit staff, on accreditation. Investment in professional management can provide strategic vision and leadership while allowing teachers and researchers the necessary academic freedom to concentrate on their core tasks.

From this perspective, we can outline these key policy issues in higher education institutions:

- Encourage a better identification of the real costs of higher education and research and the careful targeting of spending, including through funding mechanisms linked to performance which introduce an element of competition.
- Target funding mechanisms to the needs of different institutional profiles, to encourage institutions to focus efforts on their individual strengths, and develop incentives to support a diversity of strategic choices and to develop centres of excellence.
- Facilitate access to alternative sources of funding, including

using public funds to leverage private and other public investment (through match-funding, for example).

- Support the development of strategic and professional higher education leaders, and ensure that higher education institutions have the autonomy to set strategic direction, manage income streams, reward performance to attract the best teaching and research staff, set admissions policies and introduce new curricula.
- Encourage institutions to modernise their human resource management and obtain the HR Excellence in Research logo and to implement the recommendations of the Helsinki Group on Women in Science.

The landscape of Universities and the international e-learning dimension of higher education systems

European universities are characterised by a high degree of heterogeneity, which is reflected in organisation, structure, governance and operating conditions, including the status and conditions of employment and recruitment of teaching staff and researchers. There are some 3 300 higher education establishments in the European Union and approximately 4 000 in Europe as a whole, including the other countries of western Europe and the candidate countries. They take in an increasing number of students, over 12.5 million in 2 000, compared with fewer than 9 million ten years previously. They employ 34 % of the total number of researchers in Europe, with significant variations from one Member State to another (26 % in Germany, 55 % in Spain and over 70 % in Greece).

The European Union produces slightly more science and technology graduates than the USA, while having fewer researchers than the other major technological powers. This apparent paradox is explained by the fact that fewer research posts are open to science graduates in Europe, particularly in the private sector: only 50% of European researchers work in the business sector, compared with 83% of American researchers and 66% of Japanese researchers. Despite this, the universities are responsible for 80% of the fundamental research carried out in Europe.

Universities are essentially organised at national and regional levels

and seem to have difficulty in finding a truly European dimension. Student mobility, for instance, is still marginal in Europe. In 2000, a mere 2.3 % of European students were pursuing their studies in another European country. However, the EU funds a variety of initiatives to promote research, education and training at both European and international levels. In the area of research, European universities receive around one third of the funding available under the fifth (1998-2002) and sixth (2002-2006) framework programmes for technological research and development, and particularly the support actions for research training and mobility (Marie Curie actions). As far as education and training are concerned, universities are very much involved in all the actions of the SOCRATES programme, particularly the ERASMUS action. The LEONARDO programme supports projects on mobility between universities and the business sector, involving 40 000 people between 1995 and 2000. Universities are also involved in the eEurope initiative and its "eEurope 2005 Action Plan", which encourages all universities to develop online access (virtual campus) for teachers, students and researchers.

This cooperation also extends to other regions of the world. Most of the Community Research Framework Programme is open to every country in the world and in particular provides support for cooperation with the countries in the Mediterranean region, Russia, China and the newly Independent States, as well as developing countries. Through the TEMPUS programme the EU supports university cooperation with the countries of the former Soviet Union, south-east Europe and, since its extension in 2002, the Mediterranean region. There are also initiatives covering relations with other geographical areas, e.g. ALFA and Asia-Link.

How modernise the structure of higher education systems

Following all these considerations, Universities and higher education institutions are facing an imperative need to adapt and adjust to a whole series of profound changes:

- Increased demand for higher education. The low birth rate in Europe coincides with an increased demand for higher

education, which is expected to continue in the years ahead, firstly because of the policy adopted by certain governments of increasing the number of students in higher education and also because new needs are emerging in relation to lifelong learning.

