Quality and Leadership
for Romanian Higher Education

The future state of higher education in Europe

Mini-scenarios for 2025

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1. Introduction

This report brings alternatives views on the future of higher education in Europe, based on an online survey among senior university managers and university researchers in Europe. It serves as an input for the vision building process for the future of higher education in Romania, as part of the project "Quality and Leadership in higher education in Romania".

The report starts with an outline of the methodology applied during the data collection. As a first part of the results the next session looks at the wider context of universities in Europe, and relates the views of university managers regarding the role of universities in their country/region in addressing societal challenges to the Europe 2020 strategy. The next chapter goes more into detail, and gives an overview of the main findings of the survey in terms of issues that possibly shape the future of higher education in Europe, by presenting them in a set of scenarios. The most likely scenario is then translated into possible actions, using as a framework the policy priorities proposed by the European Commission in its Modernisation Agenda for universities in Europe. A concluding section translates those findings into guiding questions in support of the vision building process for the future of higher education in Romania.

2. Methodology

The survey was directed towards two target groups: senior university managers, and university researchers. Below some background information is given on the data collection for both surveys.

2.1 Survey to senior university management

What is a senior manager?

Senior university managers are those persons who have the power and responsibility to make decisions to manage (organise and coordinate) the university as a whole (e.g. President, Rector or Principal), a distinct unit of the university (e.g. Director of a School, Dean, Head of Departments), or concrete responsibilities for a functional area (e.g., Vice-President for Research, Vice-Rector of External Relations, Head of Accounting Department).

Selection of universities

For the survey the list of 200 research-active universities from the University Observatory were used. It includes universities from 33 ERA countries (27 Member States and Croatia, Iceland, Israel, Norway, Switzerland and Turkey). The number of universities per country has been calculated by using an H-Index[1] that measures both the scientific productivity and the impact of publications. The number of universities per country was calculated according to country's position in the scientific production index. Other alternative criteria were also checked (e.g. total public expenditure on education at tertiary level of education (ISCED 5-6) (millEuroPPS 2005), relative levels (% GDP), GERD (2006), or productivity per R&D investments) but they showed more skewed results.

The particular universities within the country were selected by using their Institute for Scientific Information (ISI) academic output in 2008. Only articles linked to a university address from the selected country in 2008 where exported. The selection included the three ISI databases: SCI-EXPANDED, SSCI, A&HCI.

As the use of one year total production as criterion for the selection of universities could be considered limited, we assured that the top European Universities (according to Shanghai[2], Leiden[3] and Times[4] ranking) were included in the sample. That is to say, if the university appeared simultaneously in the three mentioned

[1] The H-index is an index that attempts to measure both the productivity and impact of the published work of a scientist or scholar. The index is based on the set of the scientist's most cited papers and the number of citations that they have received in other people's publications. The index can also be applied to the productivity and impact of a group of scientists, such as a department or university or country.
[2] The Academic Ranking of World Universities (ARWU) is produced by the Center for World-Class Universities and the Institute of Higher Education of Shanghai Jiao Tong University, China.
[3] The Leiden ranking is produced by the Centre for Science and Technology Studies (CWTS), Leiden University, The Netherlands.
[4] The Times Higher Education World University Ranking.

rankings but not in our initial selection, the university was included as part of the study. As a result, the final number of universities assigned by country increased for France, Germany, Sweden and the UK. To ensure institutional diversity and national representativeness of all ERA countries, a minimum of one university per country was guarantee. For the same reason, we have accepted all the changes of universities suggested by the country correspondents that were within an interval of 1% of the relative production of the universities of the country.

Response rate

From the universities selected above, around 1200 e-mail addresses of senior managers were collected that were available on the university websites. 144 senior managers participated in the survey.

Country of university location	Number of senior university managers participating
Unknown	6
Austria	12
Belgium	5
Bosnia and Herzegovina	1
Bulgaria	1
Czech Republic	4
Denmark	5
Estonia	1
Finland	6
France	5
Germany	8
Greece	5
Hungary	2
Ireland	3
Israel	2
Italy	12
Latvia	1
Lithuania	1
Luxembourg	3
Netherlands	3
Norway	6
Poland	2
Portugal	4
Slovenia	2
Spain	13
Sweden	9
Switzerland	5
Turkey	3
UK	14
Total	*144*

Table 1: Number of senior managers that participated in the survey, by country of location of the university (EU MS in bold).

Participants' job title

Below the job title of the participants is displayed.

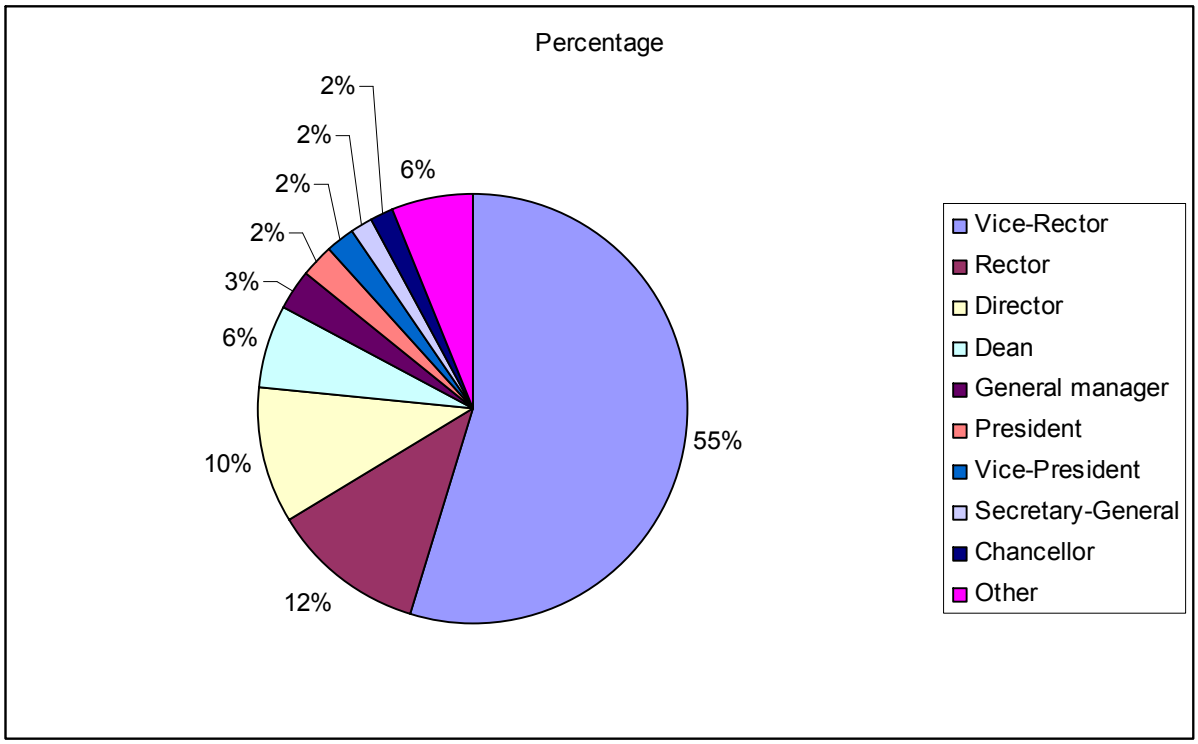


Figure 1: Job titles of participants in the survey directed to senior university managers

2.2 Survey to university research and teaching staff

What is university research and teaching staff?

University research and teaching staff are those who are currently working, or who have previously worked, in universities or affiliated institutions with responsibilities for research and/or teaching activities (e.g. Teacher, Professor, Researcher).

Selection of researchers

For the survey a database of around 4000 researchers from Europe and beyond has been used. In addition LinkedIn was used to promote the survey among university researchers.

Response rate

308 researchers participated in the survey. There is a very high representation of researchers at Belgian universities, probably due to the use of LinkedIn.

Country of university location	Number of researchers participating
Unknown	14
Australia	1
Austria	7
Belgium	122
Bosnia and Herzegovina	0
Brazil	4
Bulgaria	7
China	0
Croatia	4
Cyprus	0
Czech Republic	1
Canada	4
Denmark	2
Estonia	0
Finland	10
France	9
Germany	11
Greece	12
Hungary	3
Iceland	1
Ireland	2
Israel	1
Italy	8
Japan	0
Kosovo under UN Security Council Resolution 1244	0
Latvia	4
Lithuania	0
Luxembourg	1
Malta	1
Montenegro	0
Netherlands	6
Norway	3
Other	6
Poland	3
Portugal	6
Romania	7
Russia	1
Serbia	0
Slovakia	0
Slovenia	5
Spain	19
Sweden	3
Switzerland	4
The former Yugoslav Republic of Macedonia	0
Turkey	1
United Kingdom	12
USA	3
Total	*308*

Table 2: Number of university researchers that participated in the survey, by country of location of the university (EU MS in bold).

3. Universities and societal challenges

Universities in Europe have a third mission, which cannot be disconnected from the other two missions (research and teaching), and which focuses on engagement with wider society. This third mission can relate to technology transfer to industry, participation in policy making or in public engagement and societal debate, etc. One of the objectives of the analysis is to understand better the importance of this third mission.

An important element of the third mission is the role of universities in addressing societal challenges. Senior university managers were asked to indicate the societal challenges which should have the highest priority for universities in their country/region. Answers to this open question have been grouped according to the pillars of the Europe 2020 strategy, which represents the new European agenda for the next ten years, as stated in COM (2010) 20205. The annex 1 of this communication gives an overview table of Europe 2020. This agenda puts forward three mutually reinforcing priorities (Smart Growth, Sustainable Growth, Inclusive Growth) which are further divided into seven flagship initiatives to catalyse progress under each priority theme. The seven flagships are described in table 3 below.

