

Effect of Research Masters

A study of the effects Research Masters have on the enrolment in Ph.D-programmes in some West-European countries

1 Introduction

Since the sixties, West-European countries have developed more and more towards an economy that is predominantly aimed at the production of knowledge-intensive services. This economy is also known as the knowledge economy. The important contribution made by research, and specifically scientific research¹, is acknowledged everywhere². Scientific research is a substantial factor for the innovative force of a country and its economical progress. Taking into account the competitive relations with other knowledge economies, it is therefore important for national governments to take measures to stimulate scientific research in amount as well as in quality.

The Ph. D. seen by many as the highest academic degree³, can delight in growing attention in the debate on the knowledge economy. The specific attention for the Ph.D. is of different kinds and varies from increasing the amount of researchers, the structural imbedding and form and content of the research programme, governmental influence and accreditation to fallout and output of doctor's degrees. Having been an exclusively academic affair for a long time, the Ph. D. now conjures a larger interest from national and supranational governments. For example, the European committee of ministers for education are considering including the Ph. D. stage in the Bologna process. This means that the two-cycle educational model of bachelor (1st cycle) and master (2nd cycle) will become a three-cycle model with the addition of the Ph. D. (3rd cycle). The European ambitions of the European Research Area (ERA) and the European Higher Education Area (EHEA) converge in the research training.

Entrance to the Ph. D. stage may differ according to country. In some European states a scientific bachelor will suffice whereas in other states a completed academic master is required. In some countries, a trend has arisen that universities develop special masters as a stepping stone to profound scientific research, as opposed to the other academic masters. These universities adhere to the thought that these special masters shape the research programme more profoundly and prepare the students more efficiently for a further scientific research career; eventually leading to a Ph. D. and the degree *Doctor of Philosophy* for many students. These special research-oriented masters are known as the *Research Master* or by the degree *Master of Philosophy*. The effects of these masters on the enrolment in Ph.D.-programmes are the subject of our research.

1 Scientific research is often depicted as the most important human source of knowledge that is considered more objective, more free of values, and more independent compared to other forms of knowledge (intuition, oral tradition, religious inspiration) (Rutgers). This scientific knowledge is acquired because it is realized according to certain standards, methods and techniques which constitute scientific research.

2 See amongst others CBS, Twee pijlers van de kenniseconomie, 2002; and CPB, Higher Education Reform: Getting the Incentives Right, 2001.

3 In England however, the Ph. D. is not seen as the highest degree, but as the highest form of education. There, the Higher Doctorate is the highest academic degree and is obtained by those who have given an exceptional, original and important contribution to science. In this case, the degrees would be DLitt, DSc, DD and Ding. See also the thesis of Hans van Hout, Onderzoekers in opleiding, een verklaringsmodel voor problemen van promotie-assistenten in opleiding, IOWO, Nijmegen 1988.

First, a look will be taken at the changes happening in the field of research education. Next, we will look at the European countries in which the Research Master is chosen in the organization of the research programme. I will also describe some dimensions of the Research Master, based on the experiences in seven European countries. Subsequently, the aims and thesis of this research will be described and, finally, I propose an approach to this problem.

2. Research education and the Research Masters

To fulfil the European ambition of being the most dynamic and competitive knowledge economy in the world by 2010, an agreement has been made that the members will reserve 3% of their GNP for research and experimental development⁴. The demand for researchers will increase considerably through this investment. According to estimates made by the European Commission, 1.2 million extra jobs should be created in the research field, of which 700.000 will be for researchers. The replacement demand for researchers at universities, where, because of the imminent aging of the population, more than 30 percent needs to be replaced in the coming years, has not been included in this number of 700.000. The education of researchers will increase in the coming years to quickly deliver good and well-equipped young researchers, and with it the pressure on national governments and universities, who are after all, the best suppliers of academically trained researchers.⁵

This leads to discussions about how to organize the research programme as efficiently as possible, so that the great demand for researchers can be met without loss to the final qualifications of the researchers. The *Research Master* is an example of a different organization. The reasons for introducing the *Research Master* can differ per country. Apart from quantitative reasons such as growth and new talent, the increasing *massification* of students in European higher education and the resultant differentiation of educations have been an important reason to restructure the research programme. The necessity of decreasing the drop out of people taking the doctor's degree and improving the output of the Ph.D. play a part as well.

