Higher Education Dynamics 35

Jim Allen
Rolf van der Velden *Editors*

The Flexible Professional in the Knowledge Society

New Challenges for Higher Education

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New Challenges for Higher Education

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The REFLEX project is a joint collaborative project of the following institutes

Austria	Institut für Soziologie (IfS), Universität Klagenfurt
Belgium	Hoger Instituut voor de Arbeid (HIVA), Leuven
Czech Republic	Education Policy Centre, Charles University Prague
Estonia	Ministry of Education and Research
Finland	Research Unit for the Sociology of Education (RUSE), University of Turku
France	Institut de Recherche sur l'Economie de l'Education (IREDU), Université de Bourgogne
Germany	International Centre for Higher Education Research Kassel (INCHER-Kassel), Universität Kassel
Italy	Istituto IARD Franco Brambilla Consorzio Interuniversitario ALlma Laurea Centre for Study and Research on Higher Education Systems, University of Pavia (CIRSIS)
Japan	Kyushu University
The Netherlands	Research Centre for Education and the Labour Market (ROA), University Maastricht Center for Higher Education Policy Studies (CHEPS), Institute for Governance Studies, University of Twente DESAN Research Solutions
Norway	Nordic Institute for Studies in Innovation, Research and Education (NIFU), Oslo
Portugal	CIPES, Centro de Investigação de Políticas do Ensino Superior
Spain	Centre for the Study of Higher Education Management (CEGES), Technical University of Valencia (UPVLC)
Sweden	Statistics Sweden
Switzerland	Bundesamt für Statistik
United Kingdom	Centre for Higher Education Research and Information (CHERI), The Open University, London

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Acknowledgements

The REFLEX project (acronym for "Research into Employment and professional FLEXibility") is a large-scale international project that has been carried out in 16 different countries. It focuses on the demands that the modern knowledge society places on higher education graduates, and the degree to which higher education equips graduates with the competencies to meet these demands.

In the project three studies were carried out: (1) a country study highlighting the main structural and institutional factors that shape the relation between higher education and work in the different countries involved in the study; (2) a qualitative study on graduate competences in the knowledge society; (3) a survey of higher education graduates in these countries (for more information, see www.reflexproject.org). The results of the first two studies have been published separately (Koucky, Meng and Van der Velden, 2007; Arthur, Brennan and De Weert, 2007).[1] The current publication presents the general findings of the third study, the survey among graduates.

A project like this cannot be carried out without the effort and involvement of many colleagues. In the different countries the following persons participated in the project (the coordinator is always mentioned first, the rest in alphabetical order): Austria (Paul Kellermann, Helmut Guggenberger, Gunhild Sagmeister), Belgium/Flanders (Walter van Trier, Kathleen de Rick), the Czech Republic (Jan Koucky, Petr Vorisek), Estonia (Tiina Annus, Liis Kraut), Finland (Osmo Kivinen, Jouni Nurmi), France (Jean-Jacques Paul, Lisa Bydanova, Julien Calmand, Philippe Maalouf), Germany (Ulrich Teichler, Oliver Bracht, Marek Fuchs, Harald Schomburg), Italy (Roberto Moscati, Angelo Di Francia, Michela Frontini, Michele Rostan, Matteo Sgarzi, Marco Vinante), Japan (Keiichi Yoshimoto, Yuki Inenaga, Naoyuki Ogata), the Netherlands (Rolf van der Velden, Jim Allen, Han van Dongen,

[1] J. Koucky, C. Meng and R. van der Velden (2007), REFLEX Country Study, Research Centre for Education and the Labour Market/Education Policy Centre, Maastricht/Prague. L. Arthur, J. Brennan and E. de Weert (2007), REFLEX – the Qualitative Study: Employer and Higher Education Perspectives on Graduates in the Knowledge Society, Centre for Higher Education Research and Information/Center for Higher Education Policy Studies, Milton Keynes/Enschede of its results in the international workshops held in Valencia, Maastricht, Klagenfurt, Neuchatel, Pavia and Kassel.

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I would like to thank all partners and colleagues for their input.

Maastricht
15 December 2010

Rolf van der Velden
(project coordinator)

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Julien Calmand was trained as economist and has a long tradition in working on quantitative surveys on transition from school to work. He works in Céreq since 2005. He is in charge of the survey of the transition from school to work of French PhD graduates in Céreq Géneration surveys. More precisely, he explores the determinant of being employed in academic career in early career of French PhD graduates. He was involved in the European project REFLEX (sixth PCRD) on transition from school to work of graduates from Higher Education in Europe. Thanks to this project he has explored the link between skills and mobility in early career's path.

