Changing funding modes for junior scholars

Indra Willms-Hoff
VolkswagenStiftung, Kastanienallee 35, 30519 Hannover, Germany

Challenges/background

In preparation for this chapter, I started to think about some of the things we take more or less for granted when considering funding: that we should aim for more internationality, encourage cross-disciplinary interactions, flexibility and risk taking, and preferably reach young researchers, and whether these are really the aims we should try to achieve.

Living in Germany these days you cannot help but watch with some amazement how arbitrary people act in different settings, for example, politics. In the last elections, the CDU (Christian Democratic Union)/CSU (Christian Social Union) managed to lose approximately 15% of the votes in comparison with the first polls. As a result, acting-Chancellor Schroeder announced that in effect he [and the SPD (Social Democratic Party of Germany)] had won the election, because they lost less votes than expected. This resulted in a situation where the two prominent party leaders were in turmoil over the process of establishing a grand coalition. While, at the time of writing we are still awaiting the final settlement of this situation, we should try to learn from this discouraging example.

Although the political arena is obviously different from the scientific space, a large number of our politicians were educated in our universities and this example showed me:

1. the importance of flexibility, i.e. that people are able to react adequately if an unexpected and difficult situation arises;
2. that people have to learn to work in non-sectorial or interdisciplinary settings, i.e. they must be able to interact productively with others who have different backgrounds and possibly quite different intentions;
3. they have to learn to take risks and they should not shy away from the consequences if situations become more difficult than expected.

Returning to the subject of science, I am convinced that the ability to overcome national and disciplinary boundaries is becoming increasingly essential for researchers, not only within the sciences but also in the humanities and social sciences. Since the quality and accessibility of new knowledge, as well as relevant research and technological development are decisive for the future well-being of our societies, scientists should be able to play a prominent role in the development of Europe into a knowledge-driven society.

1 Email: willms-hoff@volkswagenstiftung.de
I. Willms-Hoff

Institutional problems

Traditionally doctoral students in the sciences receive individual training within the setting of a research group, while in the humanities they are often quite isolated with little contact and advice, which comes only from their supervisor. In either case their training too often remains strict within the boundaries of the respective discipline, as the students here are only connected to their research group and not integrated into a graduate school. This is at least in part a consequence of the way funding is paid, through individual grants to supervisors, an institute’s part-time positions or individual stipends to the PhD students themselves.

In the sciences, the period following gaining a PhD usually comprises 2–3 years of postdoctoral experience, which is often abroad (which for the majority used to mean the USA), paid by stipends [e.g. in Germany by DFG (German Research Foundation)] and time-restricted. Afterwards as an ‘Assistant’ or ‘Habilitation’, scientists are still dependent upon the head of the research group. In Germany, in a number of disciplines the ‘Habilitation’ is still a prerequisite (or at least an extra asset) in order to gain a permanent position, which also implies that young researchers remain dependent upon established professors. On average they are not independent before the age of 40 years, which is considered past the prime time for individuals to significantly break new ground.

While funding agencies increasingly encourage interdisciplinary approaches, the classical career path still ensures that a call for a professorship or another permanent position depends mainly on disciplinary experience and publications in established journals. Even if there are changes within the institutional set-up, for example, through the establishment of cross-disciplinary centres like the Bernstein Centre for Computational Neuroscience or the newly founded Frankfurt Institute for Advanced Studies (FIAS), where scientists from different theoretical backgrounds work together researching complex systems, the majority of young researchers still face an uncertain future if they pursue what we ask for, namely to leave the trodden path and engage in innovative and therefore often risky research.

The same uncertainty is true for scientists who follow non-linear career paths and cross the bridge between the academic and the entrepreneurial or administrative sectors. While it is well established in the engineering sciences that experience in a company is as important for a professorship as academic training, changes between the system of higher education and jobs within administration or companies should also become the norm, not only in all the sciences but also in the social sciences and humanities, thereby further diminishing the gap between society and the university system. A long-term commitment by funding institutions is therefore needed, helping to create alternative settings.