ANNEX 1 - EUROPE 2020: AN OVERVIEW

HEADLINE TARGETS		
– Raise the employment rate of the population aged 20-64 from the current 69% to at least 75%. – Achieve the target of investing 3% of GDP in R&D in particular by improving the conditions for R&D investment by the private sector, and develop a new indicator to track innovation. – Reduce greenhouse gas emissions by at least 20% compared to 1990 levels or by 30% if the conditions are right, increase the share of renewable energy in our final energy consumption to 20%, and achieve a 20% increase in energy efficiency. – Reduce the share of early school leavers to 10% from the current 15% and increase the share of the population aged 30-34 having completed tertiary education from 31% to at least 40%. – Reduce the number of Europeans living below national poverty lines by 25%, lifting 20 million people out of poverty.		
SMART GROWTH	SUSTAINABLE GROWTH	INCLUSIVE GROWTH
INNOVATION EU flagship initiative "Innovation Union" to improve framework conditions and access to finance for research and innovation so as to strengthen the innovation chain and boost levels of investment throughout the Union.	*CLIMATE, ENERGY AND MOBILITY* EU flagship initiative "Resource efficient Europe" to help decouple economic growth from the use of resources, by decarbonising our economy, increasing the use of renewable sources, modernising our transport sector and promoting energy efficiency.	*EMPLOYMENT AND SKILLS* EU flagship initiative "An agenda for new skills and jobs" to modernise labour markets by facilitating labour mobility and the development of skills throughout the lifecycle with a view to increase labour participation and better match labour supply and demand.
EDUCATION EU flagship initiative "Youth on the move" to enhance the performance of education systems and to reinforce the international attractiveness of Europe's higher education.	*COMPETITIVENESS* EU flagship initiative "An industrial policy for the globalisation era" to improve the business environment, especially for SMEs, and to support the development of a strong and sustainable industrial base able to compete globally.	*FIGHTING POVERTY* EU flagship initiative "European platform against poverty" to ensure social and territorial cohesion such that the benefits of growth and jobs are widely shared and people experiencing poverty and social exclusion are enabled to live in dignity and take an active part in society.
DIGITAL SOCIETY EU flagship initiative "A digital agenda for Europe" to speed up the roll-out of high-speed internet and reap the benefits of a digital single market for households and firms.		

Table 3: The three priority themes and the seven flagship initiatives of Europe 2020 (Source: COM(2010) 2020: Europe 2020 - European strategy for smart, sustainable and inclusive growth. Annex 1 – Europe 2020: An overview).

[5] COM(2010) 2020: Europe 2020 - European strategy for smart, sustainable and inclusive growth.

Societal challenges of European universities and Europe 2020

Smart growth	Sustainable growth	Inclusive growth
INNOVATION (16) Contribute to and increase innovation; develop research priorities; transfer knowledge with economic and social value; create new innovations for companies and spin offs; access of small businesses to research; technological innovation and sustainability; how to become a knowledge society; help the region to dramatically improve the technological level of the industry; help change the economic paradigm of the country from a low wages one to an added value one based on knowledge; explain the value of research for the benefit of society; centre of research and innovation; link economy – innovation.	*CLIMATE, ENERGY AND MOBILITY (16)* Understanding, mitigating and responding to climate change; the production and use of the energies (renewable or not...); the environmental challenges; sustainable development - natural resource savings - mind set & behavioural changes; energy consumption/production; Deal with complexity and uncertainty in a way that contributes to sustainable development at different levels of scale, from local to global; biotechnologies; Agriculture and nutrition; world's resources; energy resources; environmental issues; energy; environment and energy.	*EMPLOYMENT AND SKILLS (10)* Reduce unemployment rate; improve employability; rationalise the labour market; increase employment; prepare well educated graduates with the balanced knowledge of the core engineering experience and soft skills; Life Long Learning; educate people for companies and public services; contribution to develop a high skilled technological industry; access to employment for graduates.
EDUCATION (10) Educate; reduce drop out rates at basic and secondary schools; make universities productive; internationalise the curriculum, the student body, staff and research; streamline the number of academic institutions to a reasonable one and fund only the best; equal education; be a driver of research driven education; show that different type of HEI´s have different mission/roles in the society and that the "accountability" of the university is not only a matter of cost-benefit thinking; focus on teacher's education;	*COMPETITIVENESS (9)* Contribute to welfare; increase the competitiveness of our economy and by such a way to help the solution of the most important problems (unemployment, low pensions, poor health care etc.); sustainable economic growth; support the development of new industries; support to sustainable economy and society; increase economic prosperity; increase public understanding about the role of universities for future welfare and economic development; contribute to economic growth and development of the region; contribute to entrepreneurship; be able to respond to the changing market environment.	*FIGHTING POVERTY (5)* The challenges of a just society; social cohesion; social issues; help the poorest and least advantaged in society; address poverty.
DIGITAL SOCIETY (3) Social/individual impacts of new technologies (Robotics,…); IT and society; approach technology in a cultural way.		

OTHER: HEALTH (7) Personalised medicine; medical and health care challenges; healthcare service; health system, Alzheimer.
OTHER: AGING (7) Demographic change; aging of society; Ageing population.
OTHER (20) Work on a new spirit neglecting economical values as the first goals in life; contribute to the cultural development of the country; contribute to a free, open and democratic society; security and trust in telecommunications; rational way of thinking and analysing problems; opinion leadership; ignorance and injustice; establish the rule of law; European integration and nationalism; law and economics; migration and cultural divides; globalisation and the new cosmopolitanism we are living today; religion and tolerance; post-capitalism; equity between Man and Woman; cultural awareness; bio ethics; participation and integration of migrants; integration; democratic issues.

Table 4: Societal challenges that senior university managers in Europe consider should have the highest priority for universities in their country/region, grouped by Europe 2020 priority themes and flagship initiatives. Survey among sample of 200 research intensive universities. Answers are from 59 senior university managers in the EU, representing at least 52 universities (5 cases from the same university, and 2 anonymous answers).

Societal challenges of universities that come up from the survey have been organised according to the seven flagships (see table 4). Societal challenges mentioned that do not seem to relate to one of the flagships are grouped into 'Other'.

Although many of the challenges mentioned relate to more than one flagship initiative and more than one priority theme, each challenge mentioned has only been assigned to the flagship initiative to which it relates most according to the description in annex 1 of the Communication. This is in line with the mutually reinforcing nature of the priority themes. The numbers between brackets behind each flagship initiative represent the number of university managers that mention a societal challenge that relates to that initiative. The number of examples of challenges given for each challenge can be lower, as some managers mention the same challenges.

From the table the following can be noted:

- There is a wide variety of challenges mentioned in each of the three priority themes and each of the seven flagship initiatives. This supports the scenario of the differentiated university landscape.
- 103 challenges are mentioned, representing at least 52 universities. The average number of societal challenges for each university is around 2.
- The distribution of challenges over the three priority themes is quite balanced, although with a slightly stronger focus on priority theme one and two. The flagship initiatives with the most related challenges are innovation and climate, energy and mobility. Also challenges related to education, competitiveness and employment and skills are mentioned quite often. Challenges related to fighting poverty and to the digital society are less often mentioned than some of the other. Other challenges mentioned can be grouped into 'health', 'aging', and 'other', which contains challenges that relate to values and democracy, integration, globalisation,...

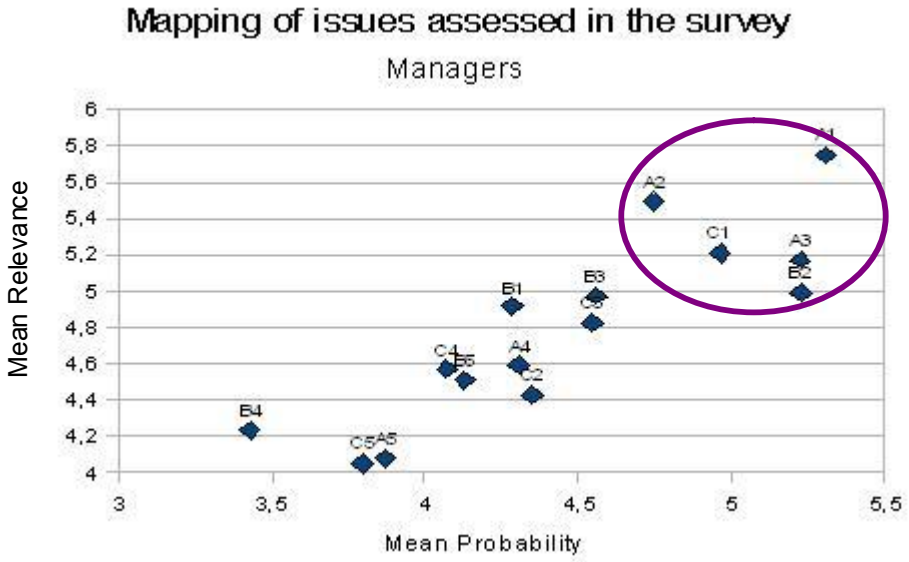
Finally it should be mentioned that some universities deliberately did not mention societal challenges, because they do not support the idea of universities addressing current societal challenges.