- The internationalisation of education and research. European universities are attracting fewer students and in particular fewer researchers from other countries than their American counterparts. The former in 2000 attracted some 450 000 students from other countries, while the latter attracted over 540 000, mostly from Asia. However, the USA in proportion attracts many more students from other countries at advanced levels in engineering, mathematics and informatics, and are successful in keeping more people with doctorate qualifications: some 50 % of Europeans who obtained their qualifications in the USA stay there for several years, and many of them remain permanently. European universities in fact offer researchers and students a less attractive environment. This is partly due to the fact that they often do not have the necessary critical mass, which prompts them to opt for collaborative approaches, e.g. creation of networks, joint courses or diplomas. But other factors, outside the university, also play an important role, e.g. the rigidities of the labour market or a lower level of entrepreneurship entailing fewer employment opportunities in innovative sectors.
- To develop effective and close cooperation between universities and industry. Cooperation between universities and industry needs to be intensified by gearing it more effectively towards innovation, new business start-ups and, more generally, the transfer and dissemination of knowledge.
- The proliferation of places where knowledge is produced. The increasing tendency of the business sector to subcontract research activities to the best universities mean that universities have to operate in an increasingly competitive environment.
- The reorganisation of knowledge. This is to be seen in the increasing diversification and specialisation of knowledge, and the emergence of research and teaching specialities which are increasingly specific and at the cutting edge. It is also seen in the fact that the academic world has an urgent need to adapt

to the interdisciplinary character of the fields opened up by society's major problems, such as sustainable development, the new medical scourges and risk management. Yet the activities of the universities, particularly when it comes to teaching, tend to remain organised within the traditional disciplinary framework.

- The emergence of new expectations. Universities must cater for new needs in education and training which stem from the knowledge-based economy and society. These include an increasing need for scientific and technical education, horizontal skills, and opportunities for lifelong learning, which require greater permeability between the components and the levels of the education and training systems.

Universities and new challenges in financial-economic resources

Excellence in human resources depends largely on available financial resources, but is also affected by working conditions and career prospects. Generally speaking, career prospects in European universities, characterised by the multiplicity of configurations, are limited and shrouded in uncertainty. Traditionally, public funding is the main source of funding for research and education in European universities. Possible alternative financial sources are:

- private donations, as in the case of the United States;
- the sale of services (including research services and flexible lifelong learning possibilities), particularly to the business sector;
- contributions from students, in the form of tuition and enrolment fees. In Europe, these contributions are generally limited or even prohibited, in order to allow democratic access to higher education;
- application of the results of research and the creation of spin-off companies. Since the mid-1990s, the number of young technological ("spin-off") companies created by universities has been on the rise in Europe. Their average density nevertheless is far smaller than it is around the American campuses. A major obstacle to better application of university

research results is the way intellectual property issues are handled in Europe. In addition, European universities do not have well-developed structures for managing research results. They are less well developed, for instance, than those of public research bodies. Another contributory factor is the lack of familiarity of many university staff with the economic realities of research, particularly the managerial aspects and issues regarding intellectual property.

- Increasing universities' excellence in research and teaching. This Communication calls on European universities to identify the areas in which different universities have attained, or can reasonably be expected to attain, the excellence judged to be essential at European or at international level, in order to concentrate funding on them to support academic research. The concentration of research funding on a smaller number of areas and institutions will lead to increased specialisation of the universities, which will make it possible to obtain appropriate quality at national level in certain areas, while ensuring excellence at European level. In addition, to counter the current trend among European universities of recruiting people from the country or region in which they are established, or even within the institution itself, the Communication proposes to strengthen not only intra-European academic mobility, but also mobility between universities and industry, thus opening up new career opportunities for young researchers.
- Promote distance learning and opening up universities to the outside world and increasing their international attractiveness. For European universities, a broader international perspective means greater competition with universities on the other continents, particularly American universities, when it comes to attracting and retaining the best talent from all over the world. While European universities host almost as many foreign students as American universities, in proportion they attract fewer top-level students and a smaller proportion of researchers. All in all, the environment offered by the European universities is less attractive. Financial, material and working conditions are not as good, and arrangements with regard to visas and residence permits for students, teachers and researchers are inappropriate and poorly harmonised.

