



researchers patent making the most of talented



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1

Ambition

It is the Netherlands' ambition to be among the leaders in the European Union in the pursuit of the knowledge society. To realise that ambition, our country needs highly educated people capable of producing, absorbing and utilising knowledge. Everything hinges on talent and how much scope we are able to give it, whether we are talking about breakthroughs in fundamental research or successful social or economic innovations. We are working to cultivate such talent on a number of different fronts, most specifically by developing an attractive, high-quality educational system. The measures I will be taking include introducing student rights to government funding of their education, along with the associated funding formula; making the system of higher education more transparent; and developing associate degree programmes and education related research activities at institutions of professional education. This memorandum describes my plans for the education and training of young researchers at universities and research institutes, and how I intend to promote excellence.

Compared to other countries, only a small number of doctorates are conferred in the Netherlands. Although that number is rising, there are signs that fewer students are interested in pursuing a doctorate. In particular, science and technology faculties are having real difficulties recruiting doctoral candidates. Another problem is that the Netherlands increasingly has to compete with other countries for talented young researchers. We must therefore make it more attractive to talented students to pursue a doctorate, offer researchers better career prospects, do more to encourage women and ethnic minorities, and support greater mobility, not only between countries but also between sectors. We should, furthermore, look more critically at the organisational structure within which talented students are trained as researchers, and in particular at the quality of our doctoral programmes.

I would like to make the pursuit of a doctorate more attractive by modernising such programmes and encouraging more differentiation in them. Doctoral candidates must be given better guidance and more freedom; the programmes themselves should be broader in scope; and the length of the programmes and their performance must both be improved. Doctoral training should also make more allowance for the labour market beyond academia. I have set aside a budget to subsidise the reform of doctoral training. I also want to give creative students more freedom to pursue their own interests in these programmes. With that aim in mind, I will – commencing in 2007 – make monies available for personal grants. In addition to the reforms themselves, differentiation in the programmes can also increase their appeal. Such differentiation must, however, meet the necessary quality criteria and the requirements of the organisational context.

The quality of Dutch research programmes is excellent, and that excellence can, to some extent, be attributed to the research schools and the system of trainee research assistants.

The introduction of graduate schools, as suggested in the position paper produced by the Association of Universities in the Netherlands (VSNU), *Hora Est!*, should not lead to the disbandment of successful alliances that have developed in the research schools. I will monitor the quality of the doctoral programmes by requiring the universities to submit to an assessment of the organisational context within which their doctoral programmes are run (for example research school, graduate school or a combination of the two). The new Higher Education and Research Act will make such an assessment compulsory. The Royal Netherlands Academy of Arts and Sciences will be charged with carrying out the quality assessments and developing quality requirements.

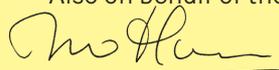
The Innovational Research Incentives Scheme (*Vernieuwingsimpuls*) is a success, but experience shows that there is quite a big time gap between the conferral of a doctorate and the submission of an Incentives Scheme proposal. Therefore the Rubicon Programme will be extended for another five years after 2005. With a Rubicon grant, promising doctorate holders can spend a two-year period at a foreign institution or a one-year period at a Dutch institution. Along with the funding that I have set aside to give talented doctoral candidates greater freedom in their doctoral research, we have now covered all the various stages that outstanding young researchers go through: their doctoral programme, the period immediately thereafter, and the next stage in their careers, in which they can start to pursue their own lines of research with the help of the Veni, Vidi and Vici grants under the Incentives Scheme.

More must be done to encourage talented women and ethnic minorities. This Cabinet will be supplementing previous measures that have led to a rise in the percentage of female senior university lecturers and professors. An updated Aspasia Programme has been introduced, and performance agreements will be concluded with the universities concerned in which they commit themselves to appointing more women to senior academic and executive positions. It is my aim that at least 15 percent of all professors should be women by 2010. With a view to promoting diversity, better use must also be made of the potential of ethnic minority researchers. Efforts are already ongoing in that direction in the Mosaic Programme, run by the Netherlands Organisation for Scientific Research (NWO).

It is the personal qualities of the researchers that must take precedence in career policies. Those with talent should have the opportunity to take the next step in their careers. I will discuss this with the universities and research schools, and also draw their attention to the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

Dutch universities and research schools increasingly have to compete with those abroad for talented young researchers. That is why it is important for our country to remain open and appealing to talented foreign researchers. A new fast-track procedure was introduced on 1 October 2004 to ease the entry of knowledge migrants into the Netherlands, and efforts are also being made at European level to relax restrictions in the case of third country researchers. It is important to the careers of Dutch researchers for them to gain experience abroad. I therefore wish to encourage mobility, both geographically and between sectors.

Also on behalf of the State Secretary for Education, Culture and Science Mark Rutte,



Maria J.A. van der Hoeven, Minister of Education, Culture and Science

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What is the problem?

Number of doctorates

The number of doctorates conferred in the Netherlands is among the lowest in Europe (EU-15). The United Kingdom, Sweden and Germany confer two to four times as many doctorates per head of the population a year as the Netherlands, not only in terms of the total number of doctorates, but also in terms of the number conferred in the sciences and technology. Only Italy has a lower score (see tables below).

