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Answering the Global Challenge – Experiences from European Excellence Initiatives

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Introduction

The importance of the higher education sector is greater than ever before. Countries around the world have identified a more highly educated population as an essential ingredient in their response to the immediate challenges of the current economic and financial environments. Moreover, shifts in the global economic centre of gravity from west to east, demographic issues, the problems of coping with a still increasing world population, climate change, food and energy security, health concerns and a whole raft of other issues mean that the challenges facing all governments are chronic and go beyond the current and (hopefully) passing concerns of the global financial crisis.

The higher education sector has to play an essential role by providing the educated and capable people that make up an increasing proportion of both the private and public sector workforce that is responding to these challenges. In addition, the sector performs much of the research that seeks to understand and provide effective responses to global issues, to create the potential for generating new businesses and to provide opportunities for sustainable societies, economies and environments. In short, universities are major drivers of innovation and innovation is becoming essential across all areas of activity.

While the higher education sector is important as never before and governments recognise this, the sector is also subject to considerable pressures, escalating demands and a need to change. Student numbers are increasing in a way that puts pressure on infrastructure and teaching methods; costs are increasing at a rate higher than revenues; the diversity of the student population is increasing and this demands changes in pedagogy; public funding is becoming ever more constrained, not least as governments strive to respond to the financial conditions they face; there are increasing demands for accountability and the danger that this might lead to short-termism; and there are many other pressures, some specific to particular countries, some more general. One of the common themes across most countries is to increase the interactions between business and higher education institutions, specifically to gain a greater return on public expenditure in research.

All of these factors exist within a global environment. Highly talented people move freely between countries and the higher education sector in any country needs to have an international reputation for excellence if it is to attract the best people from wherever they might be. Moreover, many of the problems that university research seeks to address are themselves global and require an international response based on collaborative research. Research is and always has been an international activity, taking place through an invisible college of personal and institutional connections that in total produces value beyond the sum of its individual parts. However, effective participation in this network is not free, the necessary fee being a strong reputation based on the excellence of past outputs and the strength of existing capabilities. Visibility requires scale as well as excellence; and because many of the problems we face are complex and require interdisciplinary approaches, reputation also depends on institutions having a broad base of disciplinary expertise that they can draw upon to create solutions rather than just add to knowledge.

This highly competitive environment within which the higher education sector operates, combined with the demands flowing from a growing and ever more diverse student population, mean that the sector itself needs to innovate. Proceeding as in the past will not meet the new and still emerging demands that governments, business and the general community are placing on the sector. Governments and the higher education institutions themselves in many countries are responding to these pressures by trying new things and operating in new ways. This is leading to

increased diversity within the global sector as institutions specialise and focus their activities in different ways.

There is now a great deal of experience across different countries as they act in their own ways to improve the productivity and excellence of their higher education institutions. Each nation wants to create an international reputation for excellence that will attract students, academic staff and business. This involves change at the national level, in terms of programs, structures and policies, as well as action by individual institutions. It is important that Australia learn from and build on this experience and examine how we might benefit from the successes of other countries. While it would be naive to think it is possible to directly transplant an approach from one country to another, ignoring the cultural, historical, economic and other differences between them, it is also irresponsible to ignore the lessons of practical experience.

This paper describes and explores the lessons of the German Excellence Initiative (and a similar program from France). The Excellence Initiative is a major, national program that has helped and is helping to revitalise the German higher education sector by focussing on excellence, supporting success and promoting innovation within the sector. In setting out to support excellence by concentrating resources in institutions able to demonstrate a strategic commitment to superior performance, the program has influenced institutions across the whole sector – and had the deliberate intention of doing so. One of its underlying objectives was to target the perceived inertia in the faculty structure of the universities and it has served to create a new, more competitive culture which promotes superior performance even beyond those institutions receiving funding.

The situation in Germany

In 2004 German science leaders and politicians started to discuss how to strengthen the German university and research systems to increase their international reputation for excellence. One of the main drivers of these discussions was DFG, Germany's research funding organisation. DFG is an association under private law entrusted by the German governments to fund research projects in all scientific domains; its members are the German universities and DFG is self-governed, not part of the government.¹

The objectives of these discussions were to promote world class and internationally recognised research in Germany, to strengthen Germany as an attractive research location, and to increase Germany's international competitiveness and visibility in all fields of science and the humanities. One way of achieving this would be to establish centres of excellence, build efficient university–industry research hubs, and attract scientists from abroad.