European perspective

The European Union (EU) has vowed to create a European Research Area (ERA) following the Lisbon European Council in March 2000, which set out a very ambitious strategic goal for the EU, namely to become the most competitive and dynamic knowledge-based economy in the world by 2010. The Council made a
commitment that: “Research activities at national and Union level must be better integrated and co-ordinated to make them as efficient and innovative as possible and to ensure that Europe offers attractive prospects to its best brains and to achieve this objective in a flexible, decentralized and non-bureaucratic manner”. In March 2002, the Barcelona European Council Presidency Conclusions called for the adoption of the Sixth Framework Programme and its legal instruments, and for an agreement “that overall spending on R&D (research and development) and innovation in the Union should be increased with the aim of approaching 3% of GDP (Gross Domestic Product) by the end of 2010” — an ambitious goal in view of the present 2%.

Even if it seems to be clear that Europe will be unable to achieve most of the Lisbon and Barcelona goals by 2010, the goals themselves remain valid, and Europe-wide action towards them is needed more than ever before. It remains to be seen if all the creative effort and energy that went into the plan for establishing a European Research Council (ERC) [1] will succeed in contributing to these goals.

Consequences for doctoral and postdoctoral education and training in Europe

In Europe, different approaches to broaden doctoral and postdoctoral training can be observed. The EU awards ERASMUS (the European Community Action Scheme for the Mobility of University Students) stipends to encourage students during their studies to spend one or two semesters in another European country, thus gaining an international perspective and experiencing an academic structure and environment different from their home country. The Marie Curie Research Training Networks also target junior scholars with less than 4 years research experience (postdoctoral fellows). A Research Training Network usually consists of a consortium of institutions in several European countries aiming at jointly educating and training postdoctoral fellows, which may also include experienced post docs. In addition, the stipends are awarded to individual researchers.

In Germany, small-scale graduate schools (Graduiertenkollegs) were established in the 1980s to overcome often isolated individual training in order to ensure the broader education of PhD students by promoting interdisciplinary experience and exchange with other scholars. At present, more than 300 of these topically defined graduate schools exist in German universities.

Since the winter term 2000/2001, 37 Max Planck Research Schools were established to bridge the gap between institutional boundaries by connecting excellent research institutes of the Max Planck Society and the universities, by offering PhD students from different nationalities a broad range of theoretical and experimental training opportunities related to their field, including courses in rhetorics and scientific publishing. Some of these Max Planck Research Schools also include institutions located outside Germany, e.g. in The Netherlands.

In France, the integration of PhD graduates into the non-academic workforce, in particular, is inadequate compared with other countries and is fraught with difficulties. More than 10% of researchers who obtained their PhDs in France in 2001 were unemployed in 2004, and an additional 25% were employed on temporary contracts. This apparent surplus of qualified scientific workforce
starkly contrasts with other OECD (Organisation for Economic Co-operation and Development) countries and the global job market, in which PhD graduates are generally in short supply. In the light of this global view, it is clear that the real problem is an insufficient capacity of the French economy to absorb the scientific workforce rather than an excessive ‘production’ of PhDs.

Non-PhD engineers (who might compete with PhDs in the natural sciences) traditionally occupy a dominant position in the relevant section of the French job market, and there is a general emphasis on non-research-based degrees obtained through national competitions. In addition, however, employers seem to lack appreciation of the specific skills acquired through research training and the general and broad applicability that these have (beyond traditional R&D positions). All too frequently a doctorate is seen more as an intellectual exercise with modest value and as an (unnecessary) extension of the required training period, rather than as an important first professional experience in a true ‘profession’. Consequently a training system that is transparent and comprehensible to non-academic employers and human resource managers will be an essential prerequisite for a better integration of PhD graduates into the French workforce.

The working group FutuRis therefore recommends [2] the professionalization of doctoral education in order to make PhDs more attractive to both the academic system and companies. Based upon the example of American graduate schools, the establishment of ‘écoles doctorales’ is recommended, where contracts between the individual graduate student and the graduate school are drawn up, so their respective responsibilities are fixed. The more general parts of the education, such as English, scientific communication, project design and entrepreneurship among others, shall be provided by a ‘collège doctoral’ as a joint initiative of several ‘écoles doctorales’. These recommendations also take into account more recent developments in the USA to further formalize and at the same time broaden PhD training, including, for example, ethics, intellectual property and technology transfer, proposal writing and teamwork, where new models were developed by the Carnegie Institution for the Advancement of Teaching. A similar scheme was also proposed for postdoctoral education [3].