For the last fifty years the participation of students in higher education has increased fivefold in Europe. Where in the fifties five percent of the students in an age group had access to higher education, it has now become twenty-five percent or more. The results of the massive enrolment are far-reaching. The student population has become not only bigger, but more heterogeneous as well, because of different age, social background etc. This has caused the methods of education that were mostly based on research-related and mainly individual guidance to be replaced by more formalised arrangements. More *differentiation* has developed in the second stage of the system to safeguard the quality of especially the entry into the highest degree in higher education, as a result of the decreased selectiveness in entering the first stage of higher education.⁶ *Research Masters* are an exponent of this increasing differentiation. The goal of these masters is to prepare promising students as well as possible for a Ph. D. degree or a career in research outside the academic environment.

4 European Commission, Researchers in the European Area: One profession, Multiple Careers. COM(2003) 436 final.

5 Trend IV report of the European University Association

6 Enders, J., Research training and careers in transition: a European perspective on the many faces of the Ph.D, Studies in Continuing Education, Vol. 26, No. 3, November 2004.

Another important reason for introducing the *Research Masters* is increasing the output of the doctor's degrees and decreasing the fallout of Ph. D. students.⁷ Fallout and delay of many Ph. D. students is a continuing worry in many countries. The research master tries to shape the research programme in such a way that students will not only be better prepared for the Ph. D. degree through research skills and techniques, but that they will get a taste of the profession of researcher as well. Some may decide that a career in research is not for them, thus decreasing fallout. Those that effectively continue to the Ph. D. are better equipped methodically, so that they can make better use of their time during their Ph. D. Finally, some countries see the *Research Master* as a means to stimulate the profession of researcher. In this way, students might be tempted to pursue a scientific career, also because of the growing need for scientific researchers in this knowledge economy.

The choice for a *Research Master* in organizing the researchers programme thus differs per country. In the Anglo-Saxon countries where the Bachelor/Master system has been the basic structure for higher education of old, the *Research Master* has existed for quite some time. The *Master of Philosophy* (M.Phil) that has been linked to the *Research Master* is an established master's degree for more research oriented masters. Even though the criteria for awarding the degree can differ between the U.K. and the U.S., the M.Phil is a research programme that finds its place between the MA/MSc and the Ph.D. as far as research is concerned. The *Research Master* and the accompanying degree *Master of Philosophy* exist in varying forms in the countries that have introduced the Bachelor/Master system after the declaration of Bologna in 1999. By signing this declaration and implementing the Bachelor/Master system these countries were and are obliged to grant new (academic) degrees to new programmes. The research programme needs to be reorganised or introduced as well. Some countries like France or the Netherlands introduced specific research programmes (*Master de Research / Onderzoeksmaster*) whose curricula had to satisfy the nationally established standards of quality. Other countries like Germany, Flanders and Austria do not (yet) know this distinction between specific masters as opposed to other academic masters. The M.Phil does turn up incidentally on an institutional level.

The Research Masters and the M.Phil will be described in short below. This is done by describing three clusters of two or three countries with some similarities. The first cluster is the United Kingdom and the United States because here the Research Master and the degree of M.Phil have been well established. The second cluster consists of France and the Netherlands while these countries have proceeded to the BA-MA system in 1999 and both have a strong link between the Research Master and the research groups. The final cluster contains Germany, Austria and Flanders because no distinction is made between the MA-MSc and the M.Phil in these countries⁸.

The United Kingdom and the United States

The Research Master with the accompanying degree 'Master of Philosophy' exists in both the United Kingdom and the United States. In the U.K. a distinction is made between Taught Masters and Research Masters where it concerns academic masters. The huge difference between these programmes is that the research component must

⁷ EU science indicators 2003.

