

## Opening keynote

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# Universities in the 21st century

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### 1. Introductory remarks

Ladies and Gentlemen, it is a special honour to be invited to this conference and to deliver a keynote speech. It gives an opportunity to launch a dialogue with important stakeholders of the universities. Today's conference room is an appropriate setting for having such a dialogue, since, in this room, many debates on issues relevant to universities have taken place. I remember well that in February 2007 it was here that the launch conference for the European Research Council was held. On that occasion, the Federal Chancellor of Germany, Mrs Merkel, gave the key note address. I also remember that, in March 2007, EUA was engaged here in tough negotiations about the Communiqué of the next meeting of the Bologna ministers, scheduled in London in May 2007. And, about seven or eight months ago, I had a debate here, organized by *Die Zeit*, with German professors on the nature and the consequences of the Bologna process. In this room, the future of universities has been discussed again and again.

Let me also make another introductory remark. After eight years of working with the European University Association (EUA), 2001–2005 as vice-president and since 2005 as president (my term will end in March 2009), time has come to reflect on the experiences I have gained when participating in so many conferences and in so many reform discussions on universities, reaching from Turkey to Portugal, from Ireland to Finland. After all these events you ask yourself, for what vision, for what idea you were working for. What should be the profile of universities in the twenty-first century? What should a university achieve in the future and for what should it stand?

### 2. The present landscape of universities in Europe

I may start my considerations on universities in the 21st century with some reflections by Ralf Dahrendorf, a prominent scholar working at German and US universities and one with a highly distinguished political and academic career. He served as State Secretary in the German federal government, worked as Commissioner of the European Union and headed the London School of Economics as its director.

In 2000, he wrote a book with the title *Universities after Communism*. In this book, in a chapter on “Universities: Idea and Reality”, he reflects on the path a university should pursue, especially after the breakdown of communism in the eastern part of Europe. I may quote him: There is “little sense to search for an idea of the university” (p. 103), universities are “a ragbag of institutions with no clearly defined boundaries and no substantive core” (p. 105). He then continues: There are many institutions turning information into knowledge and combining the creation and dissemination of knowledge with higher education. In these respects, there is nothing special about universities. For him, the university should be an autonomous institution, with funding from a variety of sources, in which “hundred flowers continue to bloom” (p. 105). The university should explore “new methods of teaching, new theories and new applications” (p. 107), and be characterized by flexible structures, openness for new activities and geographical and societal “outreach”.

Yet: What is the reality of European universities today? In order to understand the present landscape of European universities, allow me to comment shortly on the history of the university. In 1088, the first European university, the University of Bologna started to operate. Even today, some of the medieval features of a university are still alive, especially in England. There, e.g., you still can witness that the university, originally, was a “universitas magistrorum et scholarium”, a community of teachers and students, enjoying a high degree of autonomy from the state as well as from the church and having an own legal identity. This community was characterized by a “commensium”, by the rule to eat together. In US universities you still find the “commons”, in English universities the “high table”. This habit of eating together stressed that the activities of teaching and learning were supported by a (monk-like) community of professors and students. Today, the medieval university is also visible in its division into faculties. Originally, there was, on the one hand, the “inferior” liberal arts college and, on the other hand, the “superior” professional schools (faculties) of theology, law and medicine. This differentiation is still existing in the US.

The traditional university system was fundamentally challenged by the French Revolution. In 1791, the “Assemblée nationale” issued a report by a commission, headed by Talleyrand, then bishop of Autun and a member of parliament, on how the educational system of the revolutionary France should look like. Besides strengthening primary and secondary education, this report contains a chapter on universities. There you find the shocking statement that, on behalf of progress, France should abolish its universities. Universities (like monasteries) were regarded as serving no purpose, but consuming resources. They constituted an idle class. As a consequence, many universities were closed. This idea of closing universities even spread to Germany. Universities there, like the ones in Erfurt or Cologne were closed too. Instead of universities, *écoles spéciales* (today the *grandes écoles*) were founded. The famous *Ecole Polytechnique* was established in 1794 and, still today, is not managed by the ministry of science or education, but by the ministry of defense.