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Harald Schomburg trained as a social scientist, is the key researcher of the International Center of Higher Education Research (INCHER-Kassel) in the areas of higher education and employment, survey methods and quantitative data analysis. He played a major role in the longitudinal study on the impact of study conditions and provisions on careers and job assignments in Germany and in the survey on the relationships between higher education and employment in 11 European countries and Japan (CHEERS Project). Since 2007, he is the team leader of the German graduate tracer study "Study Conditions and Professional Success" – a large-scale survey in which more than 100,000 graduates participated. For more than a decade, he was active in consultancy and conducting training programmes for scholars and administrators wishing to undertake graduate surveys as a feedback for their own university. He wrote two handbooks on the methods of undertaking graduate surveys and conducted training programmes in Africa, Asia and Latin America.

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Ulrich Teichler is professor and former director of the International Centre for Higher Education Research, University of Kassel (Germany). Born in 1942, he studied sociology at the Free University of Berlin; was researcher at Max Planck Institute for Educational Research, Berlin; and did his doctoral dissertation on higher education in Japan. He has spent extended research periods in Japan, the Netherlands and the United States; for some period, he was also professor on part-time/short-term basis at the Northwestern University (United States), College of Europe (Belgium), Hiroshima University (Japan) and Open University (the UK). His key research areas are higher education and the world of work, comparison of higher education systems and international mobility in higher education; He has more than 1,000 publications to his credit and is a member of the International Academy of Education and the Academia Europaea, former chairman of the Consortium of Higher Education Researchers, former president and distinguished member of EAIR, and Dr. h.c. of the University of Turku (Finland).

Management Summary

Introduction

Higher education policy has increasingly gained a European dimension, with its own distinct influence over national education policies. Against this background, a major project was launched, the REFLEX project, which aims to make a contribution to assessing the demands that the modern knowledge society places on higher education graduates, and the degree to which higher education institutions in Europe are up to the task of equipping graduates with the competencies needed to meet these demands. The project also looks at how the demands, and graduates' ability to realize them, is influenced by the way in which work is organized in firms and organizations. The REFLEX project has been carried out in 16 different countries: Austria, Belgium-Flanders, the Czech Republic, Estonia, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the UK. The data for Japan, Portugal and Sweden are not fully comparable to that of the other 13 countries, and have been excluded from the analyses presented in this publication. The major part of the project consists of a large-scale survey held among some 70,000 graduates from higher education in these countries. In each country a representative sample has been drawn of graduates from ISCED 5A programmes who got their degree in the academic year 1999/2000. The various types of higher education in the participating countries have for the purposes of this publication been divided into two main levels. First-level programmes are those that do not provide direct access to doctorate programmes, while second-level programmes are those that do provide such direct access to a doctorate. The data collection has taken place in 2005, that is, some five years after leaving higher education. In this publication, the data from the graduate survey is used to shed light on different aspects of graduates' experiences in higher education, work and other areas of life.

The Flexible Professional in the Knowledge Society

In recent years, three major trends have been identified that affect the demands that higher education graduates face. The first is the increasing emphasis on education and training, the second the increasing volatility of labour market processes and the

third the increasing internationalization and globalization. These trends give rise to new demands on the competencies with which individuals need to be equipped. In addition to the more or less traditional demand on higher education graduates to become experts in their own professional domain, graduates face an increased need for to be flexible to ensure employability over their entire career. Moreover, the Lisbon goals imply a strengthening of the innovative capacities of the European economy, and an optimal use of the available human capital. Finally, the globalization of the economy and society requires higher education graduates to be much more internationally oriented than before. Consequently, there are good reasons to believe that higher education graduates are expected to be more or less competent in at least the following five areas: professional expertise, functional flexibility, innovation and knowledge management, mobilization of human resources and international orientation. Chapters 3 through 7 of this publication pay attention to each of these demands in turn.

In the survey, we found evidence that the demands in the areas of professional expertise, functional flexibility, innovation and knowledge management, mobilization of human resources and foreign language skills are more or less universal. In each of the 13 countries for which we presented data, we note that the required level in these areas is relatively high, with only fairly small differences between the different areas of competence and between the countries. The demand for foreign language skills of graduates was less pronounced, and differed quite strongly per country. The strong demand for competences is often, but not always, matched by a strong supply. Some 10% of the graduates indicate that their own competence level is significantly lower than what is required of them in their job. There are some sizable differences between countries. In Italy, France and Estonia, a relatively large share of graduates experience some serious shortages in their competences. In France we also note a relatively larger share of graduates experiencing a surplus in their competences, indicating that in France in particular graduates are ill-allocated to jobs.