Doctorate holders (ISCED 6) per 1000 of the population of 25-34 year olds in EU-15, United States and Japan

	2003
Sweden	3.0
Finland	2.7
United States	2.4
Portugal	2.3
Germany	2.1
Austria	1.9
United Kingdom	1.8
Japan	1.5
Denmark	1.1
Ireland	1.1
Netherlands	1.1
Spain	1.1
Belgium	1.0
France	1.0
Italy	0.7
Greece	Unknown
Luxembourg	Unknown

Source: Eurostat

Doctorate holders (ISCED 6) in science/technology per 1000 of the population of 25-34 year olds in EU-15, United States and Japan

	2003
Sweden	1.5
Finland	1.1
United Kingdom	0.9
United States	0.9
Germany	0.8
Austria	0.7
Portugal	0.7
Denmark	0.6
France	0.6
Ireland	0.6
Japan	0.6
Belgium	0.5
Italy	0.4
Netherlands	0.4
Spain	0.4
Greece	Unknown
Luxembourg	Unknown

Source: Eurostat

After losing ground in the late 1990s, the number of doctoral candidates has now begun to rise. There are, however, a number of factors that distort this figure, for example the reclassification of a number of research trainees and the restructuring of the job classification system within the universities. There are also signs that fewer students are interested in pursuing a doctorate. It was already several years ago that the Royal Netherlands Academy of Arts and Sciences¹ called attention to the fact that outstanding students were much less inclined to embark on careers in research. Factors such as the salary system and the lack of career prospects greatly influence their decision. The high

percentage of foreign doctoral candidates in the Netherlands indicates that we are having difficulty recruiting students in the sciences and technical disciplines. Although this is not a recent development, the need to find a solution has become much more urgent. The Netherlands needs more knowledge workers if it is to make a successful transition to a knowledge-driven society. The global “battle for brains” also plays a role. The presence of outstanding human resources is, after all, one of the factors that knowledge-intensive companies look at when deciding where to settle².

Research training

The Netherlands has outstanding doctoral programmes. Its success can be attributed to its research schools and the system of trainee research assistants, which have an excellent international reputation. Recent studies on the quality and added value of the research schools have confirmed this. The direct link between theory and practice and the multi-university and multi-disciplinary approach are mentioned as important strengths³. But there are also points of criticism. Doctoral candidates must receive better guidance and more freedom to chart their own course. The training itself should be broader in scope. In addition, the candidates take too long to complete their doctoral studies⁴ and there are too few doctoral candidates overall. Beyond that, doctorate holders often lack various transferable skills or general competencies required to succeed in jobs outside academia⁵.

Finally, some of the criticism is levelled at the “doctoral culture”. In many cases, doctoral candidates do not get the recognition they deserve. They feel that they “don’t matter”. It is the professor who decides when a thesis is good enough, and many of them regard the doctoral thesis as the candidate’s life’s work. And when the thesis is finally almost finished, the candidate often faces a series of long and expensive procedures, partly because it is customary in the Netherlands to publish a doctorate thesis as a book.

In its position paper *Hora Est! Vernieuwing in het Nederlandse promotiestelsel*, the Association of Universities in the Netherlands voices its concern regarding the doctoral system and makes recommendations for improvement⁶. One of its recommendations is to set up graduate schools, a flexible organisation that would run the doctoral programmes. There are advantages to introducing a system of graduate schools⁷. However, it should not lead to the disappearance of successful components of the existing system. The accomplishments of the research schools must be safeguarded. Various parties, including the Advisory Council for Science and Technology Policy (AWT), have expressed their concern about the implications of introducing graduate schools for the system of research schools.⁸

Career prospects

Doctoral candidates and doctorate holders in post-doctoral positions have indicated that they regularly – sometimes even constantly – live in uncertainty as to their career prospects, both inside and outside of academia. In the academic world, they often suffer at the hands of a failing career policy and limited opportunities for promotion. Outside academia, the problem is that there is so little demand for doctorates. Part of that can be attributed to the low level of investment in R&D, but it is certainly also related to the value that society places on doctorate holders. Outside of academia, a doctorate is rarely, if ever, required as a job qualification, and it hardly ever counts as work experience, if at all⁹. All these factors mean that there is – as yet – no real labour market for doctorate holders. In the United States, for example, it is much more common to hire researchers and many more positions require the

job candidates to hold a doctorate. Their employment terms and research facilities are also often better¹⁰.

But there is another important difference between the Netherlands and other countries. In the Netherlands, research is much more likely to be performed by doctoral candidates and much less by doctorate holders in post-doctoral positions. Because doctoral candidates have less research experience than post-doctoral appointees, Dutch universities are forced to “play it safe” and avoid high-risk projects. The result is that fewer projects are truly outstanding. The limited number of post-doctoral positions also means poor career prospects¹¹.

Researchers who continue working at the university after completing their doctorate are generally given a temporary post-doctoral appointment, often followed by another temporary appointment. The problem of “stacking” one post-doctoral appointment on top of another has been around for years, but until now very little has been done about it. Although the vast majority of post-doctoral appointees are in fact pursuing careers in academia¹², most of them end up leaving the university after a series of temporary appointments¹³. On top of that, by then they are often too specialised to work in trade and industry. Generally speaking, doctoral studies do not prepare candidates adequately for life outside the university, even though that is where most of them end up.

Untapped potential

Universities and research schools have made some progress in recent years towards promoting women to more senior positions. In 2000, the number of female professors stood at only 6.3 percent. By 2004, that figure had increased to 9.3 percent (see table below). However, the Netherlands is still at the bottom of the rankings in Europe. Women are also very poorly represented in executive positions in academia. There are only four women on Dutch university executive boards (9 percent). Of the 106 university deans in the Netherlands, only seven are women, and there are only four female directors of research schools certified by the Royal Academy’s Research School Accreditation Committee (ECOS)¹⁴.