4. Scenarios for the future of universities in Europe

4.1 The likely mini-scenario: "the global university"

The building blocks of the mini-scenario

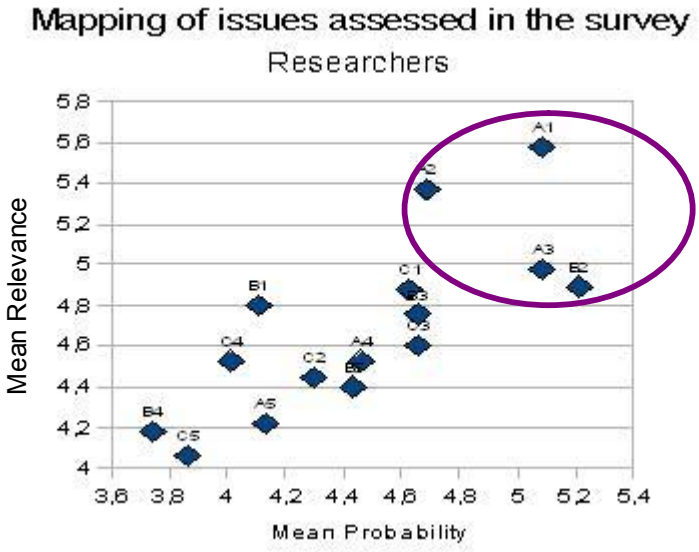
When mapping all issues assessed by university managers based on their mean probability and mean relevance, some issues appear as highly probable and relevant (see graph 1a). It concerns the issues listed in table 5. Graph 1b maps the assessment of the same issues by researchers. The most probable and relevant issues according to this target group seem to be the similar to the assessment of managers, i.e. there is a high consensus among both target groups that those issues are both very relevant and very likely to happen. It can therefore be interesting to bring these issues together in a 'likely mini-scenario' for the future of higher education.
Three out of the five issues being looked at relate to (the adaptation to) globalisation. A scenario combining these issues could therefore be labelled "the global university".



Graph 1a: Mapping of issues assessed by university managers according to mean probability and mean relevance

Issue Code	Issue description
	A. The Future State of Globalisation
A.1	By 2025, higher education institutions will have become globally competitive and thus able to cope with people of many different nationalities and cultural backgrounds.
A.2	By 2025, emerging regions in Asia and elsewhere will have become the most important centres of research and innovation.
A.3	By 2025, virtual higher education and research organisations are established, taking advantage of advanced computing, global networks of interdisciplinary teams and a mix of skills.
	B. The Future State of Mobility
B.2	2/ By 2025, today's less developed economies will continue to face brain drain, low science-innovation links and an ever-widening technological gap with the rest of the world.
	C. The Future State of 'Third Mission of Universities'
C.1	1/ By 2025, societal needs and values will be the most important drivers of research and innovation.

Table 5: most relevant and most probable issues shaping the state of universities in 2025 according to university managers and researchers



Graph 1b: Mapping of issues assessed by university researchers according to mean probability and mean relevance

Variations to this mini-scenario

This scenario is of course a mini-scenario which does not capture all possible drivers for change, but focuses on some very relevant ones. This scenario can be further refined by combining it with mini-scenarios that were submitted by senior university managers. From those individual scenarios, those that relate to a certain extent to the issues selected above are listed below.

1. The global university - variations

Shared virtual reality spaces for research. Time zone problems. Avatars. Classroom settings, similar to today's.

More open, more intense use of Internet, more intense research activities, student innovation will flourish, more flexible education schemes.

Research, always, in collaboration in nets of excellence.

Innovation, always, under discussion.

Education in person, but international knowledge through international networks.

More specialized, more competitive, more electronic education, more interest in talent development

A market, with networks of alliances among competitors ("coopetition")

University as its name say may be Higher education universal centres. Any people of any country may study in any University. Students will be accepted because their own knowledge, skills, etc. proved by a universal test. Research will be universal too in the same way.

Universities will have an integrated structure and with efficient managers; a member of many different networks with common projects and using the common resources (teaching staff, lab equipment etc.).

The HEI will be bigger than today and we will see an increase in fusions between HEI's. We will give more credit to persons who are innovative so that they can compete in order to hold positions as professors. Education is still mainly carried out on campuses even though some parts of the training are conducted online in order to make education available to a greater number of students. Researchers will still be at the campus - Cambridge believes that the number of Nobel Laureates they have is due to their cantina! There is where all the brains meet!

Universities have an essential role as independent knowledge institutes within all kinds of networks. They produce knowledge in cooperation with other institutes (both public and private) and are necessary centres of knowledge working in the 21st century.

In 2025 European universities will be more intensive in research and innovation with professors with high skills in ICT for online teaching and virtual collaborations in R+D.

4.2 The debated mini-scenario: "The open university?"

The building blocks of the mini-scenario

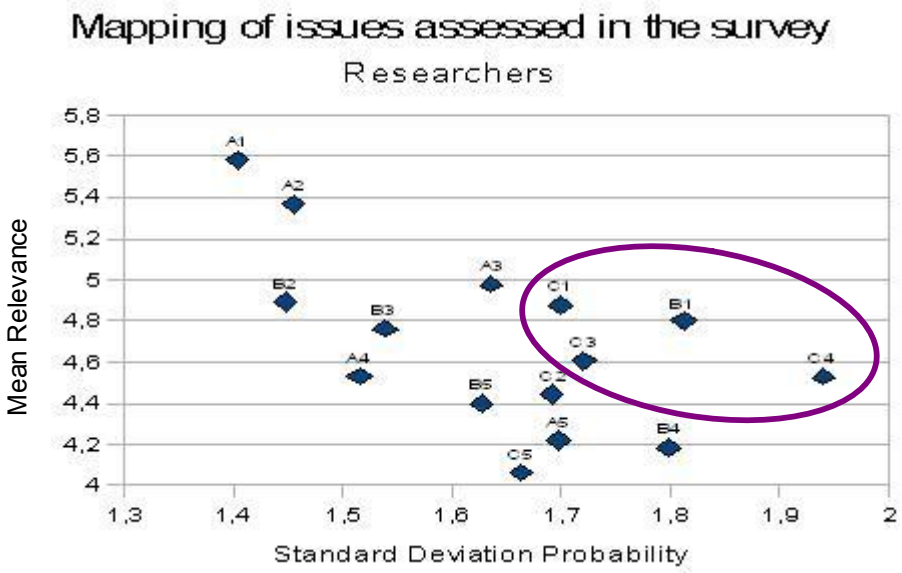
A second way of looking at the issues assessed relates to the divergence in opinions on whether an issue is likely to happen. Graph 2a and 2b map the issues assessed according to Standard deviation of probability and mean relevance. Both target groups coincide in the way they identify the most debated issues. It concerns issues B1, C3 and C4. Among researchers also B4 appears to be highly debated, but is assessed as being less relevant. Issue C1 seems to be seen by researchers as relevant and debated too.

The issues concerned are listed in table 6. The common ground of these issues is that they are all seen to be (highly) debated by university managers and researchers. It can therefore be interesting to bring these issues together in a 'debated mini-scenario' for the future of higher education.
Most issues being looked at relate to either third mission or universities competing (for researchers and with alternative education systems). In a sense this all has to do with the degree to which universities open up to incorporate societal needs, stakeholders' opinions, alternative modes of education, open innovation, etc. A scenario combining these issues could therefore be labelled "the open university?" (with a question mark to indicate the debated nature of the scenario).

Graph 2a: Mapping of issues assessed by university managers according to standard deviation of probability and mean relevance

	B. The Future State of Mobility
B.1	1/ By 2025, several European countries will face a substantial decline in the number of researchers and PhD students.
B.4	*4/ By 2025, alternative education systems (online education, distance education, competition from foreign universities) will have replaced substantially the traditional higher education system in several European countries.*
	C. The Future State of 'Third Mission of Universities'
C.1	1/ By 2025, societal needs and values will be the most important drivers of research and innovation (mainly according to researchers).
C.3	3/ By 2025, different stakeholders such as politics, university, industry and representatives of civil society are highly involved in research and innovation through online networks.
C.4	4/ By 2025, the protection of intellectual property will have become to a great extent irrelevant, as successful innovation will have come to depend more and more on knowledge sharing and open innovation.

Table 6: most debated issues (probability) shaping the state of universities in 2025 according to university managers and researchers (issues in italic are assessed as being less relevant)



Graph 2b: Mapping of issues assessed by university researchers according to standard deviation of probability and mean relevance

Variations to this mini-scenario

From the individual scenarios of senior university managers submitted, those that relate to a certain extent to the issues selected are listed below.

2. The open university?

There will be stronger research and knowledge transfer links between universities and industry / commerce. Universities will improve at making sure that their graduates have the skills needed to thrive in tomorrow's workplace.

Influenced by the market, money depended, competitive with regards to funding, getting away from pedagogy.

Universities in 2025 will look like the capitalism of the early 20yh century.

Science and industry-relevant disciplines will have increasing importance, but in the next decade Europe should take care of its cultural potential. Culture is not only a positive "tourist effect", but is highly socially relevant, especially in European culture. This is one of our unique features and we should save this cultural aspect.

There will be more integration between universities and society at large.

The components of knowledge triangle will feed back each other in a more comprehensive way than today. However, we will need more competent ways to handle the relation among them through more participatory governance schemes.

EU Universities will keep equilibrium in the triangle, keeping momentum in basic research and on selected applied science themes where the future of mankind is concerned (eg: energy, environment).

Universities will be integrated and open with extensive collaboration with industry

Today's models will coexist with new models, e.g. research being conducted side by side with spin-off companies, mode 2 research and triple helix models. Also, students will take more part in research activities and/or practical company training during their program. Traditional boundaries between basic and applied research, teaching, implementation and between universities, companies and the public sector will be challenged.