There are some interesting differences between countries in the particular profile presented by the higher education system. Whereas a clear majority of graduates in Italy, Switzerland, the UK and Austria regarded their program as demanding, this only applied to around a third of Dutch and Estonian graduates. Whereas the educational systems in Norway, Finland and the Netherlands were strongly vocational in their orientation, in other countries – including Austria and Germany with their famous binary systems – only around a quarter of all graduates described their higher education as strongly vocational. Even in countries in which higher education was strongly vocational in its orientation, few reported that employers were familiar with the content of the program. In general, higher education in Europe appears to be rather broad in its focus, but graduates nonetheless report having had little freedom to compose their own program.

Also in terms of modes of teaching and learning there were some interesting results. Despite the attention that has been paid in recent years to more student-centred and active forms of learning, at the end of the last millennium higher education in Europe remained rather traditional, with a strong emphasis on lectures,

and in many countries on the role of the teacher, and only rather limited application of group learning and project- or problem-based learning. There was generally more emphasis on theories and paradigms than on facts and practical knowledge, although in France and the Netherlands emphasis was slightly more on the latter than on the former. Assessment relies in most countries more strongly on written assignments and oral presentations than on multiple choice exams, although in Spain and the Netherlands the emphasis on the latter is about as strong as on the former. Students in most countries are given little opportunity to gain hands on experience as a formal component of the study program, and such experience as there is usually takes the form of work placements and internships rather than participation in research projects.

The lack of opportunity to gain experience within the formal bounds of the program does not prevent most students from gaining study-related work experience, and in most countries a clear majority of students leave higher education with some form of relevant experience under their belt. Exceptions are the UK and Italy, where three out of every five graduates leave higher education without experience. Many graduates also report having gained other forms of experience while in higher education. The most common form of such experience is non-study-related work experience – casual jobs and the like – but in some countries a relatively high proportion of graduates also report having held positions in student or other voluntary organizations, or having spent time abroad while in higher education. Again there are strong differences between countries, with Dutch and Flemish graduates most likely to have held positions in voluntary organizations, and Austrian and French graduates most likely to have spent time abroad.

Graduates in different countries report very different study behaviours. Whereas French graduates report having put in around 42 h each week on their study, in the Czech Republic, the Netherlands and Estonia graduates reported only around 30 h of study each week. Interestingly, there was little if any relation between the actual hours spent on study and the perception graduates had of doing work above and beyond that required to pass exams. In most countries graduates appeared to be mostly driven by an extrinsic study motivation, that is, a desire to achieve high marks, and much less by intrinsic motivation. Only in Spain and the UK did a slender majority of graduates report that they did work above what was required to pass exams, while most Dutch and Flemish graduates seemed to be neither intrinsically nor extrinsically motivated.

The effects of programme characteristics on competences were surprisingly modest, but demanding and prestigious programs seemed to have a positive effect on most competences. There was evidence that active, student-centred study modes of teaching were more conducive to competence development than more traditional, teacher centred methods. A strong emphasis on theoeries and paradigms was found to stimulate competences more than a practical emphasis, while more information-rich assessment methods such as written assignments and oral presentations were more effective than multiple choice exams. Various kinds of experience were found to promote competence development, particularly study-related work experience, although against expectations no effect at all was found of internships and work placements. After controlling for grades, which were clearly related to competences

in all five domains, hardly any residual effects of study behaviour and motivation were observed.

Does the study program in higher education provide a good basis to enter the labour market? In most countries around half of all graduates indicated that the study program formed a good basis for starting work and a slightly lower percentage indicated that it was still useful five years later in their performance of their work tasks. Graduates were somewhat more positive in their evaluation of their program in terms of further learning on the job and career development. However, that aspect on which graduates evaluated their program most positively was as a basis for personal development. By contrast, only around 20% indicated that their higher education program provided a good basis for developing entrepreneurial skills. In terms of graduates' evaluations, the most successful programs are characterized by having a strong vocational orientation and/or strong academic prestige and in terms of preparation for the labour market a strong degree of familiarity by employers of the content of the program. Modes of teaching and learning showed only rather modest effects on these evaluations. Graduates' competences also affect the evaluation of the study programme. Professional expertise especially improves the evaluation of the programme in terms of preparation for current work tasks and career development, while innovation and knowledge management is most clearly related to the extent to which graduates felt that the study programme prepared them for learning on the job. Functional flexibility is related to a negative evaluation of the programme in many respects, but competences in this area show by far the strongest effect on the evaluation of the programme in terms of developing entrepreneurial skills.