⁸ For example, the Maximilian University of Munich has the degree of Magister Philosophiae

be weighed more in the Research Master for the Research Master student, including the production of a written test of proficiency. Within the British system, the Research Master is a degree which is more important than the MA, especially when used as a stepping stone to the Ph.D. The M.Phil may also be awarded when the examination board judges the thesis to be sufficient for allowing entry to the Ph.D (Philps & Pugh, 1987).

In the American system the M.Phil is sometimes used to denote someone who has already satisfied the conditions that precede writing a dissertation for the Ph.D, but can also be used as a specific form of the 'Master's degree'. In the United States the 'Master's degree' is uncharted territory. 'It can be a reevaluation of the four year 'undergraduate' programme, which is often required for a teacher certification as 'high school' teacher. However, it can also be an extra step en route to the Ph.D or a way out for those for whom the Ph.D is too much⁹. The aims of the M.Phil are primarily concerned with the fact that the Ph.D has such a high level of fallout and such a low level of output in the doctor's degrees. For example, Yale University has always been a great advocate of the Research Masters.

France and the Netherlands

Until recently, France had a three-stage system in the pre-doctorate programme. The first stage was the *License* and took three years. This was followed by the one-year *Maîtrise*, which was then followed by the one-year master. This system is also known as the y-system. After the master it was possible to start the Doctorat, which took another two to four years of scientific research and was concluded with the defence of a dissertation. Meanwhile, France has also introduced the BaMa system, though under the name of LMD (License, Master, Doctorat) system. The License is awarded after three years, the Master after another two years, followed by the Doctorat of two to four years of scientific research and the defence of a dissertation. One could say France has gone from a Y to a T-system. One of the most important adjustments in the T-system as opposed to the Y-system and the incorporation of the *Maîtrise* in the Master stage is the difference between professional masters and research-oriented masters, the so-called *Masters de Research*. The introduction of these has the following characteristics. They are two-year master programmes linked to research programmes. The programmes are selected by the central government, the ministry of education. At the moment some fifty programmes have been marked as *Masters de Research*. The introduction of the two-year master-concept has been implemented throughout the French system of higher education; the universities and the *grandes écoles*. For the first time this has happened collectively¹⁰.

The introduction of the bachelor/master system in the Netherlands has given rise to research into and recommendations for the variety and length of the scientific masters in the Netherlands¹¹. Three kinds of scientific masters can be distinguished: the profession-oriented master, the domain master and the research master¹². The profession-oriented master relates to the need from the society for professionals with clear,

9 Van Hout, J.F.M.J., *Onderzoekers in Opleiding, een verklaringmodel voor problemen van promotie-assistenten en assistenten in opleiding*, IOWO 1988, Nijmegen.

10 Monteil, J.M., *National Report France 2004-2005, under the Bologna Process*. See: http://www.bologna-bergen2005.no/Docs/France/National_Reports-France_050125-Fr.PDF

11 By order of the VSNU (2001) the Cohen committee has given thought to the length of scientific masters. The Topmaster committee (2002) researched differentiation in the scientific masters offered, by order of the state secretary for Education, Culture and Science. Both committees indexed the offered scientific masters. Such an index can be useful in determining the placher of the research master among the other offered scientific masters.

12 Wende, van der, M. en Huisman, J., *THEMA 2*, 2003

application-oriented, academic background, like doctors, notaries and teachers. The domain master can be a disciplinary or a multi-disciplinary programme that meets the demands for academics who are schooled in a specific domain or with a specific direction, as for example within the studies of Law and Economics. The domain master is not exactly profession-oriented, nor is it specifically research-oriented. The research master, finally, is a masters programme preparing students for a career in scientific research, both within and outside of the university, as for example on the research section of profit and non-profit organizations that require a solid scientific education. The entrance to the Ph.D is also available for students with another scientific master's degree.

The Dutch research master has three goals¹³. Firstly, the programme must contribute to qualitatively outstanding research achievements now and in the future. Secondly, the research master must offer an appealing working and educational climate to young and talented researchers. Finally, the research master must have a positive effect on the output of the doctoral degrees and the quality of the doctoral degree. Because of this, premature fallout during the doctoral degree may be reduced. The Research Masters are selected by the Dutch-Flemish accreditation organisation (NVAO), particularly taking into account the academic context of the programme, selection of the students and the offered curriculum.