In June 2005 these discussions and subsequent negotiations between the federal government and the Länder (State) governments set the overall framework for the Excellence Initiative. Important characteristics of the framework were:

- A focus on the development of structures within institutions, but not on individual universities;
- The envisaged funding mechanisms were to make use of existing organisations/schemes;
- Allowing for flexibility, to encourage diversity;
- The use of international peer review panels to allocate the funding.

1. DFG's annual budget in 2010 totalled € 2.3 bn (AUD 3.2 bn) sourced from both the federal government (2/3) and the Länder [states] governments (1/3). The latter provide the base funding of the universities in their jurisdiction.

The proposed initiative differed significantly from the traditional funding approach used in Germany because it would single out a relatively small number of institutions to receive large grants. Moreover, panels of international experts from outside Germany were to make recommendations on the distribution of funding. The traditional approach had been to allocate the available funding to universities throughout Germany equally.

This new way of allocating funding had the deliberate intent of inducing substantial and sustainable structural change in German universities while maintaining the Humboldtian principles that excellent teaching is based on excellent research and of the freedom of research.² By promoting a more collaborative approach, the initiative would also benefit infrastructure investments. Among the other benefits of the initiative are that it is creating thousands of high-quality jobs, is developing the specialists, experts and executives of tomorrow, and is contributing to innovation in business and industry. Most importantly, the initiative demonstrates how science supports society.

The official start of the 'Initiative for Excellence' was in 2006 when German universities were invited to propose new approaches towards world-class research and introduce structured PhD schools. Funding can cover fixed term contract staff (professors, academics, and administrators), infrastructure, consumables, travel, events/conferences, etc. of € 3 – 8 m p.a. (AUD 4.4 – 11.2 m p.a.) for each cluster for 5 years³.

This initiative is aiming to achieve three objectives:

- The establishment of structured PhD programs at German universities. An important and intended consequence of the initiative has been structural change which enhances both the quality and the international attractiveness of German postgraduate training. Prior to the Excellence Initiative only a few universities had strategies or structures for promoting early stage researchers. Until the early 2000s, only around 20% of doctoral researchers were participating in structured training programmes. The majority of all doctoral researchers were on the traditional doctoral track (1 candidate – 1 thesis – 1 supervisor).
- The clustering of regional research institutions around bottom-up defined topics. Excellence clusters aim to establish internationally visible and competitive research beacons at universities which can then cooperate with non-university research establishments (e.g. Max-Planck or other research institutes), universities of applied sciences and the private sector; and which offer an excellent environment for young scientists. The 37 clusters selected in the two funding rounds are receiving an average of €32 m each.
- Further structural change by enabling those who have already won a cluster funding and a research school to apply for further funding through a "future concepts" award. There is likely to be funding for 9 "future concepts" projects.

This tiered competition in which first round winners then become eligible to apply for additional funding is one of the distinctive features of the program. The future concepts awards are important because they complement and build on the first stage of the Excellence Initiative which is open to all and has transparent rules that provide equal opportunities to apply for all universities.

2. German constitution, art. 5-3

3. The foundation of the Excellence Initiative is a treaty-like agreement between the Federal government and the state governments which secures the funding at a 75%-25% shared budget and which identifies the Science Council "Wissenschaftsrat" (the strategic advising body on science matters with equal representation of science and states & federal governments) and the German Research Council "DFG" as implementing agents.

Initial outcomes

The initiative provides its peer reviewed funding for a limited period of time, even though the awarded clusters have to present a sustainability concept demonstrating a plan to continue after the Excellence Initiative funding runs out.

1st Funding Phase (2006 – 2012)	total € 1.9 billion (€ 380 million per year)
2nd Funding Phase (2012 – 2017)	total € 2.7 billion (€ 540 million per year)

The first funding phase competition selected outstanding projects in three areas:

- 39 Graduate Schools (Ø funding € 1 m p.a.) to promote young scientists and researchers;
- 37 Clusters of Excellence (Ø funding € 6.5 m p.a.) to promote cutting edge research;
- 9 Institutional Strategies (Ø funding € 12 m p.a.) on projects to promote top-level research.

This investment has already created more than 4000 new research and teaching posts and has had a sustained effect on changing the academic landscape. The impacts are being felt across the whole country, its economy and society.