Most programme characteristics have little or no effect on labour market outcomes. Those characteristics that do have effects are those that we might expect to have an influence distinct from that of competences. Graduates from prestigious programmes and of programmes with strong links to the world of work find their way to employment more quickly and assuredly than graduates of otherwise similar programmes with fewer links to employers. Work experience, especially when this is linked to the content of the study programme, has a strong positive effect on labour market outcomes. Time spent abroad during higher education is associated with higher wages. Good performance in higher education in the form of higher grades also gives a boost to labour market outcomes, but once this has been controlled for, there is no residual benefit of study motivation or study behaviour. When we turn to competences, professional expertise stands out as the competence domain that allows graduates to find work most quickly and secures them a higher wage five years after graduates. Competences associated mobilization of human resources also promote success in the labour market.

The Professional Work of Graduates

There are different conceptions within the academic world, and between academics and lay people, in what we mean by the term "professional". The term can be used very generally for example as a contrast to work done by "amateurs", to

indicate someone who has followed specialized training in a given domain, or, as in the Anglo-Saxon tradition, to indicate occupations which normally require a higher education degree. There are also much more restrictive conceptions, in which only a very limited range of occupations like physicians and lawyers are regarded as professionals. Such definitions or typologies usually point to professionalization as a process that can be analyzed using the so-called escalator model: first a school is established, then an association, then examinations, then licensing, then an ethics code, and finally the occupation arrives at its destination. Others place more emphasis on autonomy, expertise, a body of knowledge as defining concepts of professionals. In order to do justice to the range of conceptionalizations of professions and professionals, a typology of occupations was developed, which allow us to differentiate between broad areas of work of higher education graduates. This typology of professions is used as a way of looking at the professional role and identity of graduates, the professional expertise and the aspects of power like income and exclusivity.

Five more or less distinct types of profession are distinguished, namely business and social science experts, science and technology experts, semi-professionals, classical professions and managers. Only around 13% of all graduates were not professionals according to one of these five types. There were strong gender differences between the different types, with females dominating the semi-professions, and also being in the majority among the classical professions and business and social science experts, but in the minority among the science and technology experts and managers. Semi-professionals were most likely to work part time and, together with classical professionals, to have a limited-term contract.

Although a majority of graduates in all groups, even the non-professionals, were working in jobs that showed some relation to their field of study, real exclusivity of knowledge turned out to be only dominant among the group of classical professionals, and to a lesser extent the semi-professionals. These groups also showed the longest time required working on the job after graduation in order to achieve the full status of expert in their field, and had the highest levels of investment in work-related training in the last 12 months. However, the managers had the highest levels of self-reported competences of all the professional types, including competences related to professional expertise.

Turning to the concept of organization, it appeared that classical professionals and semi-professionals were of all groups the most likely to take account of professional ethics in their work, and the former group showed the highest level of damage potential. However, in other respects managers scored higher on aspects of work organization often attributed to classical professions, such as contacts with professional colleagues relating to knowledge and expertise and work autonomy, as well as on aspects more traditionally associated with the role of managers, such as interdependency and responsibility. The differences between professional groups in terms of work orientations were surprisingly small, although managers placed relatively little weight on aspects such as security, less time and work-life balance, and more on such things as new challenges, career prospects, earnings and status, while the reverse was true of semi-professionals.

The classical professions score quite highly on aspects related to power, such as income and absence of competition, although on the latter aspect there are still around half of all classical professionals who report that they work in an organization that is subject to strong competition. Only the group of semi-professionals appears to be really sheltered from competition, with less than a third of graduates in this group reporting high levels. Competition in all groups is much more based on quality than on price. Classical professionals were most likely to be self-employed, to come from households in which one or both parents had a higher education degree, to have entered higher education on the basis of a diploma in the highest track of general secondary education, and to have achieved a second-level degree or doctorate in higher education. They were also most likely to report that their higher education programme was demanding and/or prestigious, and that employers were familiar with its content, but less likely than other professional types to report that it has a broad focus and/or gave them much freedom to compose their own programme.

"Being Flexible": Graduates Facing Changes in Their Work Environment

In the 1990s, greater emphasis was placed on flexibility in the graduate labour market from two different perspectives. One view stressed the increasing precariousness of graduate employment, the loss of job security, and the weakening of graduates' bargaining position. The other stressed that graduates are not just victims of a changing set of circumstances, but can take advantage of the new situation by developing a willingness, and ability to deal with changes in a positive way. In this publication both perspectives are taken into account. Of the various kinds of changes graduates are exposed to in their working environment, we look at changes in the labour market, which are associated with a need for external flexibility, and changes on the work floor, requiring functional flexibility on the part of graduates.