Germany, Austria and Flanders

Neither of the abovementioned three countries have a separate, distinctive research-oriented master as opposed to the regular academic masters. Occasionally, the degree for *Master of Philosophy* programmes is awarded on an institutional level. However, they are separate and isolated initiatives that will not be duplicated in a structural manner as we can see now. A difference between the more research-oriented and the practical profiles is apparent.

Until 2001 Germany had separate titles for research-oriented and applied degrees¹⁴. No distinction is made anymore between the research-oriented and more applied degrees in the most recent structural guidelines from 2003. Masters acquired from a university and other forms of higher educational institutions of similar status (Fachhochschule) allow admittance to the Ph.D. But in extraordinary cases it is also possible to be admitted to the Ph.D with a bachelor's degree. The entrance qualifications are for the universities to decide upon. The German masters are differentiated by including the profile 'more practice-oriented' or 'more research-oriented' into the degree supplement. This differentiation is thus not mentioned in the title proper, but in the supplement to the degree. This distinction in profiles is expressed by the German board of accreditation in a number of criteria. The distribution is verified during the accreditation of these programmes.

The degree M.Phil as awarded abroad is no unknown phenomenon, even though it is not acknowledged by German law: *'Bei dem "Master of Philosophy"(Abkürzung: M.Phil), der in nahezu allen Fachrichtungen erworben werden kann, handelt es sich um eine besondere Form des Mastergrades. Auch er setzt den Besitz*

¹³ Letter of the Dutch secretary of state for Education, Culture and Science, April 15th 2003.

¹⁴ Resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany of 10 October 2003, Common structural guidelines of the Länder as set out in Article 9 Clause 2 of the Framework Act for Higher Education (HRG) for the accreditation of Bachelor's and Master's study courses en de KMK, 1999, 2001, 2003.

eines ersten wissenschaftlichen (Bachelor-) Abschlusses voraus, hier allerdings in jedem Fall mit einer bestimmten Mindestnote. [...] Der M.Phil-Studiengang ist stärker forschungsorientiert als der M.A. oder der M.Sc und kann als höherwertiger betrachtet werden. 1¹⁵

In Austria there is no difference between Research Masters and regular academic masters. Since the introduction of the bachelor / master system in 1999, universities have proceeded to convert the regular programmes to the bipartite bachelor / master system. In 2000, the colleges followed suit. About half of the original programmes have been converted. This change can be seen as the differentiation of quality on a programme level. Only the *Fachhochschule* have compulsory accreditation by the national accreditation board, *Der Fachhochschulrat*. The universities do not have compulsory accreditation. The academic masters give entrance to the Ph.D. The doctorate degree is exceptionally popular in Austria, mainly because of the prestige connected with it.

In Flanders the question of how to pay for the expenses of the academic masters plays a part in the discussion on the *Research Master*. The programme length of four years remained after introduction of the bachelor / master system. Four-year programmes were transformed into three-year bachelors and a one-year master. The Flemish government thinks that Flanders 'should follow the international evolution concerning the length of masters, in connection with the quality of the programmes, the research masters and the doctorate programmes. Failing to go along with developments would seriously damage possibilities for international comparability en mobility'¹⁶. The Flemish government means to approve two-year masters under a number of stipulations. A two-year master with a model in which 90 of the 120 ECTS points are meant for the actual master and 30 ECTS for the different finalities such as teacher's education, specialisation and research. This lengthened course duration concerns programmes in the Sciences and Biomedical sciences. Together with the universities they will evaluate if strongly research-oriented masters in other areas can be transformed into two-year programmes. These programmes will undergo a rigorous selection. Entrance to the Ph.D is possible for students who have acquired their masters.