State utilitarianism shaped French educational policies. At least at the time of the revolution, but also afterwards, France wanted a well-trained state cadre in order to strengthen the nation state, especially vis-à-vis the old regimes in the other parts of Europe. The revolutionary ideas needed to be defended by state technocrats. After France, the idea of establishing “polytechnics” spread over Europe, in particular to Germany where *Technische Hochschulen* like the “*Technische Hochschule Karlsruhe*”, were established. Later on, these polytechnics often turned into (technical) universities. The next speaker of this conference comes from such a technical university.

Around 1800 the German idealism fought against this state utilitarianism, and advanced the idea of the Humboldtian university. The very purpose of a university should be the search for new knowledge, the search for truth. A book by Kant called *Der Fakultätenstreit* was (and is) highly influential in developing

this speculative idea of a university. Kant recommended to transform the “inferior” liberal arts college to a “superior” faculty. Philosophy, taught in the liberal arts college, should be the dominant discipline within the university, because it deals with the question of truth. The activities of the faculties of theology, law or medicine should change from giving prescriptions into inquiring the true nature of their subjects. The university, according to Humboldt, was regarded as the meta-subject of knowledge. The university turned into a “*universitas litterarum*” and was no longer a “*universitas magistrorum et scholarium*”. The idea of a true research university was born. Note that the idea of a research university is not a medieval concept.

Given the huge successes of the sciences in the nineteenth century, given how German entrepreneurs used scientific insights for founding flourishing firms, especially in the chemical or engineering sector (pharmaceutical industry, electrical engineering, car industry), history seemed to prove the real power of the idea of the Humboldtian university. This idea of a research university even spread to other continents: The university systems in China or in Japan were transformed in order to incorporate the Humboldtian idea. The Humboldtian idea also reached the United States. At the end of the nineteenth century, the Johns Hopkins university introduced PhD studies on top of its bachelors’ and masters’ programmes. As a consequence, the US system changed into “a hybrid system”. Now, on top of the still medievally oriented university system, with many thousands of colleges and professional schools, you find 200–300 research intensive universities offering attractive PhD programmes also. Nevertheless, even today you still encounter prominent universities in the United States, like Amherst College, which decline to have PhD programmes.

After the success of PhD programmes in the United States, England turned to PhD programmes only recently. Before World War II, British universities had (nearly) no doctoral programmes. Famous scholars like John M. Keynes never received a doctoral degree, although his contributions contain new scientific insights and are still read again and again today, not least to find ways out of the financial crisis.

To sum up, when looking at the landscape of European universities, you still encounter medieval features. In France, you find the system of *grandes écoles*, besides a weakened, but now more and more strengthened university system. You still have the Humboldtian system in place in some countries. Finally, you find the hybrid system of the US, copied in some European countries. Today, due to the Bologna Process, university reforms change this university landscape and, at least, harmonize the study architectures. The outcome of these changes will be seen in the 21st century. Of course, these changes are accompanied by intensive debates and demonstrations here and there.

### **3. Critical points about the Humboldtian university**

Personally, I have become more and more critical about the Humboldtian university. It is not that I criticize the research intensity of a university which came about with Kant and Humboldt. Just to the contrary! I am convinced that adding a strong research component to a university actually makes a university fitter for the future. So it is not the research orientation of a university which should change but there are other aspects of the Humboldtian university which, in my view, need to be reformed.

Let me start my critique with the fact that the Humboldtian university, for quite a time, up to the middle of the 20th century, only offered PhD-programmes. At the same time, when universities were transformed into Humboldtian ones, the bachelor and master programmes were abolished. The Humboldtian university concentrated on PhD-programmes only. In contrast to this orientation, in polytechnics, based on the French technocratic tradition, diploma studies (*Dipl. Ing.*) were still at the core of

teaching programmes. Yet, universities were proud of having no such studies. Klaus Landfried, the former president of the German Hochschulrektorenkonferenz, stressed the point that it was actually the Nazi-regime which broke with the Humboldtian tradition, which introduced many diploma studies and forced the universities to adopt intermediate study programmes. The “Diplomkaufmann”, as he pointed out, was, for example, an outcome of such reforms of the Nazi-regime.