The regions of the EU are therefore called upon to play an important part in strengthening European cohesion through the development of technology centres and science parks, the proliferation of regional cooperation structures between the business sector and the universities, the expansion of university regional development strategies and the regional networking of universities.

Modernising universities and new technological-scientific innovation

In order for European universities to play a key role in achieving the strategic goal set at the Lisbon European Council, i.e. to make the European Union (EU) the most competitive and dynamic knowledge-based economy in the world, we have to point out the specific role of European universities in the knowledge society and economy. While the birth and growth of the knowledge economy and society rely on the combination of four interdependent elements, i.e. the production of new knowledge, its transmission through education and training, its dissemination through the information and communication technologies and its use through new services or industrial processes, it is Europe's universities which are the key players in this new process.

In this perspective, it is necessary to realise a stronger action at European level to implement the necessary reforms to modernise European universities. As key actors in a knowledge economy and knowledge society, universities face many challenges and have to make the necessary reforms to fully participate in the global market place in the fields of teaching, research and new technological-scientific innovation.

These reforms, which seek to restructure universities, concern in particular mobility, recognition of qualifications, autonomy, skills, funding, excellence and partnership with business. With 4 000 establishments, over 17 million students and some 1.5 million staff – of whom 435 000 are researchers – European universities have enormous potential. At the same time, higher education institutions too often seek to compete in too many areas, while comparatively few have the capacity to excel across the board. As a consequence, too few European higher education institutions are recognised as world class in the current, research oriented global university

rankings. the potential of European higher education institutions to fulfil their role in society and contribute to Europe's prosperity remains underexploited. Europe is no longer setting the pace in the global race for knowledge and talent, while emerging economies are rapidly increasing their investment in higher education institutions. In this perspective, we can identify certain challenges which the Member States and universities must face in order to modernise and restructure higher education and research and compete in the global competition:

- the standardisation of national university systems and their fragmentation into small structures, which make national, European and international cooperation more difficult and form an obstacle to their diversification and impede their quality;
- identical courses offered to similar types of student. Other types of training and other target groups tend to be neglected (conversion courses for adults or transition courses for those who have not followed traditional educational pathways);
- inflexible administrative regulations and long-winded academic recognition procedures. The problem of the transferability of scholarships or loans and pension rights is another obstacle to mobility, training, research or employment in another country;
- the development of the research environment into one which is open, interactive and competitive, transcending traditional structures;
- universities and business still underestimate the benefits of exchanging knowledge with each other or are not adapted to do so; lack of resources to ensure that the quality of higher education and research in Europe is comparable to that at American universities.

In this context, European universities are lagging behind in an increasingly competitive market to attract the best researchers and students. However, they need to develop their own potential fully and be able to do so. Even if they share certain values and objectives, it is not necessary to follow an identical model in terms of the balance between education and research, have a similar approach to research or research training or offer similar academic services

and subjects. Research must remain a fundamental mission of every education system, but it must be restricted to a limited number of establishments so as to better mobilise resources.

Changes and reforms to develop a new model of higher education systems

Removing obstacles faced by universities is vital to encourage and speed up mobility, both geographically and between sectors. This relates in particular to researchers. Advantage should be taken of the opportunities offered by mobility, a source of enrichment for study and work, but it must be made simpler by way of student grants and loans which are portable throughout the EU. The full transferability of pension rights and the elimination of all types of obstacles to occupational mobility between countries or between sectors, will also facilitate the mobility of staff and researchers, thus stimulating innovation. Essential reforms for the implementation of the Bologna Process are needed by 2010 throughout the EU. The main aspects are comparable qualifications (short cycle, Bachelor or equivalent, Master, Doctorate); flexible curricula which meet the needs of the labour market; and trustworthy quality assurance systems. These reforms should not only be based on best practices but also be launched by the national authorities to guarantee their implementation. In parallel, the recognition of academic qualifications should be simplified to ensure rapid procedures, following the example of the system for the recognition of vocational qualifications, which has recently been modernised and simplified. Universities must be autonomous and responsible in order to encourage innovation and resist change. This calls for a division of tasks between the Member States and universities. The Member States should establish the general framework (rules, policy objectives, funding, incentives). The universities should establish new governance systems based on strategic priorities and on the professional management of human resources, investment and administrative procedures. They should also reduce the fragmentation of their services and entities and assume responsibility for their results.