Aandeel vrouwen binnen het universitair wetenschappelijk personeel naar functiecategorie (in fte)					
	2000	2001	2002	2003	2004
Professor	6.3	7.1	8.1	8.5	9.3
Senior university lecturer	10.7	11.2	13.7	14.2	14.2
University lecturer	22.4	22.7	23.3	24.5	27.0
Other academic staff	32.8	33.9	35.3	35.3	36.2
Doctoral candidates	43.0	40.5	41.0	41.1	41.3

Source: VSNU/WOPI

Ethnic minorities are another untapped potential. A study carried out in 2002 showed that only 8 percent of the academic staff at Dutch universities can be categorised as an ethnic minority. The Netherlands’ main ethnic minority communities – Turkish, Moroccan, Surinamese and Antillean – were particularly poorly represented.

3

What are we going to do about it?

3.1. Researcher training

Graduate schools

The universities are working on introducing a new structure that they refer to as “graduate schools”. Their purpose is to improve the quality of their doctoral programmes. I have already indicated that the new structure must not be at the expense of successful components of the existing doctoral system and that the accomplishments of the research schools (including research focus and critical mass) must be safeguarded. I therefore agree wholeheartedly with the Advisory Council for Science and Technology Policy (AWT) that inter-university alliances in the research schools must not be disbanded in favour of local graduate schools. However, that does not have to prevent graduate schools from being developed. After all, various parties¹⁵ have argued in favour of a “matrix” approach or integrated model, with the local graduate school and the research schools (or parts of them) joining forces (see box). Such combinations mean we can benefit from the advantages of both.

Quality researcher training

In order to monitor the quality of the doctoral programmes, I will require the universities to submit to a periodic assessment of the organisational context of such programmes and the related research environment. This requirement will be set down in law. Such an external assessment will not replace the university’s own internal quality assurance procedures, but it will allow me to discuss the effectiveness of the doctoral programmes with the individual universities. It will also provide an overall picture of the Netherlands’ performance with respect to doctoral programmes¹⁶. In the new Higher Education and Research Act, the Royal Netherlands Academy of Arts and Sciences will be assigned the task of conducting the periodic assessments. The assessment must allow for changes in the doctoral system and give the universities the freedom to decide on the organisational context for their doctoral programmes. They may choose to set up a graduate school, but they may also wish to combine a graduate school with the inter-university research school (the “matrix” approach). Under the new Act, the doctoral programmes will also be subject to the university’s own internal quality assessment procedures. The Royal Academy’s assessment will not lead to extra bureaucratic red tape. It will replace the ECOS accreditation procedure, something that I will propose in consultation with the Royal Academy.

Graduate school models in the Netherlands

Local model I

Some graduate schools are part of a university Graduate Division. The Graduate Division is responsible for ensuring the quality of the Research Master's Programmes and for teaching and supervising doctoral candidates. The Research Master's programmes and doctoral programmes are run by graduate schools. They are responsible only for teaching students and doctoral candidates and will play no role in research policy-making or quality assurance or in any national or international collaboration in research. Research and education policy are entirely separate matters. Local responsibilities and powers are given priority. The research schools have surrendered the right to decide, within the context of their teaching and research policy, whether their own university members will participate in a national research school; that right will pass to the local entities.

Local model II

The university has a number of different graduate schools that are not covered by an overarching university structure. The Research Master's programmes and doctoral programmes are run by graduate schools. They are responsible only for teaching students and doctoral candidates and play no role in research policy-making or quality assurance or in any national or international collaboration in research. Research and education policy are entirely separate matters. Local responsibilities and powers are given priority. The research schools have surrendered the right to decide, within the context of their teaching and research policy, whether their own university members will participate in a national research school; that right will pass to the local entities.

Integrated model

The university has a number of different graduate schools that coincide with the ECOS-certified research schools. These graduate schools are not responsible for the Research Master's programmes. Such programmes are delegated to local teaching institutes, and the graduate school/research school works closely with these institutes. The graduate schools/research schools join forces at local level, with the Dean of Graduate Schools bearing overall responsibility. The graduate schools/research schools are responsible for the doctoral programmes and for developing a coherent research programme. The aim is to integrate research and teaching at doctorate level and maintain the position of the research schools (which may well become national in character) without their relinquishing any responsibilities assigned to them.

The open model

Universities are not forced to choose between any one particular graduate school model or favour emphasising local responsibilities. One and the same university is able to have all of the following: a) graduate schools responsible for both the Research Master's programme and the doctoral programme but playing no role in research policy; b) research schools that concentrate explicitly on national collaboration, integrate research and teaching policy, are only responsible for the doctoral programme and guarantee that MA and doctoral phases match up by working closely with the teaching institute responsible for the BA and MA programmes.

Quality requirements

I will consult the Royal Academy as to the quality requirements that it intends to maintain when conducting its assessments and approve the assessment criteria. The requirements should not be seen as a straightjacket of prescribed standards, but rather as an incentive to quality improvement. I will discuss the results of the Royal Academy's assessment with the management of the relevant university. The requirements will, in any event, concern those aspects that actually go to improve quality and to ensure that the strengths of the research schools are preserved:

- ⋮ doctoral degrees of an internationally comparable level
- ⋮ critical mass within disciplines, which may well require collaboration on a national level
- ⋮ relationship with research and the (research) Master's
- ⋮ recruitment and selection of doctoral candidates based on their suitability, without barring the way for doctoral candidates from other universities
- ⋮ research environment (scope and quality of research and researchers)
- ⋮ supervision
- ⋮ concern for training in interdisciplinary and transferable skills¹⁷ (this can go beyond traditional teaching methods to include, for example, peer-sharing groups)
- ⋮ career development / labour market
- ⋮ performance and duration of doctoral programmes
- ⋮ tailor-made programmes, for example those that train students for careers outside academia.