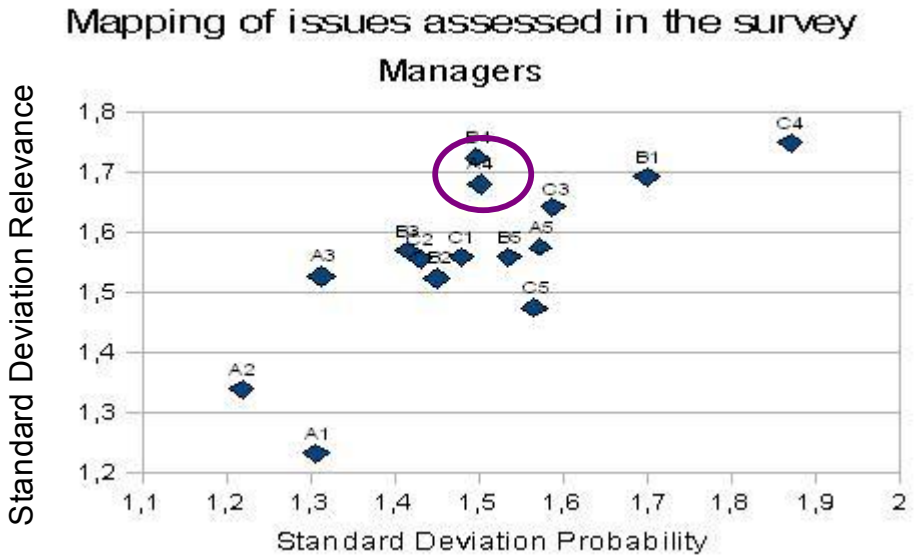
Universities know how to work with knowledge management which will give them good possibilities to collaborate both with other universities and with industry and the public sector. We will have good entrepreneurial education programs, and the attitudes to innovation have changed in a positive way also for humanities.

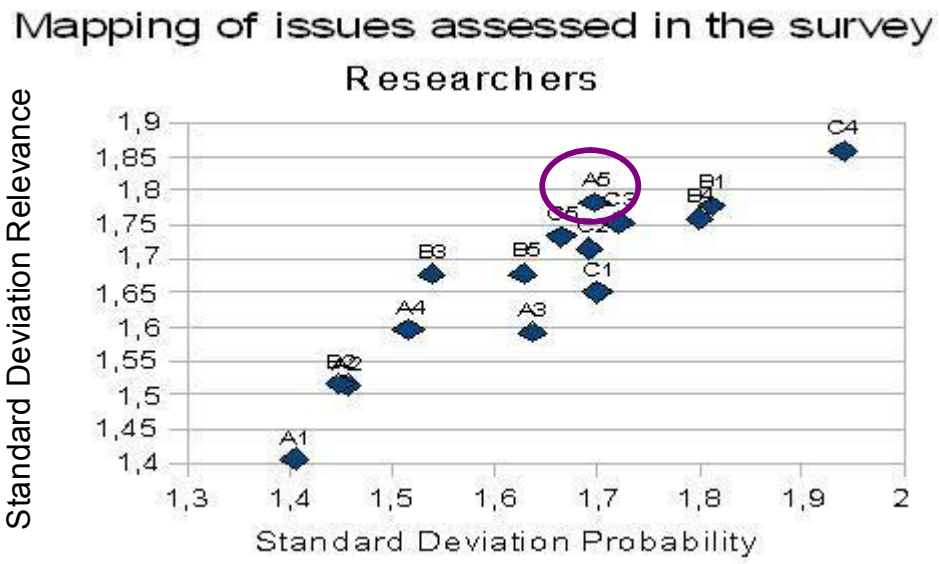
The triangle will have strong ties, precisely at the doctorate level, at all the universities that would have followed the adaption to respond to the society needs.

There will be more use-inspired research, more interdisciplinary projects and greater engagement of practitioners in research and teaching at Universities without stigma.

4.3 The differentiated university landscape

Looking at the differences in opinions as regards relevance, two more relevant issues in the debate can be detected (see graph 3a and 3b). In addition to the issues in table 6, senior university managers seem to have quite strongly diverging views on the relevance of issue A4 and researchers on the relevance of A5 (see table 7).





A.4	By 2025, competitive regions will have specialised in one or a small number of specific knowledge-oriented sectors.
A.5	By 2025, the assessment and certification of knowledge by peers in informal international networks (e.g. through social computing) will have become more important than the role of established institutions.

Table 7: most debated issues (relevance) shaping the state of universities in 2025 according to university managers and researchers.

This scenario touches upon an element of specialisation. Senior university managers also proposed a wide set of other forms of specialisation (see below). This again shows the widely differing views on this issue. There is hardly any common ground for all these variations to specialised universities, apart from the fact that they all show a differentiated university landscape in 2025. As issue A5 (table 7) is quite strongly debated, peer review through informal networks can also be seen as a way for universities to specialise/differentiate.

Variations to this mini-scenario

From the individual scenarios from the senior university managers submitted, those that relate to a certain extent to the issues selected are listed below. The number of contributions in this area shows that the issue of differentiation is highly debated.

3. The differentiated university landscape

There will be maximum 3-4 very good, research-oriented departments in each field in each country and a large base of primarily education-oriented colleges and universities with minor research functions. As governments will withdraw increasingly from research and education funding for lack of financial resources, university research will be increasingly dependent on outside funding.

Education will be dominant and research concentrated to fewer institutions, where innovation will play an important role.

I think there will be an inevitable internal differentiation. Some universities (or parts of them) will specialise in advanced research and doctoral training, others on lower-level training and LLL, others still on applied research and contribution to local development.

There will be more industrial project than today, less money sent by government and less stable position at universities.

The sector will be diversified even further, with clear identification of world leading, research-led universities and others which have a different mission (e.g. 3rd stream).

Modes of study are more flexible and delivery innovative, involving greater use of technology/electronic means.

They will be more like the successful British and US universities today.

Not hugely different from today except that there will be greater differentiation between a small number of leading and the large number of other universities.

By 2025, universities will be involved in consortium (both at the regional and subregional levels) of high education and research, each partner having its own specific competences

A bigger difference will exist between the top universities and the second and third tier.

We will have in Europe few excellent universities which should attract the student from the global world. These universities will also have strong fundamental research sponsored by EU money. Technology transfer will be one of mayor generators for national economy. Several local universities which will have less students and less scientific output will educate population to serve the less knowledge based processes.

If we´ll succeed the diversification, i.e. re-stratify the world of the tertiary and conserve the traditional nature of some of them (that of the useless "truth seekers") without denying the access of many to some type of the HEI´s, the research and the education will be in balance. Europe will have about 20-30 mega mergers centres, then about 10% of traditional universities/country and the remaining HEI´s, centres and schools. The innovation after a period of de-mystification will concentrate to specialized schools and to mergers.

Senior professors teach more; junior researchers teach modestly and get opportunities to innovate research . Students evaluate their teachers, but are bound by evaluations of their own work on a peer review regular basis. The peer review will preferably be done in other institutions than their own.

Range of varieties, strong research universities, education-focussed universities.

Given the public money bags, Europe will be proud to have been able to increase the number of existing top universities by a few more. These premier league institutions will be able to compete on an international scale. Moreover a large(r than today) number of institutions will exist with a high reputation and with a rather focussed research and teaching portfolio. These two categories together will make the knowledge triangle work, particularly if they are located in major industrial regions. The others are more or less production sites for undergraduates and graduates hopefully to be taken up by the labour market - but they have to return due to the necessity of lifelong learning.

Research: 50% - Education: 40% - Innovation: 10%.

There are two scenarios:

1. The European university system will look more like the US, with 10 or 20 key players competing with the US and Asia in research, another 100 or so high quality places, and the next 1000 being mostly focused on education. This would allow Europe to stay competitive world wide
2. There will be 2000 average or mediocre places.

We will have strong and well identified research universities on one hand and higher education colleges in the other hand to assure mass education. Except for strong universities having important funding the innovation will take place in private structures.

Smaller, clearly divided into top-research and applied-research/basic teaching schools, the former national leaders on the Shanghai list, the latter local workforce pools. But universities in both groups will be smaller, with less people than now; the latter because of productivity and demography require less workforce, the former because they specialise even further than today. The economies of size that were relevant in the 1900s are not any more.

Research will be more concentrated in a few leading universities which compete globally. Many institutions will be teaching-only.

Probably there will be a small number of elite institutions and many of the others focusing on mass education..

Different conditions. Some strong universities will become more than now the drivers of local and regional development, bridging among territories at the national and international level. Many other universities will become weaker, under-funded, run by private concern,

specialized only in education like today many universities in the USA.
There will be a distinction between research intensive universities and universities with a role that relates either to teaching/training or to the transfer of the universities' knowledge to regional economies
European Universities will have more differentiated missions, will cooperate more strongly with regional and national society, will be more integrated in transnational and transcontinental networks and will have a larger proportion of students coming from outside Europe
Not all universities will be able to maintain all three. University clusters/networks can provide competitive opportunities where they agree their complementary strengths.
There will be a larger variety of institutions for higher education: institutions leading to bachelor degrees, partly with long distance education, a smaller number of research universities with doctoral degree programs of high reputation, and some research centres that should link with the research universities.
There will be no "European University". In common to most (not all) will be a strong link between education, research and application (incl. when suitable commercialization of innovation). Some institutions will, however, be mostly research oriented.
European universities are so different! The most successful way will be the support of best people.

4.4 The knowledge triangle becomes reality

Some proposed mini-scenarios see a strong knowledge triangle, integrating research, education and innovation. Among the variations proposed are the following:

4. The knowledge triangle becomes reality

There will be a tighter and denser interaction between the three nodes of the knowledge triangle but the difficulties associated with the governance and management of the knowledge triangle will become more complex.

In EU Universities will remain the prime actors in the knowledge triangle. Collaboration with industry will be even more pronounced, with perhaps more clearly defined roles for each player.

The Humboldt university model seems to be outdated, but research and higher education must remain connected.

There will be a stronger link between research and innovation. It will be more and more difficult to discriminate fundamental and applied research. On the other hand, the highest level of education is research and it is clear that in 2025 the best universities will be as ever those where the interaction between the vertices of the triangle is optimised.

The knowledge triangle should be developed by breaking boundaries between universities and industries, which means university professors to be employed both by universities and corresponding industries of his/her professional field. Industrial representatives should be currently involved (employed) in university training and education. This mutual process will facilitate the innovation process.