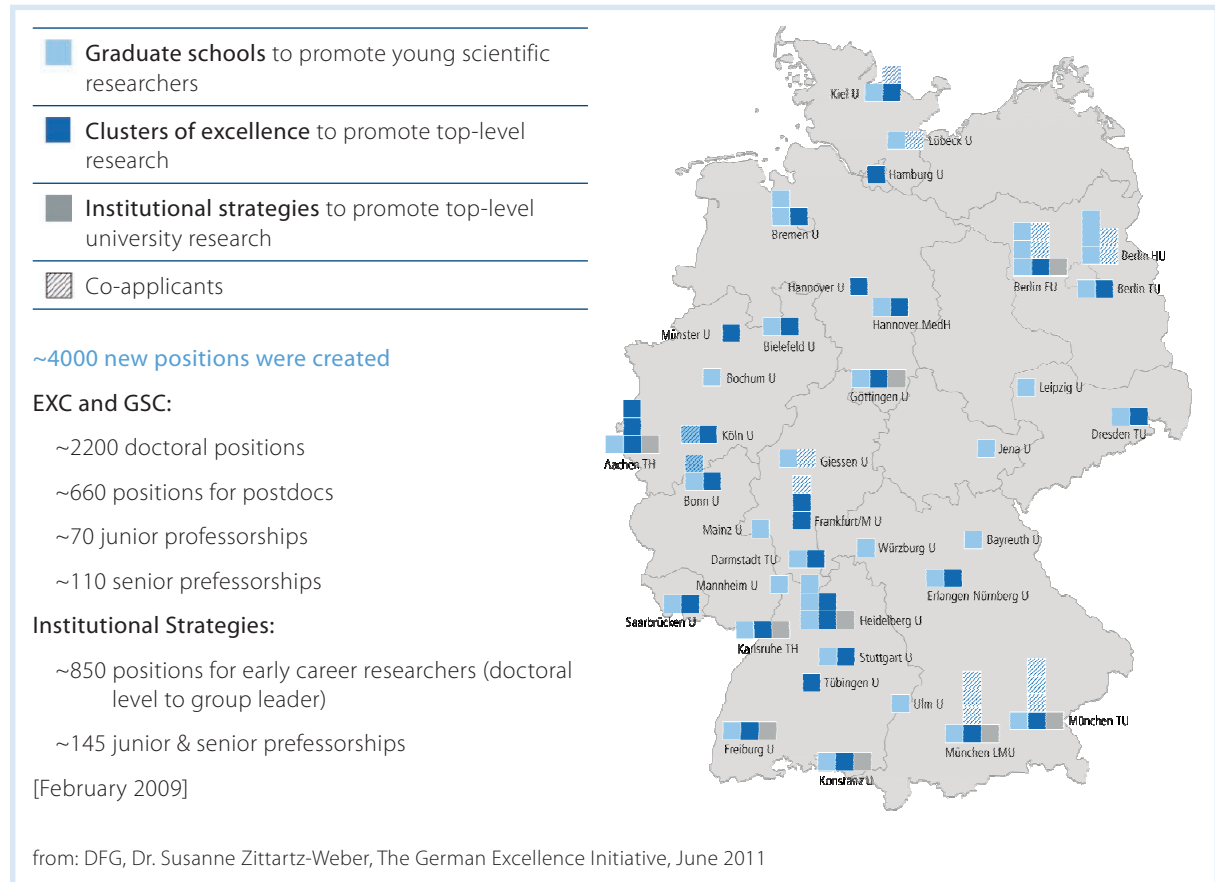
A number of the Graduate Schools have significant participation from industrial partners, whose contributions range from offering internships, training courses and business plans, to providing work placements, etc. One example is the Erlangen Graduate School in Advanced Optical Technologies. This collaborates with A.R.C. Laser, IZMP Erlangen, Lucent Technologies, Bell Labs Innovations, HumanOptics, WaveLight, ERLAS, ESYTEC, Promeos and Siemens Medical.

Excellence Clusters aim to combine the local resources available in universities with those available in independent research institutions, creating synergies which will strengthen the national research base. Co-operation between science and industry also plays a crucial role, not only in transferring research results into practical applications, but also in promoting dialogue and exchange. Eighteen of the 20 clusters selected in the second round collaborate with partners in industry or with other non-university institutions. The Cognitive Interaction Technology Cluster, in which participants from the Bielefeld Faculty of Technology collaborate closely with additional faculties (biology, linguistics, physics and psychology) and with Miele, Bertelsmann and Honda provides a good example. Another instructive example is the formation of the Normative Orders Cluster. This co-operates with non-governmental organisations to fund development work intended to support a research network geared towards young scientists studying the normative basis of development policy.