New funding modes for post docs are geared towards the funding of a group and not just the single PI (principal investigator), for instance the Emmy Noether groups funded by the DFG in Germany. On a European level, the European Young Investigator (EURYI) awards were launched in 2003 by the Heads of Research Councils (EUROHORCS) and the European Science Foundation (ESF) to attract the best young European scientists. The awardees are granted up to €1.25 million to pursue an independent research career and to build up a research group. A first evaluation was performed in 2005. Although the award “was seen by the applicants as highly attractive compared with other national schemes and other European and international schemes … a major critique has been the selection of many senior applicants, lack of mobility and doubts about the awards’ added value for European research” [4]. For the future “forward oriented criteria imply less weight on comparing past merits across disciplines, and more weight on groundbreaking research proposals and how the award will improve the research conditions of the applicant” [4]. To avoid a situation where “promising young PIs are ousted by well established researchers there seems to be a need to revise the eligibility criteria” [4].
The Human Frontier Science Program (HFSP) funding is also geared towards international, innovative and interdisciplinary approaches, where the young investigators’ grants are exclusively for teams of scientists who are all within 5 years of establishing an independent laboratory (and within 10 years of obtaining their PhDs) and the programme grants aim preferentially at younger scientists. Besides an interdisciplinary approach, international collaborations are encouraged, and scientists involved in a local collaboration are merely considered as a single team member for budgetary purposes. The recent HFSP progress report [5] shows that while only 13 awardees went to other EU host countries, 233 co-investigators from 16 countries work together with PIs from eight countries. Over the years, the award has attracted an increasing number of scientists from non-biological disciplines — nearly one-third in 2005 compared with only 3% in 2001, thus also living up to the goal of encouraging interdisciplinarity.

The role of foundations

The Volkswagen Foundation is a not-for-profit foundation chartered under private law. It is not affiliated with the Volkswagen company, but is a result of its privatization. It was set up in 1961 with the objective of supporting science, the humanities and technology in research and university teaching, and started its activities in the spring of 1962.

Its origins are based on a government treaty between the Federal Republic of Germany and the State of Lower Saxony, which settled the controversy over the ownership of the Volkswagen company after 1945. The then Volkswagenwerk GmbH was converted into a joint stock company under German law. The Federal Republic of Germany and the State of Lower Saxony each received 20% of the shares, while the other 60% were converted into private ownership by issuing so called ‘peoples shares’ (Volksaktien).

The proceeds of roughly € 0.6 billion resulting from the sales of these shares, and the entitlement to the profit arising from the other 40% were transferred as assets to the Volkswagen Foundation. In 1988, the Federal Government sold its remaining shares, and the Foundation then received the entitlement to another € 405 million, subject to the terms of a special contract.

Today, the Foundation’s capital amounts to € 2.3 billion. The funds for grants are drawn from the income from the Foundation’s asset allocations. Currently, the Foundation is able to fund research in the order of € 90–100 million per annum. Approximately 15 funding initiatives are run on a rolling basis, and mainly fund interdisciplinary, innovative research, with approximately half awarded to the humanities and social sciences, the other half to the natural and engineering sciences. Since 1962, more than € 2.8 billion have been granted in the form of approximately 27 000 awards. These figures clearly show how sustainable the capital invested into a foundation is and how its funding initiatives can develop over time.

Because of its own assets the Volkswagen Foundation is independent in making its decisions. The Federal Government and the government of Lower Saxony each appoint seven members to the board of trustees, which is the only control they exert over the foundation’s activities.
The Foundation provides funds for specific purposes to non-profit institutions engaged in research and higher education. It regards it as its duty to initiate research into subjects and fields that for various reasons are not covered sufficiently by the federal or state governments, or by other grant awarding institutions. It concentrates its activities on specific funding initiatives to stimulate developments, redress imbalances and create role models. The Foundation considers it particularly important to establish highly qualified research capacities in new areas of research that hold promise for the future, especially when this involves identifying important new problems and contributing to their solution. The focus lies especially on interdisciplinary and international co-operation in research.

The VolkswagenFoundation demonstrates how foundations can contribute to structural changes by setting examples and encourage new approaches. In Germany, the first ‘Graduiertenkollegs’ were funded by the VolkswagenFoundation in collaboration with the Thyssen and the Bosch Foundations before the DFG started its respective programme. Similarly the junior research groups — ‘Nachwuchsgruppen’ — paved the way for the ‘Junior Professur’ and the Emmy Noether Groups, which aimed at giving some of the most talented researchers independence at a younger age.