University involvement in innovation will continue to grow, and Universities will need to be more involved in exploitation, perhaps by means of subsidiary organisations that are more closely tied to industry (e.g. research centres or institutes). Education will have a significant training component, as researchers are more mobile with respect to the industry-academic transition. A major challenge will be to continue to support basic research as funding models and expectations become more applied. This is critical for the long-term success of any technology-driven enterprise.

The triangle of education, research and innovation is one of the most essential tasks of the universities and therefore universities should look for their best way to fulfill all the requirements.

Universities should promote innovation and research using as basis the education

If we mean that university is the top of higher educational institutions, then besides the education the research and innovation will play more and more important role.

Innovation and education will take place in universities, innovation in applied research centres and business.

Research will remain the important part of universities. Innovation is one of the tools to increase creativity of staff and students. Student-centred education should be developed.

There will be more pointed and profile shaped study programs, profession orientated education, more innovation because of a divers staff and an excellent pool of ideas.

4.5 Business as usual (BAU) scenarios

Out of the contributions some mini-scenarios suppose that no major changes will happen between now and 2025

5. Business as usual (BAU) scenarios

They will be more or less the same as today. Unless, there is an organised attempt to downgrade their importance in education.

It is not sure that there will be much difference. They may be more technologically advanced but the education part may not be so strong.

Not much different, despite the increased use of computer and network based technologies. The virtual experiments cannot replace the real and the function of teacher can not be replaced by any electronically based education method. Probably, the major effort in the knowledge triangle will be to find out the real, new and correct information from just garbage or intentionally misleading information.

The main characteristics will be the same as today, but the international system of higher education institutions will concern almost all countries in Europe, America, Australia and Asia. The networks will be much broader than now.

There will be no major improvement; they will progress in stagnation and self-contemplation, with some notable exceptions of course.

Universities will be recognisably the same fifteen years from now as they are at present. Changes will not necessarily be for the better, and the system is not broken.

The pressure to increase innovation in universities will result in focus on applied research and spin off that will change the current shape of universities probably also affecting governance but the essential of university in terms of advanced teaching and excellent basic research will continue, hopefully, as the core of European universities.

Europe will not be better in 2025 than now. Main reasons are the following: Each European country is different from the other one, we cannot compare Member States for the funds and the support to research and there is no European policy (the common treaties signed by the Ministers of Higher Education are not obligatory to comply with).

The situation will be similar as today, in the best universities probably will increase the role of research activities

4.6 Utopia

A set of suggested mini-scenarios see a successful role for universities in the future as a utopia. Mini-scenarios relate to low quality universities because of decreased public funding and increased global competition, imbalances between sciences because of extreme commercialisation, etc.

6. Utopia

Talking about European universities is a utopia because they do not exist, it depends on each national policy. In Spain I see a black future because the government does not require responsibilities of the universities.

It will be governed in an internally centralised and commercialised way with a strong leadership forced to adapt to the market. This development will be extremely destructive to science in all fields, but particularly to humanities and social science.

Because of the decreasing amount of money invested in European Universities, competitiveness from other areas of the planet and low payment of researchers and professors, the level of European Universities are seemingly to decrease in the near future. A strong impulse on a European Level aiming to reach a European response is necessary to prevent that.

The policy to decrease the funds dedicated to research that some countries (such as Italy) are carrying out will negatively influence the degree of innovation and the competitiveness of the universities in the national and international scenario. As a consequence, it is possible that in this case the transfer of knowledge from research to education will suffer going towards a low quality level of standardisation, probably driven by the economic needs instead of cultural and backgrounds consolidation (mandatory for further innovation).

In those countries that, despite the economical and financial crisis, will follow a program of maintaining the support of the research, the knowledge triangle will be conserved where education gets contribute from research and innovation, and research and innovation both collaborate to enhance their respective forces and further feed a higher and higher quality education.

5. From scenarios to actions

For each of the issues assessed in the survey, actions are suggested for universities to take in order to address the issue. The relevant policy document at EU level as regards policy priorities for the future of universities is the Commission Communication[6] "Delivering on the modernisation agenda for universities: education, research and innovation".
This communication proposes 9 policy priorities as part of the modernisation agenda for universities in Europe. See table 8 below for an overview of the priorities proposed.

Policy priorities proposed in the modernisation agenda for universities - COM(2006) 208
1. Break down the barriers around universities in Europe
2. Ensure real autonomy and accountability for universities
3. Provide incentives for structured partnerships with the business community
4. Provide the right mix of skills and competences for the labour market
5. Reduce the funding gap and make funding more effectively in education and research
6. Enhance interdisciplinarity and transdisciplinarity
7. Activate knowledge through interaction with society
8. Reward excellence at the highest level
9. Make the European higher education area and the European research area more visible and attractive in the world

Table 8: Policy priorities proposed in the modernisation agenda for universities -COM(2006) 208

As part of the survey, senior university managers were asked to propose actions that should be taken for each issue that they were asked to assess. Many of these issues have a connection with the modernisation agenda mentioned above.
In this section some examples are given of proposed actions for each of the policy priorities of the modernisation agenda. The examples of actions are presented using the likely mini-scenario "the global university". Similar examples could be developed for the other scenarios.

[6] COM(2006) 208 - http://ec.europa.eu/education/policies/2010/doc/comuniv2006_en.pdf

Examples of actions for the likely mini-scenario: "the global university"

		Policy priorities proposed in the modernisation agenda for universities -COM(2006) 208			
		1. Break down the barriers around universities in Europe	**2. Ensure real autonomy and accountability for universities**	**3. Provide incentives for structured partnerships with the business community**	**4. Provide the right mix of skills and competences for the labour market**
Main issues of the mini-scenario: "the global university"	**A.1/ By 2025, higher education institutions will have become globally competitive and thus able to cope with people of many different nationalities and cultural backgrounds.**	EU universities should promote a mutually beneficial offer, in which cultural, linguistic and academic differences are explained, analyzed and made accessible for a richer approach of teaching and research, instead of being erased in favour of an all-English monochromatic (and therefore poorer) system. Offer more programs in English; Expand their international partner network; Seek international accreditations; Focus on ranking positions; Develop websites; Recruit international faculty and staff.	We have many universities and despite Bologna still different systems. We are at very different stages of development. It's clearly important for us all to act to remain or become competitive but a single road path for all of us is unrealistic and would not be beneficial for all or the system. Greater diversity of mission and activity would be better. Have external people in Administration Councils.	Introduce as a rule that it is impossible to receive a post of full professor without minimum 2 years practice in practical application of knowledge in his/her special field, preferably abroad.	Actively work for finding workforce also from outside Europe, to keep Europe competitive in the future. And then to educate them well. For this, the schools need to be impressive for the applicants, because there are lots of impressive schools elsewhere. Best people will be the most skilful and knowledgeable, and guarantee competitive levels at work.
	A.2/ By 2025, emerging regions in Asia and elsewhere will have become the most important centres of research and innovation.	Only ensuring and fostering the existence of a single common space of high education and research of excellence will ensure competitiveness with other areas in the world.	It is not a matter for universities; it is a matter of national governments. Universities need more freedom and a better financial support.	Open new programs co-funded by universities and industry/foundations/banks, to support specialized centers partially opened to give service to industry and the community; Valorisation of research results should be an asset.	European universities should prepare for bigger relations and mobility with these countries with language courses, adaptation for difficulties by differences in languages...
	A.3/ By 2025, virtual higher education and research organisations are established, taking advantage of advanced computing, global networks of interdisciplinary teams and a mix of skills.	Established networks of European universities could develop such programs. Build on the good experience of inter institutional co-operation of the Framework and Bologna programmes and processes. Support shared research infrastructures.		IT is nowadays mission-critical for universities, hence competitive IT infrastructures and services are the key (also in the sense of IT-business alignment, where business means university core business research, teaching, and knowledge transfer into society).	It will be easy to have teaching and learning at a distance but it will be not so easy to make sure that the students achieves training in a manner that is research oriented and developed the research and flexibility skills employers are looking for via virtual facilitation. Virtual provision might aid but there is no evidence yet that it will replace the face-to-face experience as regards training in the critical skills for economies.
	B.2/ By 2025, today's less developed economies will continue to face brain drain, low science-innovation links and an ever-widening technological gap with the rest of the world.	Make sure brain drain does not affect Europe as a continent. There might be internal brain drain within Europe (like there is inside the USA) but Europe should make sure that globally, it is retaining and attracting talent.	It is not a problem of the developed economies universities.		
	C.1/ By 2025, societal needs and values will be the most important drivers of research and innovation.	Respective topics in joint programming.	Universities must - in order to maintain their funding base - be ready to address the grand challenges of society. Taxpayers will demand evidence that they get value for money. This may potentially threaten the funding of basic research. Develop models to support blue-skies thinking even as support for it from public funds diminishes.	Strong relationship with social groups, enterprises and institutions Universities should be able to resist the easy money. But, I think there may be a division of the university system to some relatively small ones with long-term funding and nobel-level basic research and some that get more marginal funding and concentrate on the acute needs of the local industries. (So, the action to take is to decide which group you want to belong).	Developed countries, but not obligatory the same as today, will introduce more and more new technologies what will create demand for new knowledge and skills of personnel. Because of this, Univer5sities should arrange teaching in these directions. As important actors, European universities should develop managerial skills and expertise not only in research and education, but also in answering societal needs.

Table 9: Examples of actions proposed by senior university managers, to be taken by universities in Europe in addressing issues as part of mini-scenario 1: "The global university".