Finally, the assessment should concern the most suitable organisational context for the doctoral programme: should it be national or local?

Better information

In order to determine the effectiveness of the system and the related policy, it is important to have better statistical and qualitative information at national level in addition to the doctoral programme assessments conducted on a university-by-university basis. Such information should at the very least cover the number of doctoral candidates in each type of doctoral programme (dual, external *doctoral candidate*) and such aspects as performance, duration and career. After consultation, I will assign the responsibility for collecting and managing this information to the Association of Universities in the Netherlands or the Royal Netherlands Academy of Arts and Sciences.

Such information will be used for various purposes, for example to understand how academic careers develop and how many people enter, make their careers in or leave the academic world. There are, as yet, no statistics on these subjects. I will take up this topic with the Association of Universities in the Netherlands within the context of existing information agreements, and with the Netherlands Organisation for Scientific Research and the Royal Netherlands Academy of Arts and Sciences within the context of information exchange agreements. In order to monitor the progress towards a more diversified academic workforce more closely, it will also be necessary for the aforementioned statistics to be broken down into gender and ethnic background. That will make it possible to pinpoint instruments intended to improve the position of women and ethnic minorities in academia. Developing more closely defined indicators also makes it easier to join in European monitoring systems/benchmarks. Finally, setting up an annual labour market monitor for doctorates will provide a better understanding of the sectors in which they work. At the moment, we do not really have a good idea of what doctoral candidates do after receiving their degree. Such efforts

correspond with the OECD, EU and UNESCO initiative to develop harmonised questionnaires concerning the careers of doctoral candidates.

Financial resources

One-off amounts have been set aside in the Ministry's budget for reforming the doctoral programmes. A sum of € 4m has been made available for 2005 and € 3m for 2006. The monies will be distributed between the universities in proportion to the number of doctoral candidates conferred at each one. The universities, in turn, must have drawn up a plan to reform their doctoral programmes. They may only use the financing to improve the quality aspects referred to above.

3.2. More diversity in doctoral programmes

We can make doctoral programmes more appealing to more students by introducing more diversity in the types of programme. This is one of the recommendations of the Advisory Council for Science and Technology Policy². In addition to those focusing mainly on a career in academia, programmes can also be envisaged that concentrate on non-academic careers. For example:

- ⋮ Dual doctorates
- ⋮ Sandwich doctorates (alternating between doctoral research work and a job in the field)
- ⋮ Doctorates conferred on teachers at institutions of professional education (see the performance agenda set by the Ministry and the Netherlands Association of Universities of Professional Education)
- ⋮ External doctorates (e.g. at Philips).

By the latter example, the Council is referring to people who pursue a doctorate within their company or non-university teaching or research organisation or in a less research-driven work environment such as elderly care, senior secondary vocational education, law or regional government.

I am in favour of having a greater variety of doctoral programmes. Programmes that train students for the broader labour market may place less emphasis on factors that are important in academic careers and more emphasis on those that matter outside academia. One important proviso is that these programmes are developed in an organisational context that is assessed by the Royal Academy. The various policy information channels (see above) will allow the Ministry to keep a close eye on developments. Consideration must be given to how we can best encourage more variety in doctoral programmes.

The Association of Universities in the Netherlands¹⁸ and the Advisory Council for Science and Technology Policy also propose developing shorter research programmes that are not concluded with a thesis. I am not convinced that such shorter programmes are useful or necessary, leaving aside the existing programmes for designers. Third-cycle programmes that do not match the quality requirements of mainstream doctoral programmes would not be transparent from the point of view of international comparison.

More variety in doctoral programmes: Philips' Van der Pol Programme

In its efforts to encourage innovation and improve knowledge transfer with Dutch and other universities, Philips has set up its "Van der Pol Programme", which focuses on training a "new" type of researcher who feels at home at the interface between business and pure research. The programme offers talented students and researchers who would like to gain research experience in industry the opportunity to conduct doctoral research at Philips Research in one of its national or international research programmes. Researchers (doctoral candidates, post-doctoral appointees and even Research Master's students) who have a Van der Pol appointment receive a fixed-term contract with Philips (which may be co-financed via NWO's Casimir Programme or the EU's Marie Curie Fellowships) and work on the High Tech Campus.

Source: Philips Research

3.3. More freedom and greater leeway for talented researchers

To give talented young researchers greater freedom in their doctoral studies, I have set aside a budget for the 2007-2010 period to finance 25 personal grants a year, to be awarded to promising graduates who wish to pursue a doctorate on the subject of their choice. The Netherlands Organisation for Scientific Research (NWO) will assess the talent of the competing candidates and the quality of their research proposals. The candidates will then be at liberty to make arrangements with a suitable university research group. I will ask NWO to work up a proposal to this effect. The scheme will be evaluated in 2009 and a decision on whether it is to continue will be taken the following year.