Incentives to encourage structured partnerships with enterprises will be needed to bring universities closer to the world of business.

Beyond their original mission, universities must realise their role as economic actors and be better equipped to meet demand from the market in order to increase the impact of their research. These structured partnerships must strengthen interactions between universities and enterprises (funding, opportunities for researchers, etc.). Incentives will therefore be essential to establish the necessary structures in universities, develop entrepreneurial spirit and management, business and innovation skills.

Universities must also provide knowledge and skills geared to the needs of the labour market. In other words, graduates' qualifications must meet the needs of the labour market. All levels of education are concerned, including adult education. This approach must be in line with the agenda on lifelong learning. Innovative curricula, teaching methods and continuing or refresher training courses combining general and specific skills will help to meet these needs. Universities must also embrace an enterprise culture, and placements in industry must be recognised so that they can be fully integrated into courses. In this context, access to the labour market should serve as an indicator of the quality and performance of universities. This means, for example, that doctoral candidates wishing to work in research must acquire, in addition to their research training, skills relating to the management of intellectual property rights, communication, working in a network, entrepreneurship and team working.

University funding must be reformed so that a level of teaching and research excellence can be achieved in accordance with the Lisbon Strategy, the aim of which is to commit 2% of gross domestic product (GDP) to a modernised higher education system by 2010. Moreover, universities should fully assume their role in European research by way of more investment (the objective is to invest 3% of GDP in research and development by 2010). In parallel, the funding of students should be amended to ensure greater fairness between students, in particular those coming from disadvantaged backgrounds, as regards university admittance and chances of success.

For this reason, the funding should be results-oriented, rather than resources-oriented. It should also be more diverse and include more private funding, especially for research. A good balance between basic funding and funding resulting from calls for tender or linked to results will therefore be necessary. Moreover, this second category of funding must be based on performance indicators in

order to clearly measure the relationship between resources invested (inputs) and results obtained, both economic and social (outputs). In this way, universities will be more responsible for their own financial viability.

Interdisciplinarity and transdisciplinarity are vital for universities, which have to adapt to new opportunities and new issues arising from trends in each field. Universities will therefore have to redefine their education and research priorities by focusing more on research fields than scientific disciplines. They must also encourage student, researcher and research team mobility in order to generate more interactions between them. To this end, universities will have to revise their structures and organisations (staff management, evaluation, funding, teaching, etc.).

Universities must promote knowledge by achieving greater involvement of all parts of society. In a knowledge-based society, it is vital for universities to step up communication and dialogue with those affected by their activities and with the whole of society, by way of conferences, open days or forums. They will thus gain credibility and attract more investment. They must also offer lifelong learning opportunities.

Universities must also concentrate on the development of excellence. The attractiveness of universities will be enhanced by the concentration of resources, mobility and increased competition. However, whilst attracting researchers and students, they must also establish flexible and transparent recruitment procedures, ensure research independence and offer attractive career prospects. Excellence also means favouring certain fields. Excellence encourages the development of networks of postgraduate or doctoral institutions which must meet certain key criteria, such as critical mass, transdisciplinarity and interdisciplinarity, the European dimension, the support of public authorities and enterprises, identified and recognised fields of excellence, a range of post-doctoral studies and a reliable quality assurance system. The creation of the European Institute of Technology and the European Research Council is in line with this strategy.