5. Reduce the funding gap and make	6. Enhance interdisciplinarity and	7. Activate knowledge through interaction	8. Reward excellence at the	9. Make the European higher

funding more effectively in education and research	transdisciplinarity	with society	highest level	education area and the European research area more visible and attractive in the world
Resources for basic research should be guaranteed. To catch up, measures to be taken are increase of budget, of scientists-students-ratio, and autonomy. On-top-budget along with new structures, processes, and services is surely needed for diversity management.	Master co-diplomation in specific fields.	Universities need to develop closer connections with the general public and with the communities in which they are situated. In particular, universities need to examine how best they can assist in the continuing development of past graduates and others in the work force. Young and talent people should be engaged with research. This means that they should have trust in the future when they select academic track.	Create a network of excellence going beyond national borders. Surely not every European university will be able to play in the premier league - hence a smart scheme for differentiation is needed.	More focus on marketing their programmes in Asia today compared to US as an example. Provide scholarships to get the top 10% students from emerging country like India, China, Vietnam or Eastern Europe. The middle range universities should start immediately to have an international development strategy.
Foresee in all EU and national grants minimum 5% of budget for joint work with Asian scientists including exchange of scientists, especially young. The emerging regions "threat" is secondary for them. First, they have to find the formula to distinguish basic research, applied research, development and innovation and to find how to manage and finance them appropriately according to the very nature of these quite different human activities. Coordination in the establishment of goals is absolutely necessary.		As Europe has a long and important tradition in research of humanities and cultural studies, Europe has to put emphasis on these fields, also because those research subjects are very important for European identity.	Our international efforts should be driven by quality and not trends. A top university will have associations with those universities and research centres that promote similar research. Remuneration of inventors should play a major role in attracting the best researchers.	Focus on marketing distinctive differential elements (cultural diversity, language, public/private cooperation, welfare, design, creativity)
Invest in clever/good value for money equipment. The opening up of EU based networks and the sharing of institutional partnerships to create such networks. Emphasis on a range of effective networks rather than a single network per theme.	It is not easy to motivate people from different research areas to work together on a common subject. Moreover, there are no real "interdisciplinary" scientific journals. The difficulty is here to produce real science, and not only a mix of things of low level. It is essentially at the level of graduate studies that the interdisciplinarity will have a strong impact. To remain attractive universities need to promote very good - open minded - research labs with international impact.	In general EU Universities should invest more en pay more attention to visibility/contacts/ results sharing/collaboration through Internet	Offer economic and academic rewards to innovative, and interdisciplinary individual teachers and researchers and teams. In addition to disciplinary excellence also multi-, inter- and transdisciplinary excellence deserves much attention.	Europe should do efforts for coordinating such virtual centres and to participate in global networks.
		Need to focus on their niche strengths in areas which will have long term relevance to society. Need to ensure their staff have experienced research and teaching in leading institutions worldwide and therefore have their minds opened to what is necessary to continue to develop and innovate. This implies recruitment strategies that encourage early mobility for researchers who will then be competitive for academic positions. They will also have contacts which will keep their institutions linked to other institutions worldwide.	Any leading university welcomes the opportunity to collaborate with and recruit top scientists from all over the world, including third-world countries. The politicians must decide how much support they will give for this.	Establish alliances and shared programs and degrees with universities in less developed countries. Promote top-level education in less developed countries, opening of university offices, exchange of students and support services (grants and scholarships to students from less developed countries to ensure an excellent education). This is mainly a question of general political impact. European society should become aware that its leading role is (or was) the by-product of investing in scientific innovation (which in turn is linked to a stimulating intellectual environment in the wide sense…). Either a new Renaissance takes place or Europe (at least most countries in Europe) is doomed to decline more and more.
In fine, society pays for the universities, so it is obvious that societal needs and values will be the most important drivers of research and innovation! It becomes more and more difficult to imagine an independent "reflective" action of universities (and their actions as value-makers). Universities need to defend their freedom but no freedom exists if you are not close to the economic and political powers.	Realise the importance of interdisciplinary skills to meet with societal needs, not least the importance for humanities and social sciences	Fight it. Explain the difference between short term apparent needs and long-term unpredictable needs. Europe has to take care to not only finance economically successful research, but especially those socially necessary, e.g. climate change, problems of mobility, intercultural discourse. The previous century was a time for high technology. I am sure that the present century will have to take in account the social needs of the population. Universities must improve the contact between research and main points of interest of the population.	Remunerate professors who engage themselves in a high class way with society. This is now played down through the ISI and other assessment systems. Should not become too distracted by "societal needs" as defined by politicians, continue to focus on basic research of highest possible quality	Europe must be ready to maintain its leading position in the world in both education and research. Adaptation to the needs and changes of the society is necessary in order to offer a flexible response to them.

Table 9 continued: Examples of actions proposed by senior university managers, to be taken by universities in Europe in addressing issues as part of mini-scenario 1: "The global university".

6. Conclusions for the vision building process for the future of higher education in Romania

This report presents diverging views on the future of higher education in Europe, based on a survey among senior university managers and university researchers. This is done by giving an indication of the societal challenges that senior university managers consider to be relevant for their institutions, by describing 6 alternative mini-scenarios for the future of universities in Europe, and by translating three of those scenarios into possible policy options.

Using this as a starting point, a set of guiding questions can be asked that can facilitate the process of vision building for the future of higher education in Romania.

- Which scenarios (or elements of scenarios) are most interesting to have a look at for higher education in Romania?
- Which are likely implications of those scenarios for Romanian higher education?
- Which of these implications are desirable? Which are highly undesirable?
- What would be a desirable future for Romanian higher education?
- What policy priorities would need to be put in place to make this desirable future more likely?
- How robust are these policy priorities against each of the scenarios proposed?
- Do Romanian universities choose to address societal challenges as part of their mission? If so, which ones?

Annex 1: List of issues assessed in the survey

Issue Code	Issue description
	A. The Future State of Globalisation
A.1	By 2025, higher education institutions will have become globally competitive and thus able to cope with people of many different nationalities and cultural backgrounds.
A.2	By 2025, emerging regions in Asia and elsewhere will have become the most important centres of research and innovation.
A.3	By 2025, virtual higher education and research organisations are established, taking advantage of advanced computing, global networks of interdisciplinary teams and a mix of skills.
A.4	By 2025, competitive regions will have specialised in one or a small number of specific knowledge-oriented sectors.
A.5	By 2025, the assessment and certification of knowledge by peers in informal international networks (e.g. through social computing) will have become more important than the role of established institutions.
	B. The Future State of Mobility
B.1	1/ By 2025, several European countries will face a substantial decline in the number of researchers and PhD students.
B.2	2/ By 2025, today's less developed economies will continue to face brain drain, low science-innovation links and an ever-widening technological gap with the rest of the world.
B.3	3/ By 2025, a large part of the workforce will not have met the demand for a combination of new skills and competences with conventional knowledge of specific industries.
B.4	4/ By 2025, alternative education systems (online education, distance education, competition from foreign universities) will have replaced substantially the traditional higher education system in several European countries.
B.5	5/ By 2025, massification of highly standardised higher education will coexist with rather limited access to personalised education.
	C. The Future State of 'Third Mission of Universities'
C.1	1/ By 2025, societal needs and values will be the most important drivers of research and innovation.
C.2	2/ By 2025, top down governance in research will have been complemented substantially with participatory ways of decision-making using social networking tools.
C.3	3/ By 2025, different stakeholders such as politics, university, industry and representatives of civil society are highly involved in research and innovation through online networks.
C.4	4/ By 2025, the protection of intellectual property will have become to a great extent irrelevant, as successful innovation will have come to depend more and more on knowledge sharing and open innovation.
C.5	5/ By 2025, NGOs have considerably more power than today and play a crucial role in evaluating added value of new technologies for society and in debating on potential controversies and conflicts new technologies may bring.

Annex 2: Questionnaire for university managers

Survey on universities in Europe and beyond for Senior Management

This survey aims to collect your opinions on the present and future state of universities in Europe and beyond and their relation to the European Research Area. Responding to the full survey should take no more than 20 minutes, although it is possible to choose to answer only those questions related to either the current outlook or those looking towards 2025 by leaving some questions unanswered. In either such case, the completion of the survey would take only 10 minutes. Please, continue until the last page to submit your answers.

A. The Future State of Globalisation

You are invited to assess the issues below according to the following two criteria:

• Probability by 2025:
How probable is it that the issue described has become a reality by 2025?

• Relevance for European universities to act today:
What is the relevance of this issue for universities in Europe to act upon it today?

1/ By 2025, higher education institutions will have become globally competitive and thus able to cope with people of many different nationalities and cultural backgrounds.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

2/ By 2025, emerging regions in Asia and elsewhere will have become the most important centres of research and innovation.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

3/ By 2025, virtual higher education and research organisations are established, taking advantage of advanced computing, global networks of interdisciplinary teams and a mix of skills.

- Probability by 2025
- Relevance for European universities to act today

- Please explain which actions in your opinion European universities should take?

4/ By 2025, competitive regions will have specialised in one or a small number of specific knowledge-oriented sectors.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

5/ By 2025, the assessment and certification of knowledge by peers in informal international networks (e.g. through social computing) will have become more important than the role of established institutions.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

B. The Future State of Mobility

You are invited to assess the issues below according to the following two criteria:

• Probability by 2025:

How probable is it that the issue described has become a reality by 2025?

• Relevance for European universities to act today:

What is the relevance of this issue for universities in Europe to act upon it today?

1/ By 2025, several European countries will face a substantial decline in the number of researchers and PhD students.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

2/ By 2025, today's less developed economies will continue to face brain drain, low science-innovation links and an ever-widening technological gap with the rest of the world.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

3/ By 2025, a large part of the workforce will not have met the demand for a combination of new skills and competences with conventional knowledge of specific industries.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

4/ By 2025, alternative education systems (online education, distance education, competition from foreign universities) will have replaced substantially the traditional higher education system in several European countries.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

C. The Future State of 'Third Mission of Universities'

You are invited to assess the issues below according to the following two criteria:

• Probability by 2025:

How probable is it that the issue described has become a reality by 2025?