Why do we need to be careful now with the Humboldtian idea of having PhD studies only? The main reason is that today a massification of higher education has set in. Today, about 50% of a young age cohort studies at universities. Take, for example, Germany with its three million students – could you imagine all the three million students only pursuing PhD studies? So clearly, with the massification of the university system, a consequence of emerging knowledge societies, respectively knowledge economies, it does make sense to offer bachelor or master programmes at universities. The “PhD only” orientation is an extremely elitist concept today.

The main reason, why Europe needs a three-tier study architecture today, is derived from the fact that, due to the massification of higher education, Europe should have a differentiated study architecture at higher education institutions. The decision of policy makers and universities to use again bachelor and master programmes takes up traditional ideas which existed before the French Revolution in Europe. In that sense the Bologna Process does not aim at an Americanization of higher education, but, instead, means to return to the roots of European universities. Of course, one of the reasons, why we go back to old traditions has to do with the fact that, in this respect, the Anglo-American system preserved the medieval roots of the university and now seems to be better positioned when dealing with the phenomena of a massified higher education.

When I participated in the discussion with German professors, organized by the *Die Zeit* in this room some months ago, I indicated that, of course, universities should offer attractive PhD programmes, but that these programmes should only constitute a part of their activities, actually only a niche. They should be aware that society cannot afford that all students are in this PhD niche.

Another point, why I am critical about the reality of a Humboldtian university is that it created professorial feudalism, impairing the research independence of the young. Professorial feudalism is one of the main causes why European young researchers prefer to go to the United States. There they find the chance of conducting independent research. There they find plenty of opportunities of promotion. Not surprisingly, in Germany the average age of a “Habilitation” has now risen to around 40 years. Until then, the young researchers remain too dependent. As a young you have your own ideas and you want to organize your own experiments. And the young may have a higher innovative power which positively affects research and teaching in universities. In many universities in Continental Europe the number of (full) professors did not adequately increase with the massification of the university system of the last decades. Instead, more and more dependent staff members were employed around feudal professors.

A further problem of the Humboldtian university is that the academic staff itself wants to manage the university. Of course, if an academic is also an able manager then the academic is welcome to participate in leading a university. But the important point is: Not only academics should lead a university. You also need non-academic people in order to make the university effective and efficient.

Finally, one reason why the Humboldtian concept can be criticized is that it only provides one idea of a university. In fact, knowledge societies need a “ragbag of institutions” (Dahrendorf): a diversity of concepts for universities, a diversity of study programmes at different levels. Society demands a variety of profiles and missions: comprehensive universities with a global outreach, but also universities which act as engines of regional innovation, universities that focus in special areas or universities in which teaching plays the central role.

#### 4. The modernization agenda of the EU Commission

How should the profile of the European university system be characterized in the 21st century? To get a possible answer, look at the discussions which take place around and within the European Commission. Since 2003, the Commission has presented a series of documents on what the university sector should look like in the next years to come. Basically, this is an outcome of the debate on the Lisbon Agenda. As an expert, I participated in working out one of these documents: “Delivering on the modernization agenda for universities: education, research and innovation”, issued in May 2006.

There you find six points of relevance for shaping the universities in the 21st century. The first point is “Broaden access on a more equitable basis”. It has become a well-established trend in OECD countries that more than 50% of an age cohort will study at higher education institutions. There are some countries like Finland which today reach already 60–70%. The United States is approaching the level of 50%.