With its newest funding initiative supporting young researchers, the Foundation aims at combining support for both individuals as well as institutions. With these ‘Lichtenberg Professorships’ the VolkswagenFoundation will provide support to outstandingly qualified (junior) academics in connection with innovative fields of research located between disciplines, as well as new teaching concepts within the respective academic environment. The funding, which will be made available for a period of up to 8 years, is expected to pave an interesting new path in higher education. On the one hand, young scholars will be offered prospects for a kind of ‘tenure-track’, and on the other hand, institutions will gain a better basis for planning, both from a strategic viewpoint with respect to content and institutional structures as well as concerning personnel development in the sense of long-term capacity building.

Within the framework of the ‘Lichtenberg Professorships’, an evaluation is made after approximately 4 years, which is done together with the universities to set positive examples on the way to establish a functioning tenure track system in Germany. This process should help in trying to avoid the downfalls of former ‘Hausberufungen’ (in-house appointments) by ensuring a high standard of evaluation through the participation of experienced researchers from outside the respective university, preferentially including scientists from abroad.

Another initiative targets young investigators in the political and social sciences that looks to provide financial and other incentives to develop intercultural competences and a common European perspective. The European Foreign and Security Policy Studies initiative is a joint research and training programme that was launched in 2004 by three European foundations — the Compagnia di San Paolo, Turin, Italy, the Riksbankens Jubileumsfond, Stockholm, Sweden and the VolkswagenFoundation.

The participating foundations are convinced that the national views that dominate academic and practical approaches towards a Common Foreign and Security Policy (CFSP) should recede in favour of an international perspective. The envisioned research and training programme aims at developing such a perspective for young researchers and practitioners in their further qualification.
The programme also aims at mobility across borders and between the academic and practical spheres. The candidates can work at academic institutions of their choosing or appropriate (European) organizations that are engaged in CFSP. Each participant in the programme will be funded for up to 2 years. At least half of the time should be spent abroad in an academic or practice organization. Individual activities should be combined with the active participation in conferences and summer schools involving the other researchers funded in this initiative, with events being held every 6 months. Joint publications and Internet presentations could serve as further instruments for supranational networking.

Candidates who can receive funding are young researchers and practitioners who wish to undertake postgraduate or postdoctoral research in the field of CFSP. They are selected according to personal qualifications and the quality of their research proposal, and are interviewed by a selection committee comprising representatives of the three foundations. Discipline, nationality, or citizenship of an EU member state are not essential criteria for the application process. Candidates who have passed the research and training programme should be able to work as university teachers, as analysts for institutes or ‘think tanks’, in the media, the civil service, or for political NGOs (non-governmental organizations). The first promising 26 awardees were selected in the spring of 2005. In total, the three foundations expect to grant 80–100 fellowships.

In Switzerland, an entrepreneur, Branco Weiss, started the fairly unusual fellowship programme Science in Society for young scientists. Here the applicants should already have a strong background in the sciences and demonstrate in their proposal that, while keeping their base in the sciences, they should be able to integrate questions related to the future of our society into their research. The Branco Weiss Fellows are free to choose the institution that they feel is best suited to their particular programme. As with the initiatives discussed earlier, regular meetings of all awardees are an essential part of the funding.

These last two examples show that it is crucial that research and research funding institutions open up new career perspectives to young researchers, and that other bodies, like the ones named above, are also responsible for encouraging young people to broaden their horizons.