In order to also give talented researchers with innovative ideas greater freedom after they obtain their degrees, the Ministry has set up the Innovational Research Incentives Scheme (*Vernieuwingsimpuls*). The scheme has been successful; it was recently evaluated and will be continued¹⁹. The evaluation led to tensions between NWO and the universities concerning the institutional guarantee in the "Vidi" grant round. The Spinoza Club, the society of Spinoza prize-winners, published an opinion paper on the subject²⁰. I have adopted its advice and asked NWO to drop the institutional guarantee that is required upon submission of Vidi proposals and to request it only after the grant has been awarded.

Experience shows that a certain group of researchers (those who are on the verge of completing their doctorate) are not eligible for the scheme, leading to a gap in funding after they have received their degree. To bridge that time gap and keep talented young researchers working in academia, I have made € 4m available in the 2005 budget for the Rubicon Programme²¹. This programme gives promising young researchers an opportunity to gain experience after completing their doctorate by working at a foreign research institution (for no more than two years) or a Dutch institution (one year). The programme will be continued for a further five years after 2005, subject to an interim evaluation in 2007. After five years, its continuation will be reconsidered.

The position paper *Hora Est!* favours having more different types of appointment, so that doctoral candidates have greater freedom to pursue their own interests within their programmes. The introduction of "student status" for doctoral candidates will, however,

have particular implications for Dutch doctoral candidates, as foreign doctoral candidates already make up the majority of *beurspromovendi*, i.e. doctoral candidates who are not given a university appointment as a research assistant but are considered scholarship students. There is too great a risk that Dutch students will find pursuing a doctorate even less appealing than they do now, and that our doctoral programmes will have to depend even more than at present on recruitment from abroad. In addition, having different types of appointment alongside one another would be too confusing for Dutch doctoral candidates. Another argument is that much of the research performed in the Netherlands is carried out by doctoral students, who prepare for this work during their Master's programme. They therefore make a contribution to the production of knowledge in the Netherlands, and consequently deserve to be categorised as employees. Doctoral candidates' salaries have, furthermore, recently been increased in order to make the programmes more appealing.

3.4. Better career prospects for talented young researchers

In order to ensure that young researchers have opportunities for promotion and to make careers in academia more attractive, universities and research schools must focus on the personal qualities of their researchers. This implies that they should select candidates on the basis of motivation and talent, and not because there happen to be vacancies on staff or because of a personal relationship. Those with talent should have the opportunity to take the next step in their careers. Building in selection points also makes things clearer for young researchers, who will have a better idea of where they stand and whether they have a chance of being promoted. More and more universities have been following the career track principle and are introducing the tenure track system on a modest scale. I applaud these initiatives. The career track principle should, however, be introduced in tandem with a system of sound career counselling, one that includes performance and development agreements. The Innovational Research Incentives Scheme and the Rubicon Programme are compatible with the idea of career development.

Since the majority of doctoral candidates do not continue working in academia, the career counselling system should focus on careers both inside and outside the universities. The employability of doctorate holders must be increased so that they are prepared for work in a much broader labour market. Young researchers should therefore be given the opportunity to develop skills that are in demand in fields outside of academia, for example in the business world²². This would include their gaining experience elsewhere, for example through foreign exchange programmes or in another research environment (for example in industry). This is one of the aspects that the Royal Academy will be taking as a criterion when assessing the doctoral programmes. The Casimir Programme, which encourages mobility between sectors, offers researchers the opportunity to acquire experience in a different working environment and to develop a broader range of skills (see also p. 13).

The institutions have an important responsibility in this respect. I therefore intend to enter into discussions with the universities, the Netherlands Organisation for Applied Scientific Research (TNO), the Royal Academy and NWO concerning opportunities and career prospects for talented young researchers and the associated personnel policy and career counselling system. I will ask them to set targets in this respect in their strategic plans. In addition to the aforementioned aspects, I will also be looking with the universities at

the composition of their academic staff, in particular the fact that the number of doctoral candidates far outweighs the number of post-doctoral appointments. I will ask the institutions to pay explicit attention to this group as they develop their tenure track systems. It is their responsibility to see that their personnel policy holds out promising career prospects for talented young researchers. I will therefore discuss the development of tenure track systems with them as part of our policy dialogue. One problem is that the system is much cheaper and more flexible when it is based on having a lot of young researchers on temporary appointment and with limited career prospects. That is what makes it so appealing to the institutions, who are anxious to attract indirect funding and contract funding. To ensure that the financial incentives in both cases are more in balance, we will explore whether university funding can be made contingent, at least in part, on the extent to which universities actually push doctoral candidates through into careers in privately or publicly funded research and/or into another socially relevant position.

Good practice case: FOM

The Foundation for Fundamental Research on Matter (FOM) is well known for its sound personnel policy. FOM believes that its doctoral candidates are its most important “product”. “We see doctoral candidates as a benefit, not a cost,” emphasises Hans Chang, FOM’s director. Doctoral candidates at FOM are appointed for a four-year period as junior researchers, during which time they can produce their thesis. In those four years, FOM tries to equip the junior researchers with as many skills and as much knowledge as possible. Every junior researcher is obliged to draw up a teaching and supervision plan with his or her supervisor. The plan not only covers the research he or she will be performing, but also the knowledge and skills he or she intends to acquire and what the supervision will consist of. Every junior researcher also takes training courses, some of which are compulsory. The courses focus on developing the personal skills (including presentation techniques) that they will need to be good researchers, on their careers after completing their degree (an orientation of the labour market and how to apply for appointments), and on management aspects. FOM doctorates do very well in the job market. A survey conducted among them revealed that almost three quarters of the respondents had found a job either before completing their doctorate or immediately thereafter. The survey also showed that FOM doctorates have a wide range of different skills: half the respondents work in the public sector and half in the private sector. (Source: A. van Stel and A. Zegers, *Complexe problemen en een terrasje in San Francisco, FOM, 2003; interview with Hans Chang, July 2005*)

The European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers were developed to help the EU Member States, employers, research financing bodies and researchers develop an appealing, open and sustainable European labour market for researchers. They ensure that selection and recruitment procedures are transparent and internationally comparable. I see the Charter and Code of Conduct as providing a good basis for improving the career prospects of researchers. The Charter and Code of Conduct must, however, be introduced and endorsed at the right level. I will draw the attention of the relevant parties to these documents and ask them how they intend to implement them. Trade and industry will also be involved in this dialogue, as the Charter and Code of Conduct also apply to companies as the employers of research staff. I will furthermore enter into similar discussions with the private sector.