Looking first at changes in the labour market, graduates differ in the degree of job security offered by their work contract, with temporary contracts and self-employment generally offering less security than permanent salaried positions. A large percentage of graduates start off in a job on a fixed term contract, but most have progressed to an unlimited term contract five years later. In contrast, few graduates start out in self-employment, and five years after graduation this proportion has only risen slightly, to about 10%.

In general, only quite modest levels of actual job mobility are observed in the first five years after graduation. Slightly more than a third of graduates have not changed employer at all, and of those who have experienced changes, about half have only done so once. Spanish and British graduates are most often mobile, and Czech, German and French graduates least often. Female graduates are slightly more often mobile than their male peers. Humanities & Arts and Health & Welfare graduates are relatively often mobile, while Engineering graduates are relatively unlikely to change jobs. The shift from one employer to the next is often relatively smooth, and

even among the very mobile graduates (those who have changed employers more than once), about half have never been unemployed. Only one in ten graduates has been unemployed more than once since graduation. The majority of changes took place within the same occupation and/or economic sector. Only about a third of all working graduates changed occupation code between the first and the current job, and a quarter moved to a different economic sector. Even among the very mobile, around half remained in the same occupation and/or economic sector.

In terms of opportunities for skill and career development, job mobility doesn't hurt much. As one might expect, graduates who have changed employer since graduation have somewhat lower levels of mastery of the own field or discipline five years after graduation, but somewhat higher levels of knowledge of other disciplines, learning skills, alertness to new opportunities, presentation skills, and language skills. Although one may debate the direction of causality here, it makes clear that, in general, mobile graduates are not at a severe disadvantage when it comes to developing their competences at work. Furthermore, mobile graduates are on average about as satisfied as non-mobile graduates. There is also relatively little difference between mobile and non-mobile graduates in terms of the competences that contribute to greater job satisfaction. Only higher levels of negotiating skills and alertness to new opportunities were more important for mobile graduates.

Although job mobility is by no means a bad thing in all cases, the move by graduates towards more unlimited term contracts five years after graduation suggests that most would prefer to be in a situation where they, and not their employer, decide when the time has come for them to move on. Five years after graduation several factors were found to increase the chance of having a temporary contract. The younger one is, the less work experience one has acquired since graduation, and the broader the scope of operations and the smaller the size of the organization in which one works, the more likely one is to have a temporary contract. Graduates in the hard sciences or health studies, or of second-level programmes in general, graduates who have obtained postgraduate qualifications, and graduates who work in the education or health sectors, are also relatively likely to have a temporary contract, while graduates in education studies or computer science, or of vocationally oriented programmes in general, graduates working in the manufacturing sector, and graduates working as a manager, legislator or senior official are relatively unlikely to be in temporary employment. Most of these effects remain significant after controlling for temporary employment in the first job.

Turning to the extent to which graduates are exposed to changes in work tasks, with the corresponding need for functional flexibility, this applies relatively often to British and Dutch graduates and relatively rarely to French graduates. It is associated with other forms of change in the organization in which graduates work, and with the extent of innovation. As one would expect, the longer graduates have worked in a given job the more likely they are to have been confronted with changes in job tasks. In the public sector, graduates working in larger organizations are less likely to face changes in work tasks. The broader the scope, the more likely such changes. Graduates working in private sector firms facing more competition are more likely to face changes.

Graduates who have been exposed to major changes in work tasks report that their work requires a higher level of negotiating skills, ability to mobilize the capacities of others, alertness to new opportunities, coordinating skills, ability to assert authority, ability to perform well under pressure, ability to come up with new ideas and solutions, ability to work productively with others, and ability to use computers and the internet than graduates working in more stable jobs. Most of these competences are in deficit among around a quarter to a third of flexible graduates, but a similar proportion reported that these competences are in surplus. Because deficits and surpluses depend on demand as well as supply characteristics, attention is also paid to the competences that were regarded as strong or weak points of the study programme. Mastery of one's own field or discipline, analytical skills and learning skills were the main strong points mentioned, and language skills, ability to assert authority and ability to negotiate effectively were the main weak points.

The authors also looked at characteristics of the study programme that were more important as determinants of the extent to which graduates felt that their study programme was a good preparation for current work tasks. Emphasis on theories and paradigms was positively related to the evaluation of the programme by flexible graduates but not by non-flexible graduates. In contrast, participation in internships or work placements and emphasis on written assignments was positively related to the evaluation of the programme only for non-flexible graduates.