3. Dimensions in introducing the research-oriented masters

Most Research Masters are a preparation or even an introductory part of the Ph.D and are meant to serve the main goal of organising the research programme as efficiently as possible. This will facilitate a lesser degree of fallout and an improvement of the length of the doctorate so that eventually more people will graduate.

As mentioned above, not all countries mentioned have a separate *Research Master*. In some countries like the U.K., France and the Netherlands this is the case. In other countries like Germany, Austria and Flanders no separate, research-oriented masters that are distinct from the other masters and part of a broader research programme have been developed following the introduction of the bachelor / master system. The quality analysis of the programmes differs for each country as well. In the Netherlands, Flanders and France, it is strongly linked

15 According to the Zentralstelle für ausländisches Bildungswesen (ZAB) beim Sekretariat der Ständigen Konferenz der Kulturminister der Länder in der Bundesrepublik Deutschland.

16 Frank Vandenbroucke, Beleidsnota 2004 -2009, Onderwijs en Vorming, Vandaag kampioen in wiskunde, morgen ook in gelijke kansen.

to accreditation by national government, by the board of accreditation or the government itself respectively. Apart from that the demands related to the research-oriented programmes are different as well. In some countries like France and the Netherlands, the connection with a strong research environment of an established high level is a must, in other countries this is not so much a necessity.

Some dimensions can be extracted from the description of the three clusters of research-oriented master programmes. If we limit this to the European countries, thus leaving the U.S. out of the picture, the following four dimensions can be used for the six countries mentioned above, namely the U.K., France, Germany, Flanders, Austria and the Netherlands:

I) Distinct Research Masters programmes as opposed to other scientific masters, linked to the degree Master of Philosophiae (M.Phil)

Yes with (M.Phil)-----	No, without M.Phil
U.K., the Netherlands, France (M.Phil?)	Germany (with research profile) Austria Flanders

II) Selection Research Masters/academic masters by national government or university

By nat. government-----	By university
The Netherlands, France, (Flanders)	U.K., Germany, Austria

Even more so than with the regular domain or profession-oriented masters, it is important that the Research Masters programme takes place in a good research environment. Student who are guided by competent and active researchers have better chances of becoming competent researchers¹⁷. The ‘academic context’ of the programme must be of an ‘acclaimed high standard’. High demands are thus made of the quality of the educators and the researchers who teach the students their research skills. Besides that, high demands are also made of students who want to participate in the research master. This means that students must have a higher than average grade for their bachelor, which will show their suitability for the research masters programme.

III) Demonstrable connection to and selection based on qualitatively outstanding research environment (of at least proven high standard)

Connection to outstanding research environment compulsory-----	Non-compulsory
France, the Netherlands, the U.K.	Germany, Austria

¹⁷ Ours, van J.C en Ridder G., *Fast Track or Failure: a study of the graduation and dropout rates of Ph D students in economics*. Economics of Education Review 22 (2003) 157-166.

IV) Selection of students for research-oriented masters

Selection students-----	No selection students
France, the Netherlands, Germany, the U.K.	Austria, Flanders

V) (Research) Master is a part of a broader researcher programme (Graduate School, Research School etc.)	
Yes-----	No
The Netherlands, France, the U.K.	Germany?, Austria, Flanders

4. Aims and thesis

Changes in higher education take place in a globalizing world: “perhaps no place has been more subject to these processes of internationalization and globalization than university”¹⁸. The influence of globalization processes on higher education can be interpreted in two contrary ways. On the one hand by the *thesis of convergence* in which the homogenisation of processes plays a central role. On the other hand by the *thesis of divergence* which states the opposite, namely, that differences will originate because of the result of the globalization process, local differences as well as pluralistic ones. The introduction of the bachelor / master system can be seen as a result of the globalization process.

The interesting thing is that despite the process of convergence, which is to say that all the countries described had this two-cycle educational model or introduced it in 1999, a process of divergence is taking place in, among other things, the researcher programmes, for example concerning the Research Masters. As regards the researcher programmes, countries appear to organise these programmes in varying ways. After introducing the bachelor / master system, some countries, like the Netherlands and France, have started with special Research Masters in connection with the researchers programmes, while other countries, like the United Kingdom and the United States already had a special Research Master as part of their researchers programme after the Second World War, and still other countries don't have a specific Research Masters programme connected to the researchers programme at all. There is no differentiation at the master level here. In short, countries choose for different forms in organising and developing their researcher's programmes.