3.5. More concern for untapped potential

More must be done to create opportunities for untapped potential (women and ethnic minorities). Gender and ethnic diversity among academic staff will generate creative ideas and is therefore vital to the quality of research. That is why hiring and promotion procedures should encourage ethnic minorities and the advancement of women to senior positions. Such policy should ease the way for women researchers who are returning to the workforce after a long period of leave (to care for children) or a career break.

The revised Aspasia Programme has been launched. This year, fifteen Aspasia grants will be awarded to university executive boards that have promoted female candidates proposed by NWO to the rank of senior university lecturer or professor. This number will be raised to 20 a year starting in 2006 and the programme will be evaluated in 2008. If the revised programme turns out to be successful, long-term funding will be set aside starting in 2009. In addition, my policy discussions with the institutions will cover performance agreements aimed at reducing the under-representation of women in senior academic and executive positions. As a target for female professors has recently been set at European level (25 percent)²³, I will ask the institutions to determine their own target percentages with this in mind. With a rise of almost 50 percent having been achieved between 2000 and 2004 (see table on p. 5), the Aspasia Programme and the universities' own efforts should make it possible to increase the percentage of female professors to at least 15 percent by 2010 (as an average). To explore whether a gender bias may exist in the selection mechanisms for senior university positions, we have financed a study of these mechanisms. The results will be announced in 2006.

I will ask the universities and research organisations to make gender and ethnic diversity an integral part of their regular personnel and career policy. In consultation with them, I will look for ways to acquaint ethnic minority students with the possibility of a career in academia, for example by offering them tailor-made information or by establishing a system of mentorships. The Mosaic Programme will be continued. An annual sum of € 2m is available for 2005 and 2006; NWO is matching this amount. A decision will be taken in 2006 as to whether to continue the Mosaic Programme.

3.6. Mobility

Research is an international field. The transition to a knowledge-intensive society has increased the level of competition for talented researchers and scientists across the globe. It is therefore vital that we work hard to make the Netherlands a more attractive and welcoming place for talented foreign researchers. Doing so is also the key to making the Netherlands a preferred country for setting up business operations. Experience abroad is often one of the requirements for a career in research, and it also contributes to the quality of research. For all these reasons, it is important for us to create a favourable climate for mobility, both geographical and between sectors. The European Union is making a tremendous effort in this direction (for example the Marie Curie Actions and the European Researcher's Mobility Portal). Mobility policy should also consider the return and reintegration of Dutch researchers who have spent time working abroad. I see this as one of the universities' key tasks.

The Rubicon Programme (see above) was set up to enable young researchers to gain relevant work experience abroad. In addition, cooperation agreements in the field of science, technology and innovation have recently been made with Flanders (Belgium) and North Rhine-Westphalia (Germany). Within this context, the regional mobility of knowledge workers will also be encouraged within the Eindhoven (NL) – Aachen (D) – Leuven (B) triangle. A joint task force has been set up to implement these agreements.

To encourage knowledge transfer and allow researchers to gain experience working in a sector other than their own, the Innovation Platform²⁴ has proposed developing a programme for inter-sector researcher mobility. NWO launched the Casimir Programme this year, which is seen as a robust facility with growth potential. The programme will focus on stimulating mobility by arranging exchanges between researchers working in industry and researchers working for publicly funded institutions. Such exchanges will make a job in research more appealing and multifaceted, and increase the labour market opportunities for researchers. A sum of € 3m has been made available for 2005 from the Delta Plan Science & Technology. A decision will be taken on next year's budget this autumn.

Opening the Netherlands to knowledge workers

In November 2003, the Innovation Platform presented its advisory report *Grenzeloze Mobiliteit Kennismigranten: Hoe krijgen we het talent naar Nederland toe?* (Borderless Mobility for Knowledge Migrants: How can we get talent to come to the Netherlands?). In response, the Cabinet adopted a set of measures last year to simplify the immigration procedures for knowledge workers and their partners from outside the EU/EEA. The new fast-track procedure was introduced on 1 October 2004. Knowledge migrants now deal with only one government authority, go through a uniform procedure and are issued the same type of permit. By May 2005, the Netherlands' Immigration and Naturalisation Service (IND) had already granted 400 knowledge migrants permission to work in the Netherlands²⁵. The measures may still need to be tightened up and amended, however. The Ministry has therefore set up a working party with other relevant ministries, the Immigration and Naturalisation Service (IND), the Association of Universities in the Netherlands (VSNU), the Netherlands Association of Universities of Professional Education (HBO-raad) and the Federation of Institutes for International Education in the Netherlands (FION). This group is preparing further specific steps that will optimise the measures taken to date. Its main focus is on the admission of students. Although not covered under the fast-track knowledge migrant procedure, they do represent a pool from which top researchers can be drawn in the future.