The Graduates in the Knowledge and Innovation Society

The knowledge economy is located at the confluence of two main developments, namely the growing importance of activities related to human capital and the development of information and communication technologies. Against this background it is only natural that many organizations have responded to increased competition associated with the globalization of the world economy by pursuing innovations in products, processes or markets. There are at present different methodologies to measure the extent of R&D and innovation activities, such as the "Frascatti manual", which emphasizes the human and financial resources devoted to R&D, the "Canberra manual", which aims at measuring Human Resources in Science and Technology, and the "Oslo manual", which offers guidelines for collecting and interpreting technological innovation data. It was not practically possible to incorporate any of these methodologies in a general purpose written questionnaire such as was used in the REFLEX project. Instead, graduates were asked to characterize the extent of innovation in their own organization in terms of products/services, tools/technology/instruments and knowledge/methods, and to indicate whether they themselves have played a role in introducing such innovations. They were also asked to indicate whether their organization was at the forefront or more a follower in terms of innovation.

These measures are emphatically intended as a complement rather than substitute for existing methodologies. The results presented in this chapter confirm that higher education graduates are crucial actors in the innovation process: more than

half report that they play a role in introducing innovations in their organization. Innovations are not restricted to industrial processes, but are also important in service sectors, even in the public sector (education, health). Innovative graduates play the role of knowledge workers and expert technological gatekeepers. Their jobs show a number of specific characteristics: a high level of autonomy, more leeway to define their own goals and to perform their tasks.

An interesting paradox that emerged in this chapter is the following: although innovation is more strongly developed in large organizations, small organizations offer graduates more opportunities for graduates to play a role in introducing innovations. This is because graduates working in large organizations form just a cog in a very large wheel, whereas those working in small organizations are in a position to strongly influence the course followed by those organizations.

Graduates who play a role in introducing innovation have quite a specific competence profile, scoring highly on typical researchers competences, on teamworking competences and on field-specific knowledge and skills. The study programmes of graduates involved in innovation are frequently demanding, and offer good opportunities to participate in research projects and internship. Modes of teaching involving an active participation by students, such as project- and problem-based learning, also seem to provide a good basis for preparing graduates to be part of the innovation society.

When earnings are considered, innovative activities appear to be rewarded, in the private sector. That confirms the impression that innovation is recognized as valuable by organizations.

Mobilization of Human Resources

In addition to their role as producers of human resources, higher education institutions may also have a role to play in teaching students how to put human resources to better use. There are two aspects involved here. Students may learn to make better use of their own capacities, and they may learn to put the human resources of others to better use. Based on the assumption that learning by doing is likely to be a good way to develop the relevant competences for this, we looked for evidence that graduates were actively mobilizing human resources during their time in higher education. European students seem somewhat economical with the effort they put into achieving good study results in higher education. Only a minority report doing substantial extra work above what was required to pass their exams. Students appear to be more extrinsically than intrinsically motivated: to the extent that they put in extra effort, they want to see this rewarded in the form of higher grades. There are substantial differences between countries, with Dutch graduates putting in the least and Spanish graduates putting in the most effort according to the indicators used.

If students don't work as hard as they might on their study, this does not mean that they are idle. On average students put in almost 30 months during their study on other activities, mainly paid employment. Again, we see strong differences between countries, with Spanish graduates doing least and Dutch graduates the most. This

result would appear to suggest that there is a trade-off between study and extra-curricular activities, but multivariate analyses reveal that the relation between the two is surprisingly weak. Although non-study-related work experience is related to lower levels of intrinsic and extrinsic study motivation, study-related work experience appears to increase both forms of motivation. Neither form of work experience has any effect on study hours. Of various programme characteristics, the degree to which a programme was regarded as demanding has the strongest effects on study hours as well as on intrinsic and extrinsic motivation. In the case of study hours this is only to be expected, but one might imagine that students of programmes that are especially demanding would find extra work and striving for higher grades a luxury that they can ill afford. The positive effect of demanding programmes may suggest that students who are challenged by a demanding programme rise to the challenge by working even harder than they need to get their degree.

Of six competences which were thought to be particularly relevant to mobilizing human resources, the ability to mobilize the capacities of others was most often regarded by graduates as a weak point of the study programme. This applied even to graduates who reported that their own level of this competence is high, which suggests that graduates may develop this competence at work rather than during higher education. Demanding study programmes are particularly effective in fostering mobilization competences. Student-centred modes of teaching and learning like groups assignments and oral presentations also have quite strong effects on several mobilization competences, as does a strong emphasis on theoretical and practical knowledge. A good knowledge base may make it easier for graduates to make the most out of their own and others' human resources. Of the various forms of extra-curricular activities, the strongest effects are found for positions held in voluntary organizations during higher education, especially on the competences thought to be relevant for mobilizing the human resources of others. A little surprisingly, study hours and intrinsic and extrinsic study motivation have almost no effects on mobilization competences.