The base funding of the 68 research universities in Germany is predominantly provided by the Länder:

Land (state)	2003 (EUR bn)	Land (state)	2003 (EUR bn)
Baden-Württemberg	8,15	Niedersachsen	9,26
Bayern	7,77	Nordrhein-Westfalen	6,88
Berlin	7,21	Rheinland-Pfalz	5,91
Brandenburg	5,85	Saarland	9,26
Bremen	5,75	Sachsen	7,58
Hamburg	7,33	Sachsen-Anhalt	7,82
Hessen	5,65	Schleswig-Holstein	7,37
Mecklenburg-Vorpommern	8,29	Thüringen	7,41
Bund (federal government)		7,29	
Total		117,20	

The geographic distribution of the projects from the first funding phase shows the regional impact of this initiative:



Encouraging results of the first phase

The first phase of the Excellence Initiative proved to be an instant success. This triggered a substantial increase in the funding for the second round.

One illustration of the success of the Excellence Initiative is that it seems already to have led to an improvement in the global ranking of some of the supported universities. For example, the Technical University Munich moved from 57 in 2008 to 47 in 2011 in the ARWU ranking.

The Excellence Initiative has also had substantial indirect effects, reflecting the regional distribution of the funding streams. One example of these indirect effects can be seen in Berlin. This involves the recent establishment of the Einstein Foundation Berlin to serve as a regional support scheme to mitigate the adverse effects of the transition towards new structures in the three universities in Berlin.

Established by the state of Berlin in 2009, the Einstein Foundation Berlin supports Berlin's research both financially and structurally. The Foundation is an unincorporated and non-profit entity subject to the Berlin Foundation Act, under state oversight, which is led by the Berlin Department for Justice. In addition to revenues generated from its endowment, the foundation has access to financial support from the state of Berlin. The foundation is also able to receive donations and capital contributions. An independent scientific commission identifies the funded projects. The goals of the foundation are to:

- Support excellent research projects.
- Raise the visibility of Berlin as a place for science e.g. through the funding of new professorial positions with up to € 1 m (AUD 1.4 m).
- Enable new forms of cooperation between universities and research institutes.
- Evaluate new fields of research and in an advisory role, assist in setting future priorities.
- Initiate collaboration between research institutes and corporations.
- Establish an institutional platform for future forms of cooperation and collaboration within the research community.
- Raise the interest amongst world class scientists to increasingly collaborate with institutions in Berlin.

Proposals for the Final Round of the second phase

The second phase of the Excellence Initiative is entering its final stage. German universities have submitted their full proposals for the competition, including projects that are already receiving funding and new projects. By the 1 September 2011 deadline, the DFG had received 143 proposals, 84 of which were from projects that had been receiving first phase funding since 2006 or 2007; and 59 that successfully passed the preliminary selection of the second phase in March 2011.

In terms of the three funding lines of the Excellence Initiative, 63 of the 143 proposals submitted were for graduate schools (38 of which are already receiving funding & 25 new projects), 64 for clusters of excellence (37 already receiving funding & 27 new) and 16 for institutional strategies to promote top-level research (nine already receiving funding & seven new).

The submitted proposals will now enter the scientific review process. Over the coming months, 37 panels made up of around 480 researchers from around the globe will assess the 63 proposals for graduate schools and the 64 proposals for clusters of excellence. The 16 proposals for institutional

strategies to promote top-level research will be evaluated on site by review panels under the guidance of the 'Science Council'. Around 200 experts (of which just 20% are German) have been recruited to serve on these review panels.

Funding recommendations will be made in June 2012 on the basis of the reviews. Following consultation by the respective commissions of the DFG and the 'Science Council', the final decisions will be made on 15 June by the Grants Committee for the Excellence Initiative, on which the federal and state Ministers responsible for science and research are represented. Funding of the approved projects will begin in November 2012, based on a total budget of € 2.7 bn (AUD 3.8 bn) over five years.

Some observations by German universities on the Excellence Initiative

The move from a largely egalitarian system to one which leads to a concentration of funding based on excellence involved a major cultural shift. One of the reasons the universities supported the program was that it was bottom-up, with the universities themselves determining the areas that should attract funding support, independent of any national research priorities.⁴ Another important learning from the initiative was that it is essential to establish a clear and responsible leadership in the clusters if they are to serve as a focus for effective and efficient collaboration.

One of the most interesting features of the Excellence Initiative is that some of its most important effects are indirect and still to appear. This is because the base funding of universities remains level (at best) over the period of the initiative funding but universities are contractually bound to continue the initiative projects, even after the initiative funding runs out. As a result, there will need to be major structural change within the universities that have received funding under the initiative as they reduce activity elsewhere to support the areas of excellence they have built.