As announced in the policy letter on the internationalisation of higher education in the Netherlands, the universities will receive a sum of € 20m between them from 2006 to 2008 which is intended to help them attract the best students from outside the EU. In addition, starting in 2006 Huygens Scholarships will be awarded to Bachelor's, Master's and, specifically, doctoral candidates from the four EU candidate countries Turkey, Romania, Bulgaria and Croatia²⁶.

The European Union is also working to relax entry restrictions for researchers from third countries. The European Commission adopted a proposal for a Directive and two Recommendations in March 2003. The purpose of the Directive is to relax and harmonise the procedures for admitting third-country nationals for purposes of scientific research. The two Recommendations are intended to facilitate their admission by fast-tracking residence

permit and visa procedures. The Council adopted the Directive in late 2004 and it is now being considered by the European Parliament. As soon as Parliament has issued its advice, the Member States must transpose the Directive within two years.

Within the context of Europe's mobility strategy, the Member States, in coordination with the European Commission, will take stock of impediments to researcher mobility in such areas as social insurance entitlements, pensions and tax-related matters. The Commission has asked the Member States to identify best practices in this respect.

The European Framework Programme for Research and Development

In April 2005, the European Commission published its proposal for the Seventh Framework Programme for Research and Development. The Commission proposes setting up a specific programme, "People", which would include the Marie Curie Actions to encourage mobility and support the initial training and career development of researchers. My consultations with representatives of the research community have made it clear that there is ample opportunity for the Netherlands to participate in the Marie Curie Actions. The Minister of Economic Affairs and I both anticipate that the Netherlands has a good chance of succeeding in the Seventh Framework Programme on this point. I have asked the EG-Liaison, our national contact point for the Framework Programme, to be as proactive as possible in order to maximise the Netherlands' opportunities for success. The universities and other research organisations can also play a role by drawing the attention of researchers and faculties to the Marie Curie Actions. I will therefore be discussing this point with the institutions.

The Commission also intends to "externalise" various activities under its supervision. An executive agency will be charged with managing the Marie Curie Actions. I will press for speedy consultations with the international and national organisations that play a role in implementing the Marie Curie Actions. It is vital that their involvement does not lead to higher costs or fewer individual grants, and that the quality of the Marie Curie Fellows are of a guaranteed comparable level.

4

Final comments

In addition to summarising the main policies and actions described in this memorandum, this section provides a financial summary for the measures referred to above.

Quality of the doctoral programmes

- ⌘ The Royal Netherlands Academy of Arts and Sciences will carry out a periodic assessment of the organisational context of doctoral programmes and the related research environment. The assessment will be provided for in the new Higher Education and Research Act.
- ⌘ A total of € 7m will be made available in 2005 and 2006 to finance projects intended to improve the quality of doctoral programmes.

Better information

- ⌘ One of the topics to be raised within the context of the agreements on quantitative data with the Association of Universities in the Netherlands (VSNU), the Netherlands Organisation for Scientific Research (NWO) and the Royal Netherlands Academy of Arts and Sciences will be how best to improve data collection and increase the amount of data collected. The VSNU or the Royal Academy will collect and manage this data. Another topic is the proposal to set up an annual labour market monitor of doctorates.
- ⌘ A particular point of concern will be to make data available that allows us to monitor progress towards gender equality and the participation of talented ethnic minority researchers.

Giving talented researchers more freedom

- ⌘ The sum of € 16m has been set aside to give talented young researchers more freedom to design their own doctoral training. Between 2007 and 2010, this will make it possible for 25 promising graduates a year to pursue a doctorate on the subject of their choice. A decision will be taken in 2010 as to whether to continue the funding.
- ⌘ To give those who have just received their doctorate a chance to gain experience before applying for a grant under the Innovational Research Incentives Scheme, NWO has set up the Rubicon Programme. A total of € 4m per year has been set aside up to 2010.
- ⌘ The institutional guarantees required prior to submission in the Vidi grant rounds will be eliminated. The guarantee will be required only after the candidates have been selected by NWO.

Untapped potential

- ⌘ Gender and ethnic diversity must be made an integral part of the universities' personnel and career policies.

- ⌘ In policy discussions with the institutions, performance agreements will be made aimed at increasing the number of women in senior academic and executive positions.
- ⌘ These discussions will also consider how best to acquaint ethnic minority students with the possibility of a career in academia.
- ⌘ The revised Aspasia Programme was launched this year.
- ⌘ A decision will be taken in 2006 as to whether to continue the Mosaic Programme.

Career policy

- ⌘ Programmes such as Rubicon and Casimir will be employed to prepare researchers more thoroughly for careers in research or in other sectors.
- ⌘ Discussions will be held concerning the best way to increase opportunities and career prospects for talented researchers and the most appropriate personnel policy and career counselling system (for example tenure tracks). The “post-doctoral appointments” problem will be given special attention. The universities will define targets in their strategic plans.
- ⌘ Consideration will be given to making public funding contingent, at least in part, on the extent to which universities actually push doctoral candidates through into careers in research.
- ⌘ Discussions will be held with the business community as an employer of doctorates.
- ⌘ The European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers will be brought to the attention of relevant parties, including teaching and research organisations and the business community.