In general, higher education graduates seem to be rather successful at mobilizing their own capacities in their current work. Most are employed in a more or less full-time capacity in jobs that match their own level and field of education. Relatively few graduates report that their capacities are underutilized. Even those graduates who work in jobs requiring no tertiary education often manage to utilize a good proportion of their capacities, particularly those competencies that were predicted to be relevant for mobilization of human resources. And graduates are not only active in the world of work: a large proportion are also engaged in training, family care or voluntary work. This even applies to full-time working graduates, although they are somewhat less likely to be engaged in family care or voluntary work (but not training) than graduates who work shorter hours or not at all.

Although the percentages are lower, a considerable proportion of graduates also occupy positions in which they are responsible for mobilizing the capacities of others. About a third of graduates are supervisors, and about a quarter bear a high degree of responsibility for quality control. In small organizations almost half of all graduates bear a high degree of strategic decision-making authority, although in

medium and small organizations this proportion drops to about a quarter and a fifth respectively.

Surprisingly, the degree of mobilization of own capacities appears to be more strongly influenced by one's own level of professional expertise than by specific mobilization competences. There are relatively few residual effects of higher education characteristics and experiences after competences have been taken into account. However, one's social network appears to be a good predictor of all forms of mobilization of human resources, suggesting that knowing the right people can help get one into demanding jobs with real authority. Several characteristics of the organizations graduates work in and the context in which it is located have significant effects on mobilization. Private sector employees are less likely to utilize their own capacities, but more likely to play some kind of leadership role in the organization. A similar split is observed for reorganizations, which have negative effects on utilization, but positive effects on mobilization of others. Working in an organization which is at the forefront in terms of innovation has a positive effect on all forms of mobilization.

International Dimensions of Higher Education and Graduate Employment

In the framework of the REFLEX study on graduate employment and work, attention was paid to mobility over the life course: the country of origin and the country of residence at different life stages. About 4%of the graduates surveyed in the REFLEX study were born in another country than that where they attended higher education. A higher proportion of graduates – about twice as many across all countries had parents who were born in another country. The proportion of foreign-born graduates varied strongly from about 10% among those graduating in Switzerland and the UK to 2% or less in Belgium, the Czech Republic, Estonia, Finland, Italy and Spain. The data show indicate further that most of these graduates did not immigrate in early childhood, but rather came specifically for the purpose of study.

Around a quarter of the graduates reported that they spent a period abroad during their stay in higher education for purposes work or, as was more usual, study. The average time spent abroad was around half a year. There were substantial differences by country, but even countries where experience abroad was less common (Spain, Italy, the UK, Estonia and Norway), it was by no means an exception.

Not counting foreign born graduates, 7% of graduates – around one in six of all graduates who embarked on further study after graduation – reported having spent some time abroad after graduation for the purpose of further study. The average period of subsequent study abroad was four months. Sixteen percentage of graduates spent time abroad after graduation for work, for an average of 11 months. Four percent of graduates actually lived abroad at the time of their first employment after graduation, and 3%lived abroad five years after graduation. The main destination countries for graduates working abroad were Germany, the UK, Switzerland and the United States.

Graduates who were internationally mobile during higher education had a smoother transition to employment in some respects than those who were not mobile. Their job search period was somewhat shorter, and their overall period of unemployment during the first years after graduation was clearly shorter on average. In contrast, these graduates changed employers slightly more often during the first five years after graduation than graduates who had not been internationally mobile during higher education.

Of the REFLEX respondents who had graduated in the country where they were born, 15% had been abroad only during higher education, 10% had international experience both during their course of study and during the first few years after graduation, and 11% had been internationally mobile only during the first few years after graduation. Those who had been mobile come more from families with at least one parent who graduated from higher education, have been over-proportionately enrolled in Humanities programmes and under-proportionately in Education or Health and Welfare, are more likely to have been enrolled in second-level programmes, were more active in student- or other voluntary organizations, and have participated more frequently in internships or other work experience during the course of study. Despite the well-documented overrepresentation of women in the ERASMUS programme, in the REFLEX survey the percentage of women among the internationally mobile graduates is not higher than among the non-mobile graduates. Also, those mobile during and shortly after the course of study did not report a higher number of hours of study than those who had not been mobile. They did report having achieved higher grades.