Some experts criticize that this trend may go to the expense of vocational education, in which many continental European countries have established a strong tradition. However, when the rate of economic and technological changes accelerates, when innovation is becoming more and more important, then you need people who are not so much trained at specific jobs, but who are able to learn and are sufficiently flexible. You need more generic skills, you need more “Bildung”. Vocational education might be advisable when providing the young generation with skills for the next five or ten years. Yet, general education might be better to provide job opportunities for the whole work life. In addition, there should be more scope for life long learning and that usually starts with general education. It is one of the most worrying phenomena in Europe that it is ageing at the highest speed in the world, but, at the time, life long learning has not gained the importance it deserves. Especially for the age cohorts between 30 and 60 years, life long learning is crucial, because working conditions change so much. Hence, Europe needs to broaden access to higher education on a more equitable basis for the young and the old generations. Europe should also go for less social reproduction in higher education. In the United States you find more upward mobility driven by general university education than in Europe: President Obama’s and his wife’s careers just prove this point.

The second important point on the modernization agenda is “Reach out to more research excellence”. This demand does not refer to the overall scientific production in Europe which is satisfactory, but to those publications which have the highest impact in the sciences. Take the ISI list of the most highly cited researchers. In a field like mathematics, where costly infrastructure is not needed to produce new knowledge and where the mother tongue should not play a crucial role, out of the 200 or 300 most highly cited researchers two thirds are associated with US-institutions. That should be alarming for Europe. Only 2–3%, for example, come from Germany. You could ask yourself what is left over in Germany from the tradition of Hilbert and others? France with 6–7% is still doing quite well in mathematics. Institutions in France have better preserved their strong traditions.

Point number three: Break down the barriers surrounding European universities. It is obvious that Europe has fragmented systems, and this in two respects: (a) the Inter-European mobility of academic staff is very low. A study by the European Commission indicates that only 3% of those employed at universities have had a position outside the country in which they obtained their PhD. To put it otherwise: 97% of the academic staff remain with all their employments in their PhD country. (b) The other aspect of fragmentation is low “inter-sectoral mobility”. Moving from academia to business or the other way round hardly happens in Europe.

The fourth point refers to the employability of graduates. University education should provide the appropriate skills and competences for the labour market. This is a relevant topic for Europe. The relevance

has to do with the fact that in the EU 25 (in 2006 when the document was written, Romania and Bulgaria were not yet members of the EU) 8.5% of all university graduates, aged between 25 and 29 years, were unemployed in 2005. In the United States that figure in 2005 was down to 2.6%, more than three times so low. Interestingly, this overall unemployment of graduates in the EU is concentrated in only some countries like France, Spain, Italy or Greece. In the Northern European countries the situation is like in the US.

With respect to employability universities need to ask themselves: Is the unemployment rate of their graduates too high and why? Society cares about providing the students with the appropriate skills and competences for the future labour market.

Finally, let me mention the last two relevant points of the modernization agenda for universities. One is “Create genuine autonomy and accountability of universities”. This has to do with the fact that in many European countries universities do not possess an own legal status. There, universities are still a dependent annex of the state, directed by ministries. Universities operate in the shadows of governmental bureaucracies. But, as autonomous and accountable firms are the agents of change in the economy, we need universities as autonomous and accountable agents for change in the knowledge society. So universities should move out of the shadows of their ministries and become independent entities, capable of pursuing own strategies in education, research and innovation.

The last point on the modernization agenda concerns university budgets. For many historical and political reasons, continental Europe, but also England, only spends 1.2–1.3% of GDP on universities. The only exceptions in Europe are Scandinavian countries which nearly reach spending levels of 2% of GDP. In the US, society spends 2.5–3% of GDP on universities, mostly out of private sources. Yet, even the public contribution to the budgets of US universities, as percentage of GDP, is larger than in Europe. This difference in the financial share is the main cause why staff-student ratios are so low in Europe compared to the US.

As a remedy the document by the European Commission on the modernization agenda for universities stipulates that, by 2015, 2% of GDP should be reached for expenditures on universities. The document of the EU Commission, however, leaves open how high the proportion of private funding (tuition fees, private donations, contributions by the business sector) and how high the public share should be.