Mobility

- ⌘ Both geographical and inter-sector mobility will be encouraged, for example through the Rubicon and Casimir Programmes.
- ⌘ The Netherlands will explore opportunities to encourage the regional mobility of knowledge workers with Flanders and North Rhine-Westphalia.
- ⌘ The fast-track procedure for knowledge migrants will be tightened up and amended. The focus will be on the admission of students.
- ⌘ The universities will be encouraged to promote the participation of Dutch researchers in the Marie Curie Actions under the Seventh European Framework Programme. The Dutch national contact point, EG-Liaison, will play a proactive role in this respect.

Summary of funding to encourage talented researchers

	2005	2006	2007	2008	2009	2010
Innovational Research Incentives Scheme ¹	26.4	25.6	25.6	25.6	25.6	25.6
Women in the Innovational Research Incentives Scheme						
Aspasia	1.5	2	2	2	2	2
Mosaic	2	2				
Casimir	3					
Rubicon	4	4	4	4	4	4
Creative doctoral candidates			4	4	4	4
Reform of doctoral programmes	4	3				

¹ Total OCW and FES-BSIK financing. For 2005, contribution by LNV as well.

Endnotes

- 1 Royal Academy, *Rijzende sterren. Om de kwaliteit van de onderzoekersopleiding*, 2000
- 2 See also the AWT advisory letter on research careers (*Onderzoekslaanbanen*), 15 July 2005.
- 3 Hans Sonneveld and Heinze Oost, "Buitenlandse beoordelaars over de kwaliteit en meerwaarde van de Nederlandse onderzoekscholen. Een analyse van Peer Review Committee rapporten." Second Progress Report, February 2005. *Beleidsgerichte studies Hoger Onderwijs en Wetenschappelijk onderzoek*, no. 112
- 4 See, for example, *Rendement verkend, succes en faalfactoren van promotietrajecten aan Nederlandse universiteiten*, EIM, August 2005 and Hans Sonneveld and Heinze Oost, "Buitenlandse beoordelaars over de kwaliteit en meerwaarde van de Nederlandse onderzoekscholen. Een analyse van Peer Review Committee rapporten." Second Progress Report, February 2005. *Beleidsgerichte studies Hoger Onderwijs en Wetenschappelijk onderzoek*, no. 112
- 5 Nicolet Jansen, *Jonge Wetenschappers: competent talent?! De rol van competenties en de werkomgeving voor een succesvolle loopbaan*, VSNU, 2002
- 6 *Hora Est! Vernieuwing van het Nederlandse promotiestelsel*, VSNU, October 2004
- 7 Some important advantages of the university graduate school system are the transparent responsibility (including in the financial sense) for the doctoral programme, better opportunities to align university Master's and doctoral programmes, more options to create an inspiring (physical) environment, more possibilities of transferable skills, more opportunity to structure different types of doctoral programmes for candidates who are already in work or wish to pursue their doctorate within the context of their job.
- 8 See AWT (footnote 2), *Onderzoekers Optimaal Opgeleid*, Royal Academy's advisory report on researcher training programmes, August 2005 and a contribution by the Spinoza laureates.
- 9 See AWT (footnote 2), Nicolet Jansen, *Jonge Wetenschappers: competent talent?! De rol van competenties en de werkomgeving voor een succesvolle loopbaan*, VSNU, 2002, *Intermediair PhD Orientation Guide 2005* and "Een promotie is niet te vergelijken met werkervaring" in: *Technisch Weekblad 27 May 2005* and contribution by VAWO.
- 10 Contribution by VAWO and EU, *Third European Report on S&T Indicators*, 2003
- 11 Contribution by the members of the Young Academy
- 12 For 85% of the post-doctoral appointments, being able to perform research was one of the two most important reasons for accepting an appointment. Source: Suzanne Broersen, *Werken in de wetenschap. De loopbaanpositie van postdocs. Een onderzoek in opdracht van de stichting SoFoKles*, 2003.
- 13 Approximately a third ultimately move on to a mainstream academic position. Source: *Wetenschap tussen roeping en beroep*. 2001 (NB: up-to-date figures are not available)
- 14 Poster *Hoeveel vrouwen besturen nu?*, Equal Project "Doorbreking Genderkloof Universiteiten", March 2005
- 15 Including the contribution by PNN and the Spinoza laureates.
- 16 This is also an argument put forward by various parties, see the contributions by the Spinoza laureates and the Royal Academy
- 17 Not related to the researcher's discipline
- 18 VSNU press release, *Universiteiten omarmen het professional doctorate*, June 2005
- 19 The evaluation report appeared in August 2003
- 20 See letter to the Lower House of Parliament, 16 June 2005, no. OWB/AI/2005/20637
- 21 Following the Visser Amendment to the budget for 2005 (Lower House of Parliament, 2004-2005, 29 800 VIII, no. 166)
- 22 The competencies involve such things as leadership and organising, creativity and decision-making, taking the initiative and being persuasive, and developing professionalism and resilience. See also: Nicolet Jansen, *Jonge wetenschappers: competent talent?! De rol van competenties en de werkomgeving voor een succesvolle loopbaan*, VSNU, 2002
- 23 Conclusions of the Competitiveness Council, 18 April 2005
- 24 The Innovation Platform started its activities in September 2003 and has been installed – by Royal Decree – until 1 July 2007. Chaired by Prime Minister Balkenende, the Innovation Platform aims to strengthen the innovative potential of the Netherlands in order to secure a leading role for this country in the European knowledge economy of 2010.
- 25 See Ministry of Justice press release of 4 May 2005
- 26 See *Koers op kwaliteit, Internationaliseringsbrief Hoger onderwijs*, November 2004 and the letter sent to the Lower House of Parliament on 13 June 2005, no. HO/BL/2005/25078