Selection as part of the funding process

The selection process is essential to the success of any new funding instrument. The traditional written review process, where a proposal is sent out to two or more referees (depending on the amount of money, the range of disciplines, or specific methods involved) who return their opinions of the proposal to the respective funding agency, has its limitations, especially if young investigators and/or interdisciplinary approaches are the target of a call for applications. Experience at the VolkswagenFoundation has shown that it proves more difficult to obtain clear recommendations regarding interdisciplinary projects by following this procedure. Even if the different specific areas of expertise of the proposal were reviewed by a certain-number of experts, usually none of them were able to comment on it as a whole, and this often resulted in cautious and more tentative statements which only addressed the aspects of the project that he or she felt.
comfortable with. Review panels were established in the late 1980s. These usually comprise of six to eight scientists from different fields, often engaged in research outside Germany, who meet once or twice a year to discuss all the proposals in the respective funding initiative. This had (and still has) two advantages. First, the experts can discuss with their colleagues with complementary expertise whether the concept is in general so innovative/excellent from one point of view, that it is acceptable to use a more standard approach, or vice versa that even though the idea is very promising, neither the methods nor the experience of the applicant are adequate so the project cannot be funded. The other advantage is the comparative view gained from evaluating 15–20 proposals at the same time and setting high standards for the selection criteria when the committee meets for the first time.

For the selection of young PIs, a personal interview should be mandatory, at least if, as it is the case with the EURYI, Emmy Noether or Lichtenberg-Professorship schemes, a whole group is to be funded and therefore other people will be dependent on the qualifications of the awardees. In this context, qualifications need to extend beyond scientific expertise, including the ability to lead a group, to be able to interact with others from different backgrounds, and ‘personal maturity’, to play a major role during the interview process. The VolkswagenFoundation has developed a procedure that includes both the written review and an interview to deal with applications to the Junior Research Group Programme. Initially, the proposals are sent to three experts in the field in order to identify the 12–15 highest ranked applications. The potential group leaders then present their ideas and themselves to an interdisciplinary committee. This scheme is also in use for the ‘Lichtenberg-Professorship’ selection process.

Although they have their benefits, committees also have their pitfalls. After a committee has met several times, it may begin to have predefined ideas about what ‘the committee’ accepts and what it does not, thereby narrowing the overall view, which could result in the exclusion of more novel approaches. One solution is the introduction of changes to the composition of the panel on a regular basis; however, this will not completely solve the problem. Another problem that arises from the committee procedure, for example, for the ‘Lichtenberg-Professorships’, where the candidate presents themselves and their proposal, is that it is not always possible for all the panel members to remain independent of their personal sympathies and antipathies, and therefore, non-scientific bias can be introduced into the discussion. It may also be the case that referees can find themselves taking a position between the expectations that a funding agency (presumably) has and their own personal role as guide and mentor to younger scientists.

These examples were not aimed at questioning the indispensability of the peer review and selection process in general; however, the results of the questionnaire used to evaluate the EURYI awards [4] showed that, at each step in the process, only 20–30% of the applicants felt that the selection was unbiased and determined by ‘real’ experts (while nearly 19% regarded the domestic or process as partial). This shows that you have to think very carefully not only about the aims of a new funding scheme but also about its implementation, starting with the selection of grantees. Of course, there may be an understandable bias on the side of the applicants who were rejected, blaming their failure on others, rather than themselves; however, this is a serious point, particularly when only 7% of those questioned felt that the best applicants had been selected.

© 2006 Portland Press Ltd
Outlook

In October 2005, in an interview with the German newspaper *Die Welt*, Peter Gruss, President of the Max Planck Society, emphasized that although Germany is a leading producer of patents and ranks highly in publications, there are still deficits with respect to the autonomy of researchers and the financing of universities. At present in Germany the future is neither too bright nor too bleak. After a long political bind the Federal Government and the ‘Länder’ finally agreed in June 2005 to proceed with the so-called ‘Exzellenzinitiative’ [6]. Currently, the DFG is in the process of selecting the best proposals from universities of excellence (27 applications), ‘Graduiertenschulen’ (135 applications) and research clusters of excellence (157 applications). At least there is some hope that this will not only lead to extra funding in the range of € 1.9 billion from 2006 to 2011, but also contribute to real and notable changes in the university structure. Let us hope that on a European level the ERC will be implemented successfully, and — and this is unfortunately not obvious — that it will be able to live up to the high expectations that were raised beforehand.

Hopefully, in the future, changes in funding procedures will result in scientists who have broader and more creative minds, and also change the thinking of politicians, who through training at our universities, will able to make different decisions from those mentioned at the beginning of the chapter.

References

3. Carnegie Institution for the Advancement of Teaching (www.carnegiefoundation.org)
6. Eckpunkte eines zukunftsfähigen deutschen Wissenschaftssystems — Zwölf Empfehlungen (www.volkswagenstiftung.de/presse-news)