• Relevance for European universities to act today:

What is the relevance of this issue for universities in Europe to act upon it today?

1/ By 2025, societal needs and values will be the most important drivers of research and innovation.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

2/ By 2025, top down governance in research will have been complemented substantially with participatory ways of decision-making using social networking tools.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

3/ By 2025, different stakeholders such as politics, university, industry and representatives of civil society are highly involved in research and innovation through online networks.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

4/ By 2025, the protection of intellectual property will have become to a great extent irrelevant, as successful innovation will have come to depend more and more on knowledge sharing and open innovation.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

5/ By 2025, NGOs have considerably more power than today and play a crucial role in evaluating added value of new technologies for society and in debating on potential controversies and conflicts new technologies may bring.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

6/ How will universities look like in 2025?

Describe briefly how you think research, innovation and education (i.e. the knowledge triangle) will look like in European universities in the year 2025.

D. The Present State of Mobility

Please evaluate the statements below on the scale indicated.

1/ Below you find a few statements about the effects of researchers' mobility across European countries in your University. Please indicate your estimation on a scale Less-More in comparison to non-mobile colleagues.

"I believe that researchers in my university who have worked abroad (will) have less/more …"

a) … opportunities for finding a job abroad
b) … opportunities to be promoted
c) … capacity to choose research topics
d) … chances to obtain a permanent position
e) … opportunities for specialisation
f) … opportunities for finding a job in another sector
g) … collaboration in research projects with foreign universities/research centres

2/ Please evaluate the value of the following types of mobility according to their recognition in the career development of researchers/teachers at your university. Please indicate your estimation on a scale Negative-Positive.

a) Postdoctoral positions in another country
b) Postdoctoral positions in another sector (e.g. industry)
c) Previous job positions in another national university/research centre
d) Previous job position in another sector
e) Short visits in another national university/research centre
f) Short visits in another international university/research centre
g) Short visits in another sector

What are your reasons for the highest and the lowest score?

3/ Please indicate whether researcher mobility has a negative or positive effect in your university. Please indicate your estimation on a scale Negative-Positive.

a) The overall effects of attracting more researchers to my university are…
The main reasons for that are…

b) The overall effects of researchers of my university spending a short time abroad are…
The main reasons for that are…

c) The overall effects of researchers of my university working a long time abroad are…
The main reasons for that are…

4/ What are the main challenges in your university regarding attracting foreign researchers to your university?

5/ What are the main challenges for increasing the number of researchers from your university in/to foreign universities?

E. The Present State of 'Third Mission of Universities'

Please answer the questions below related to the third mission in your university.

1/ Does the Unit you are managing (Rectorate, Vice-rectorates, Faculties/Schools, Departments) collaborate with industry?

Please, tick the appropriate response: Yes/No

2/ Does your University have a Technology Transfer Office (TTO)?

Please, tick the appropriate response: Yes/No

3/ Please evaluate the following statements on the role of patenting in universities on disagree-agree scale.

a) Patenting is essential for a successful university in research activity
b) Patenting is part of the aims of a researcher's activities
c) University ownership of patents is the best strategy to profit from university/industry collaboration
d) Being an inventor of patents is the best strategy to profit from university/industry collaboration
e) The pressure for patenting is harmful to research activities.

Please explain your reasons:

4/ Please evaluate whether you consider the following aspects benefit from establishing spinoffs?

a) Increasing visibility of University
b) Availability of stage and apprenticeship for students
c) Establishment of a relationship between a university/research centre and the corporate environment
d) The conversion of research into cutting edge innovation

Which other benefits do you think spinoffs can have?

Please explain your reasons:

5/ Please evaluate the following statements on the role of collaborating with the Technology Transfer Offices (TTOs) of universities on a disagree-agree scale.

a. To liaise with TTOs is an important part of research activities.
b. TTOs are important actors in establishing contacts with industry.
c. TTOs are important in developing research projects.
d. TTOs are important in managing the Intellectual Property Right (IPR).
e. I do not value much the function of the TTO.

Please explain your reasons:

6/ Please evaluate the following statements about the role of public engagement with society in universities on a disagree-agree scale.

a. Public engagement is not useful because science and research works with different deliberation dynamics.
b. Public engagement is a distraction from doing research. It's not the role of researchers to seek consensus.
c. Public engagement is only a marketing exercise to 'sell' better our science.
d. Public engagement is useful to dialogue with society and to understand its needs.
e. Public engagement with society should be inclusive of citizens' instances and therefore more democratic.

Please explain your reasons:

7/ Which of the societal challenges should have the highest priority for universities in your country/region?

Please formulate the challenge as concretely as possible.

F. The Present State of Financial Management

Please answer the following questions on financial management in your university.

1/ How would you define the Unit for which you have managing responsibilities?

Please tick the appropriate box:

- Rectorate
- Vice-Rectorate
- Faculty
- School
- Department
- Other:

2/ Do you have any responsibility regarding the financial management of the Unit you are managing?

These responsabilities can relate to planning, monitoring, organising, and controlling of the monetary resources.

Please tick the appropriate box: Yes/No

3/ Which is the degree of autonomy you have as a manager to … ?

Please indicate your preference on the scale below.

a. ... reallocate resources within your unit
b. ... set tuition fees
c. ... borrow money on the financial market
d. ... raise funds from private investors or donations
e. ... recruit staff
f. ... negotiate salaries

4/ What are the plans of your Unit regarding implemented an accounting system that identifies the full cost of your activities?

An accounting system that identifies the full cost of your activities takes into account all the direct and indirect costs that need to be considered to run the Unit.

Please tick the appropriate box:

- My Unit has already implemented such a system
- My Unit is in the process of implementing such a system
- My Unit is planning to implement such a system in the near future
- My Unit does not plan to implement such a system in the near future
- My Unit cannot decide on this issue

5/ What areas does this accounting system cover?

Select all the possible options:

- Research activities

- Teaching activities
- Projects
- Other activities (library, publishing company, bookshops, etc.)

6/ In your opinion, what are the main advantages of having implemented an accounting system that identifies the full costs of your activities?

Please indicate your preference on the scale below.

a. Improvement of universities' accountability and have more efficient resource allocation.
b. Improvement of internal financial management and better strategic decisions (e.g for investments).
c. Possibility to better comply with the Framework Programme requirements.
d. Improvement of comparability among different universities across Europe.
e. Better possibilities to negotiate with external parties (e.g. public-private partnerships) and funding agencies.
f. Improvement of culture of transparency.
g. Other advantages:

7/ In your opinion, what are the main difficulties of implementing an accounting system that identifies the full costs of your activities?

Please indicate your preference on the scale below.

a. Lack of support from University's main governing bodies.
b. Lack of support from national/regional government.
c. Lack of managerial skills required to implement such as system.
d. Lack of autonomy to change the accounting system of the institution.
e. Availability of data needed. This means that no complete information about the full cost of all activities can be developed.
f. Lack of culture of transparency.
g. Other difficulties:

8/ In case you are a (Vice) Rector, does the Rectorate have to submit financial reports to the funding authorities (Ministries, Regional Governments, etc)?

If you are not a (Vice) Rector please ignore this question.

Please tick the appropriate box(es):

- No reports
- Financial reports
- Scientific/Performance reports
- Management reports
- Intellectual capital statements
- Other:

9/ In case you are not a (Vice) Rector, which reports on financial issues is your Unit compelled to submit to the University's main governing body (Rector/President)?

In case you are a (Vice) Rector, please ignore this question.

Please tick the appropriate box(es):

- No reports
- Financial reports
- Scientific/Performance reports
- Management reports

- Intellectual capital statements
- Other:

G. Identification Questions

Finally, please answer some questions regarding your profile before submitting your answers.

1/ Do you have any formal qualification as manager?

Please tick the appropriate box: Yes/No

2/ If Yes, please specify qualification and year of award

Please specify your manager qualification:

Please specify year(s) when the qualification was awarded:

3/ How were you selected to be the manager of this Unit?

Please choose one from the list below.

- Democratically elected by the academic community (academic staff, other staff, students)
- Nominated by the Rector/President of the University or the main governing body (e.g. Senate)
- Nominated by Ministry or other of the funding entity
- Selected from the external labour market though a competitive process
- Other:

4/ What is your country of nationality?

Please choose one from the list below::

If Other, please specify your country here:

5/ Which description fits best your profile?

Please choose one from the list below.

- Rector
- Vice-Rector
- President
- Director
- Bursar
- Chancellor
- Dean
- Secretary-General
- General Manager
- Other:

6/ What is your main research domain?

Please select the one that best fits your academic activities.

- Natural Sciences
- Engineering and Technology
- Medical Sciences
- Agricultural Sciences
- Social Sciences
- Humanities
- Economics
- Other:

7/ What is the name of your current employing institution/organisation?

8/ In which country is it located?

Please choose one from the list below:

If Other, please specify the country here:

9/ What is your gender?

Please tick the appropriate box: Female/Male

Thank you for participating in this survey. If you would like to be informed of the results of this survey, and have an interest in other surveys on higher education, please fill-in your e-mail address.

SUBMIT

Annex 3: Questionnaire for university researchers

Survey on universities in Europe and beyond for Research and Teaching Staff

This survey aims to collect your opinions on the present and future state of universities in Europe and beyond and their relation to the European Research Area. Responding to the full survey should take no more than 20 minutes, although it is possible to choose to answer only those questions related to either the current outlook or those looking towards 2025 by leaving some questions unanswered. In either such case, the completion of the survey would take only 10 minutes. Please, continue until the last page to submit your answers.

A. The Future State of Globalisation

You are invited to assess the issues below according to the following two criteria:

• Probability by 2025:
How probable is it that the issue described has become a reality by 2025?