## **5. Open science and open innovation**

Although this modernisation agenda contains interesting points, perhaps we even need a more fundamental concept to understand the future mission of universities. For what should universities stand in the future? For the universities, to be prepared for the 21st century, the concept to follow might be “open” science and “open” innovation.

In knowledge societies it will be more and more relevant that the bulk of new knowledge is generated and disseminated via rapid publication and by giving up the rights over it. Why is it of importance to keep the sciences “open” in such a way? The answer is that this openness facilitates the generation of further knowledge and helps young researchers, since they look for the best, the latest results from all parts of the world. It also helps students to be equipped with the most relevant knowledge, when they start working in the labour market. In addition, “open” science allows that the latest results are fed into the innovation system. Obviously, “open” science is connected with many benefits. An economist would say: open science is justified by its huge positive external effects. The concept of open science was introduced by Dasgupta and David in the 1990s. They have provided a clue to the analyses of the role

of universities in a modern society. By “open” science universities facilitate the working of knowledge societies and economies.

Of course, there are problems for establishing open science. The first one is an incentive problem. How do you convince the researchers that they should give up the rights over using the results? How do you get researchers be interested in rapidly publishing new knowledge? Yet, within the universities, there are monetary and hierarchical rewards to researchers, and in the scientific community there are reputational rewards. All that does the trick. So if you want to win the Nobel Prize, then you go for publication, because impact counts. So it is the reputational competition in science which drives the scientists.

In addition, there are career models in the universities which foster open science. Universities count the quality and quantity of publications. And of course it is important that universities have also specific monetary rewards related to open science. Hence the functioning of universities facilitates the working of open science. There is a publication problem, too. How to combine open access to scientific results with the financial issues involved in publication? How to combine the establishment of institutional repositories with new forms of publishing? The EUA, for example, supports open access, because that facilitates open science. Evidently, for quality reasons, universities are very much interested that the peer review continues with open access.

Of course, the resources for open science should come out of public funding. This public funding can be justified by to the existence of positive external effects.

Besides “open” science there is the concept of “open” innovation. The latter refers to academia business relations. Or to put it otherwise, universities, on the one hand, engage in open science but, on the other hand, also look for research outcomes, where they do not give up the rights over using the results. The question is: What is the optimal mix of having open science (which should be dominant) and of commercially using research results.

Why do universities look for such an optimal mix? One reason is that universities need the so called growth effect, need economies of scale, when third party funding is added to public funding of research. They can thus increase the impact of their research. In addition, the interaction with business and society when pursuing open innovation may improve the relevance of open science. This is a secondary effect. Admittedly, there can be negative substitution effects also. Research for business firms may substitute the pursuit of open science. So the decisive question is what is the optimal mix?

Finally, let me offer a definition of a university in the 21st century. Universities are effective institutions to manage open science and to link open science with open innovation involving society and business. As a consequence, universities are engaged in solving principal agent problems in creative work. The problem to solve by the university management is that creative work is mostly characterized by a non observability of the efforts the individual scientists or scholars and of the value of their output. The value of creative work can only be assessed in the future. In addition, creative work cannot be burdened by bureaucratic rules. Creative work needs many freedoms.

To sum up: Universities need academic autonomy, organizational autonomy, budgetary autonomy and autonomy in hiring, staff in order to act as autonomous agents in the knowledge society. Universities choose their own profiles, missions and values. They need modern governance structures so that they can solve the management problems of organizing creative work. The European university system should be characterized by a diversity and dynamics of institutions, ranging from research-intensive universities with global outreach to regional universities. Europe needs to foster the competition and cooperation among universities. Universities in Europe should no longer be nationally fragmented, but become part of a larger area as it is the case in the United States or how it is emerging in China.

We need European policies like the Bologna process in order to modernize universities. We need the European Research Council (ERC), because the ERC will create a common understanding of excellence in Europe (unfortunately, we still have too many provincial standards). And what we also need are regional policies, respectively cohesion policies, to guarantee equal opportunities for universities in Europe in the long run. Universities can also act as engines of regional innovation and may thrive when linked with the innovation policies of the EU or its member states.

Thank you for your attention!