The visibility and international attractiveness of the European higher education area and the European Research Area are essential to strengthen the role of universities and European research in the world. However, to be competitive, their role, openness and quality have to be stepped up. In this context, experience gained

by universities in cooperation (consortia, agreements, double degrees), networking and mobility deserve to be further developed beyond Europe. Cooperative ventures should be better structured and supported by appropriate funding and bilateral or multilateral agreements. Openness to the world also means attracting non-European students, teachers and researchers and encouraging European student, teacher and researcher mobility outside Europe. In this context, it is vital to simplify and speed up the administrative and legal entry procedures for students and researchers from outside the EU. The entry and residence of researchers from third countries have already formed the subject of a package of measures for the issue of visas for researchers in 2005. Recognising qualifications is another essential aspect of the global visibility and attractiveness of European higher education and research. Following the example of the recognition of vocational qualifications, the recognition of academic qualifications should also be encouraged. The European qualifications framework and compatible quality assurance systems mark the beginnings of this. Moreover, double degrees and joint degrees issued by consortia of universities could also be extended and built upon.

In this perspective, the EU Commission's proposal for the Multiannual Financial Framework 2014-2020 wants to support a strategy with a significant increase in the budget devoted to economic-financial investment in higher education systems, research and innovation. The EU Commission is providing political backing with the open method of coordination which Member States use. This allows the identification and dissemination of good practices and support for Member States in the pursuit of more effective university systems. The Commission wants to provide funding to step up the quality and performance of universities. This funding includes the programmes for the period 2014-2020 (the 7th framework programme for research and development, the lifelong learning programme, the Competitiveness and innovation programme), the Structural Funds, focusing on the least developed regions, and loans from the European Investment Bank. Moreover, the creation of the European Technology Institute will meet the objectives set out in this communication, in particular because it will be focusing on excellence, interdisciplinarity, networks and cooperation between the academic and business worlds. In this perspective, the EU Commission also emphasises the importance of coordinating

all those concerned in the restructuring and modernisation of universities. The Member States must take these challenges into account when they implement the integrated guidelines for growth and jobs and the national reform programmes. Universities must make strategy choices to respond to them.

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Sintesi

In una società in costante trasformazione tecnologica e scientifica, di fronte ad una domanda di istruzione superiore che, sotto la spinta della globalizzazione, risulta negli ultimi venti anni in costante ascesa, la crisi economica mondiale ha determinato una riduzione consistente dei finanziamenti destinati alle università. In questa prospettiva, lo studio propone nuove strategie per innovare il sistema tradizionale dell'istruzione superiore, sulla base sia della più recente letteratura critica, sia di una ricognizione comparativa delle principali riforme attuate in molti paesi nei cinque continenti. Quale impatto avrà la crisi economico-finanziaria mondiale sulla struttura dei sistemi di istruzione superiore? Come è possibile modernizzare la struttura dei sistemi di istruzione superiore? È possibile definire e sviluppare un nuovo modello di istruzione superiore? Quali saranno le conseguenze a medio e a lungo termine per la qualità e la competitività dell'istruzione superiore, considerati gli obiettivi programmatici della strategia per lo sviluppo sostenibile Europa 2020 che sarà basata, tra l'altro, sulla ricerca, l'innovazione e l'istruzione? In questo orizzonte di ricerca, lo studio analizza, in particolare, le seguenti aree tematiche:

- *Valutare e migliorare la qualità dei sistemi di istruzione superiore.*
- *Ideare nuove strategie nel reperimento e nell'uso di risorse finanziarie per l'istruzione superiore.*
- *Incrementare le università e la dimensione internazionale dell'e-learning nei sistemi di istruzione superiore nei cinque continenti.*
- *Modernizzare la struttura dei sistemi di istruzione superiore.*
- *Valutare l'impatto della crisi economico-finanziaria mondiale sulla struttura dei sistemi di istruzione superiore.*
- *Favorire il confronto nei cinque continenti: nuovi orizzonti nell'impiego di risorse economico-finanziarie.*
- *Modernizzare le università seguendo le nuove innovazioni tecnologico-scientifiche.*
- *Introdurre riforme e strategie innovative per definire e sviluppare un "nuovo modello di istruzione superiore".*