• Relevance for European universities to act today:
What is the relevance of this issue for universities in Europe to act upon it today?

1/ By 2025, higher education institutions will have become globally competitive and thus able to cope with people of many different nationalities and cultural backgrounds.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

2/ By 2025, emerging regions in Asia and elsewhere will have become the most important centres of research and innovation.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

3/ By 2025, virtual higher education and research organisations are established, taking advantage of advanced computing, global networks of interdisciplinary teams and a mix of skills.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

4/ By 2025, competitive regions will have specialised in one or a small number of specific knowledge-oriented sectors.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

5/ By 2025, the assessment and certification of knowledge by peers in informal international networks (e.g. through social computing) will have become more important than the role of established institutions.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

B. The Future State of Mobility

You are invited to assess the issues below according to the following two criteria:

• Probability by 2025:

How probable is it that the issue described has become a reality by 2025?

• Relevance for European universities to act today:

What is the relevance of this issue for universities in Europe to act upon it today?

1/ By 2025, several European countries will face a substantial decline in the number of researchers and PhD students.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

2/ By 2025, today's less developed economies will continue to face brain drain, low science-innovation links and an ever-widening technological gap with the rest of the world.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

3/ By 2025, a large part of the workforce will not have met the demand for a combination of new skills and competences with conventional knowledge of specific industries.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

4/ By 2025, alternative education systems (online education, distance education, competition from foreign universities) will have replaced substantially the traditional higher education system in several European countries.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

5/ By 2025, massification of highly standardised higher education will coexist with rather limited access to personalised education.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

C. The Future State of 'Third Mission of Universities'

You are invited to assess the issues below according to the following two criteria:

• Probability by 2025:

How probable is it that the issue described has become a reality by 2025?

• Relevance for European universities to act today:

What is the relevance of this issue for universities in Europe to act upon it today?

1/ By 2025, societal needs and values will be the most important drivers of research and innovation.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

2/ By 2025, top down governance in research will have been complemented substantially with participatory ways of decision-making using social networking tools.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

3/ By 2025, different stakeholders such as politics, university, industry and representatives of civil society are highly involved in research and innovation through online networks.

- Probability by 2025
- Relevance for European universities to act today

- Please explain which actions in your opinion European universities should take?

4/ By 2025, the protection of intellectual property will have become to a great extent irrelevant, as successful innovation will have come to depend more and more on knowledge sharing and open innovation.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

5/ By 2025, NGOs have considerably more power than today and play a crucial role in evaluating added value of new technologies for society and in debating on potential controversies and conflicts new technologies may bring.

- Probability by 2025
- Relevance for European universities to act today
- Please explain which actions in your opinion European universities should take?

6/ How will universities look like in 2025?

Describe briefly how you think research, innovation and education (i.e. the knowledge triangle) will look like in European universities in the year 2025.

D. The Present State of Mobility

Please evaluate the statements below on the scale indicated.

1/ Please evaluate the following statements about the effects of researchers' mobility on the indicated scale.

"I believe that researchers' mobility decreases/increases …"

a) … opportunities for finding a job abroad
b) … opportunities to be promoted
c) … capacity to choose research topics
d) … chances to obtain a permanent position
e) … opportunities for specialisation
f) … opportunities for finding a job in another sector
g) … collaboration in research projects with foreign universities/research centres

2/ Please evaluate the value of the following types of mobility according to their recognition in the career development of research and teaching staff at your university.

a) Postdoctoral positions in another country
b) Postdoctoral positions in another sector (e.g. industry)
c) Previous job positions in another national university/research centre
d) Previous job position in another sector
e) Short visits in another national university/research centre
f) Short visits in another international university/research centre
g) Short visits in another sector

Please explain your reasons for the highest and the lowest score?

3/ Regardless of your personal experience, do you think mobility is of benefit to researchers?

Please check the most appropriate box:

- Yes, of great benefit
- Yes, of some benefit
- Not very much
- Not at all

4/ If Yes, please evaluate in each stage of a researcher's career whether mobility has a negative or positive impact (in terms of collaborations, publications, career development, etc).

If not, please go to next question.

- Mobility in the early career stage (during Masters and/or PhD or 0-5 yrs experience)
- Mobility in the middle stage of a career (5-9 yrs experience)
- Mobility in the later stage of a career (10+ yrs experience)

The main reasons are…

5/ For what reasons would you consider / not consider working abroad?

- The main reasons why I would consider working in another country are…
- The main reasons why I would not consider working in another country are…

6/ For what reasons would you consider / not consider working in another sector?

- The main reasons why I would consider working in another sector are…
- The main reasons why I would not consider working in another sector are…

E. The Present State of 'Third Mission of Universities'

Please answer the questions below on the indicated scale.

1/ Do you collaborate with industry?

Please tick the appropriate response: Yes/No

2/ Does your University have a Technology Transfer Office (TTO)?

Please tick the appropriate response: Yes/No

3/ Please evaluate the following statements on the role of patenting in Universities on the indicated scale.

a) Patenting is essential for a successful research activity university
b) Patenting is part of the aims of a researcher's activities
c) University ownership of patents is the best strategy to profit from university/industry collaboration
d) Being an inventor of patents is the best strategy to profit from university/industry collaboration
e) The pressure for patenting is harmful to research activities.

4/ Please evaluate whether you consider the following aspects benefit from establishing spinoffs?

a) Increasing visibility of the university
b) Availability of stage and apprenticeship for students
c) Establishment of a relationship between a university/research centre and the corporate environment
d) The conversion of research into cutting edge innovation
Which other benefits do you think spinoffs can have?
The main reasons are…

5/ Please evaluate the following statements on the role of collaborating with the Technology Transfer Offices (TTOs) of universities on a disagree-agree scale.

a. To liaise with TTO is an important part of research activities
b. TTOs are important actors in establishing contacts with industry
c. TTOs are important in developing research projects
d. TTOs are important in managing the Intellectual Property Right (IPR)
e. I do not value much the function of the TTO
The main reasons are…

6/ Please evaluate the following statements about the role of public engagement with society in universities on a disagree-agree scale.

a. Public engagement is not useful because science and research works with different deliberation dynamics.
b. Public engagement is a distraction from doing research. It's not the role of researchers to seek consensus.
c. Public engagement is only a marketing exercise to 'sell' better our science.
d. Public engagement is useful to dialogue with society and to understand its needs.
e. Public engagement with society should be inclusive of citizens instances and therefore more democratic.
The main reasons are…

7/ Which of the societal challenges should have the highest priority for your university?

Please formulate the challenge as concrete as possible?

F. Identification Questions I

Finally, please answer some questions regarding your profile.

1/ What is your gender?

Please tick the appropriate box: Yes/No

2/ What is your country of nationality?

Please choose one from the list below:

If Other, please specify your country here:

3/ Which description(s) fit best your profile?

You can select more than one answer from the list below:

- Researcher in a university
- Teacher in a university
- Researcher in a public research centre
- Researcher in a private research centre
- Other:

4/ What is your main research domain?

Please select the one that best fits your academic activities:

- Natural Sciences
- Engineering and Technology
- Medical Sciences
- Agricultural Sciences
- Social Sciences
- Humanities
- Economics
- Other:

5/ What is your job title?

6/ What is the name of your current employing institution/organisation?

7/ In which country is it located?

Please choose one from the list below:

If Other, please specify the country here:

G. Identification Questions II

Finally, please answer additional questions regarding your profile before submitting your answers.

1/ What is your highest formal qualification?

Please tick the appropriate box: Yes/No

Please specify the year when the qualification was awarded:

2/ Did you obtain any of these formal qualifications in a different country to the one you are currently working in?

Please tick the appropriate box: Yes/No

If Yes, please specify the countries here:

Please choose one from the list below for the Undergraduate Degree:

If Other, please specify the country here for the Undergraduate Degree:

Please choose one from the list below for the Masters Degree:

If Other, please specify the country here for the Masters Degree:

Please choose one from the list below for the Doctorate:

If Other, please specify the country here for the Doctorate:

3/ How many POSTDOCTORAL positions have you held?

Postdoctoral positions are defined as non-tenure track positions (beyond the level of a required doctoral degree).

Please specify here the number of POSTDOCTORAL positions:

If 1 or more, did/does it occur in a different country to the one you obtained your PhD degree? Yes/No

Please choose one country from the list below for the longest POSTDOCTORAL position:

If Other, please specify the country here for the longest POSTDOCTORAL position:

4/ Have you held any academic job position ABROAD before your current post, excluding postdoctoral positions?

Abroad stands for a country different from your country of nationality.

Please tick the appropriate box: Yes/No

Please choose one country from the list below for the longest academic job position ABROAD:

If Other, please specify the country here:

5/ Have you worked before your current post in another non-academic SECTOR (e.g. industry, government)?

Please tick the appropriate box(es):

- Yes – Industry
- Yes – Government
- No

6/ How often do you enjoy SHORT VISITING STAYS (less than one year)?

Please tick the appropriate box:

- More than one per year
- One per year
- One every two years
- Less often
- Never

What is the average duration of your short visits?

- Less than 1 month
- Between 1 and 3 months
- More than 3 and max. 6 months
- More than 6 months

7/ All questions in this section refer to your publication activities.

- Please specify here the number of ISI publications you have published from 2001 onwards:
- How many of them are a joint publication with colleagues that you have met during any period of mobility?
- Did you publish any ISI scientific article before finishing your PhD? Yes/No
- How many other type of publications (non-ISI articles, book chapters, etc.) have you published from 2001 onwards?
- Were/are you obliged to be mobile (short stays) in your contract/fellowship? Yes/No

Thank you for participating in this survey. If you would like to be informed of the results of this survey, and have an interest in other surveys on higher education, please fill-in your e-mail address.

SUBMIT