In this study I have chosen to look at the most differing forms. The transition of the master stage to the Ph.D stage is central with in particular the question of whether a Research Master will improve the enrolment into the Ph.D stage. Abovementioned countries that have a distinct research master's programme as well as countries without or with only a partially distinct one, like the research profile in Germany, can be included in the study. This raises interesting questions from an analytical point of view. I would like to select four countries. Firstly a country which has a vast amount of experience with research masters as part of the research education, like the United Kingdom. Secondly a country that has recently made the plunge to introduce the research masters as part

18 Vaira, M., Globalization and Higher Education Organizational Change, Higher Education 48, 483-510.

of the research education, like the Netherlands. Thirdly, a country that does not as yet have *Research Masters*, but where their introduction is a topic of discussion, like Flanders. Finally, a country that has no separate research masters programme as part of the researchers programme, like Austria.

The scientific aim of this study contains increasing the knowledge where management initiatives to improve the enrolment into the Ph.D is concerned. This improvement can be qualitatively as well as quantitatively. I wish to do this by describing and explaining the research programmes in four countries and the effects the Research Master has on the enrolment into the Ph.D stage.

The social aim of this study is to provide insight into the way in which the entry into the Ph.D-fase can be organised as effectively as possible. The central issue here is the effect of the *Research Master* on the improvement of quality and quantity of the enrolment into the Ph.D stage. In short, is there a 'most efficient way' of improving the quality and quantity of Ph.D students? Tied in with this is the question where potential shortcomings can be attributed and how improvements can be made possible in the future.

Central thesis

To accommodate the aims of this study, the next thesis will be the fundamental one:

How far does the Research Master lead to quantitative and qualitative improvement of the enrolment in the Ph.D stage?

According to Braam the dependant variable is the variable that must be explained, 'the factors that, as a result of (or being influenced by) the operation of other factors, that are indicated as independent variable or declarative variable'¹⁹. The improvement of the entry into the Ph.D stage is the dependant variable in this study. The *Research Master* is the independent variable here. Attempts are made to improve the entry into Ph.D-programmes in a quantitatively and a qualitatively fashion through the *Research Master*. Besides that, there are other independent variables that can explain the improvement of quality and quantity of the enrolment into the Ph.D stage. The attraction to the profession of researcher, be it status, financial or economical situation, can be an explanation for the improvement of the Ph.D enrolment. Another independent variable is the institutional connection of the master stage and the Ph.D stage. In some countries there are Graduate Schools where the Research Master students and the Ph.D students are put up and which can be supposed to have an effect on the enrolment in the Ph.D stage.

The central question can be split into a number of research questions:

A) How does the transition of the academic master to the Ph.D proceed in the United Kingdom, Austria, Flanders and the Netherlands?

B) How far does the Research Master influence the enrolment in Ph.D-programmes in a quantitatively fashion?

¹⁹ Van Braam, *Filosofie van de bestuurswetenschappen*, p.44.

- How far will the Research Master cause more students to follow a Ph.D route?

C) How far does the Research Master influence the enrolment in Ph.D-programmes in a qualitatively fashion?

- How far will students of the Research Master be better prepared for the Ph.D stage than students of a regular master's programme?

- How far does the selection of the staff and students lead to better starting qualifications for the students entering the Ph.D stage?

D) How far is the entry into Ph.D-programmes determined by the attractiveness of the profession of researcher?

E) How far does institutional imbedding of the master stage and the Ph.D lead to an improvement of the enrolment into the Ph.D stage?

Because I am in an early stage of my Ph.D- project, I am starting (after a preliminary formulation of the policy issue/question) to formulate a theoretical framework of policy effectiveness. Furthermore I am active with a pilot-study on the Graduate Education developments in The United States and France. The idea is that this will help to focus my Ph.D thesis in an appropriate direction.