The political intent to promote such structural change within the universities was not explicit during the development of the program because of the emphasis on research excellence as its major objective. Universities became fully aware of the underlying agenda only as it became apparent that there was to be no increase in the 'business as usual' funding. The success of these consequent structural changes will require considerable work by the excellence clusters in promoting and explaining the broader benefits that will arise at institutional as well as cluster level from the changes that will need to occur.

Article 8 of the Excellence initiative agreement requires the DFG and the Science Council to provide a report by June 2015 setting out the progress of the program. An international experts' committee will assess the impact of the Excellence Initiative on both funded and on not-funded universities by January 2016. It remains to be seen what political framework will then be in place and what the financial options for fostering further gradual change will be.

A similar initiative to encourage structural change at French universities

Like Germany, France has also introduced a scheme which moves from its traditional egalitarian

4. An operational concern with the Initiative was that it was necessary to submit proposals in English. This was because most of the 1000 internationally recognised experts evaluating proposals were not German. The requirement to use English did cause debate as some professors felt that this could prejudice their applications. There was also some discussion as to whether it was best to use the DFG as implementing agent rather than set up a new (internationally recruiting) institution to implement the program.

model in which universities are equal to one which, by promoting heavy investment in areas of excellence will lead to a clear stratification within the overall system.

In January 2008, the French government announced the implementation of the 'Plan Campus', a policy aiming to develop ten competitive university clusters of international level (now relabelled: pôles de recherche et d'enseignement supérieur [PRES]). The criteria for funding are that:

- the projects must include cooperation between public and private sectors concerning investment and real estate management
- the urgency to invest in infrastructure
- the education and scientific expectations
- the development of a campus
- the project should be coherent with the overall objectives of the national objectives.

The government has already invested € 5 bn in the PRES initiative and it allocated another €7.7 bn to the program in 2010 ready for implementation in 2012. The purpose of the initiative is quite explicitly to establish world class universities having a level of excellence that will enable them to compete for the best students and staff from anywhere in the world.

The PRES aims to have universities, grandes écoles and research institutions align their different objectives and benefit from the joint utilisation of their infrastructure. Twenty one PRES comprising nearly 60 universities and many higher education institutions (engineering schools, business schools, hospitals...) were in place in early 2011.

This French initiative has similar objectives to the German Excellence Initiative but faces a very different structure in the French research and higher education landscape. A strong focus on regional impact demonstrates the ambition of the French government to empower regional centres outside Paris. The overall volume and the political intentions of the PRES programme distinguish the two initiatives.

Conclusions

The French and German excellence initiatives have both had the explicit intention of concentrating resources in areas of superior performance and potential to build the nations' research capability and international reputation for research excellence. In both cases this has involved a significant change from the traditional egalitarian approach of all universities having equal status and will lead to an explicit stratification within their university systems.

An important characteristic of the German program was that it was bottom-up, responding to proposals developed by the universities themselves, independent from any national research priorities. The universities identified this as a major factor in allowing them to respond effectively to a program that required a huge shift from traditional ways of doing things and which put in place a new cultural paradigm for university funding. The use of internationally recognised peer reviewers also gave the process credibility and emphasised that implementation of the initiative was at arm's length from government.

One of the distinctive features of the German program is that it operates in two tiers – the first open to all universities, the second only to those that were successful in the first stage. This facilitates an even greater focussing of resources on those areas already identified as being excellent through a national peer reviewed process. Both stages operate according to transparent rules, which adds to the sector's confidence in the process.

The German initiative has produced visible benefits quickly and led to a major cultural change that has promoted specialisation and extended beyond the institutions receiving funding. These changes included improvements in the efficiency and effectiveness of university research and postgraduate training. It is noteworthy that universities had to think and work strategically to position themselves to take advantage of the initiative. This is providing benefits (for example in governance arrangements) whether or not they were successful in receiving funding.

The emphasis on promoting strategic collaboration focussed around acknowledged excellence has served to facilitate and encourage the development of linkages between different kinds of organisations. Clustering provided clearly visible regional centres of excellence which are self-governed, durable and sustainable. This strategic collaboration has improved the two-way flow of information, people and funding – for example in business participation in postgraduate training. The initiative has also led to supportive changes in the broader innovation system, as exemplified by the establishment of the Einstein Foundation Berlin.

These are still early days and the full impact of both initiatives has yet to work its way through the system, as discussed above. Nevertheless, it is already apparent that a program building on excellence and concentrating support where it can have most effect is already providing significant benefits for Germany.