In several respects, international mobility during or shortly after graduation seems to lead to somewhat more successful employment. Mobile graduates on average work in higher status jobs requiring at least some tertiary education, in full-time employment, with higher earnings, in more innovative organizations, and especially in more internationally oriented organizations. They are however more likely than non-mobile graduates to have a temporary work contract, and are not appreciably more satisfied with their work in general.

International experience is a key asset for acquiring foreign language proficiency. Graduates who had been internationally mobile before their study, and particularly those who had been mobile during or after their study, reported clearly higher levels of ability to write and speak in a foreign language than non-mobile graduates. Jobs requiring a high level of foreign language proficiency are characterized by higher social status, better career prospects, better opportunities to learn, and higher wages. At the same time, jobs requiring high language proficiency are somewhat more frequently part-time.

Not altogether surprisingly, graduates who were mobile during higher education were more likely to work abroad five years after graduation than non-mobile graduates. Those working abroad stated far more often than the professionally non-mobile ones that their job is characterized by good career prospects, opportunities to learn and high status, that they work in organizations that are innovative with respect to technology, tools or instruments, and that they work in managerial or professional positions. They earned about one tenth more per month than those working at home.

On the other hand, those working abroad had a longer transition to employment, and experience lower levels of job security. Finally, more than twice as many graduates working abroad than those working at home are employed in an organization with an international scope.

Winners and Losers

This chapter looks at both objective and subjective determinants of success and failure in the labour market. The indicators of objective success or failure are the employment situation – have graduates managed to secure paid work, and if so does this match their own attained level and field of higher education? – and the wages earned. The subjective measures concern work values and the realization of these values, and job satisfaction.

Almost three quarters of all graduates were in "relevant" employment at the time of the survey, that is to say held a job that matched both their level and field of higher education. Slightly less than one in ten graduates were "vertically mismatched" (i.e. held a job for which a lower level of education would have been more appropriate, but which did match their own field of education). Around one in twelve graduates were "horizontally mismatched" (i.e. held a job at their own level for which a different field would have been more appropriate). Six percent of graduates worked completely outside their own educational domain (i.e. held a job for which both a lower level and a different field of education would have been more appropriate). Of those who are in the labour force, 4% of all graduates surveyed are unemployed. These shares differ by country, by level and field of education, and by other personal or higher education characteristics. Relatively few British, Spanish and first-level Czech graduates, and relatively many Finnish and Norwegian graduates, were in relevant employment. A large proportion of the Czech and British first-level graduates who were not in relevant employment were "only" horizontally mismatched, and a large proportion of British and Spanish second-level graduates who were not in relevant employment were "only" vertically mismatched, but all these groups showed high levels of graduates working completely outside their own domain. Unemployment was most prevalent in the southern European countries Spain, France and Italy. Second-level graduates in general are somewhat less likely to hold relevant employment than first-level graduates, but this is mainly due to their higher propensity to find employment in lower level tertiary jobs. Vertical mismatch among first-level graduates is less common, but more likely to involve jobs below tertiary level. Humanities, Services, Social Science and Science have the highest share of both horizontally mismatched graduates, as well as of graduates who work completely outside their own educational domain or are unemployed.

Study-related work experience during higher education increases the probability of holding relevant work, as does having graduated from a prestigious and/or vocationally oriented study. Female graduates have somewhat higher risk of being unemployed or over-educated than males. Having a useful social network reduces the risk of working completely outside one's own educational domain. Higher

grades are related to low levels of vertical mismatch as well as of working completely outside one's own educational domain. The risk of unemployment or of working completely outside one's own educational domain is negatively related to total work experience since graduation, while having been unemployed more often and for a longer time seriously increases these risks.

Allowing for differences in purchasing power, graduates from Switzerland, Germany and Norway have the highest wages, while Italian, Spanish, Estonian and Czech graduates earn the least. These differences remain large even after controlling for differences in human capital other factors that are related to wages. After taking such factors into account, large wage differences persist according to gender (females earn less), level and field of study (Business and Computing graduates, and second-level graduates in general, earn higher wages, and Agriculture and Humanities the lowest), education-job match (graduates who are vertically mismatched or working completely outside their own educational domain earn lower wages), and type of employment contract (those in temporary jobs earn less than those with a permanent contract).

Turning to the subjective indicators of success, factor analysis of ten work-related values distinguished three types of work orientations, namely a career and status orientation, a professional/innovative orientation, and a social orientation. The average score per country on the career dimension corresponds negatively with wage levels, suggesting that this orientation may be more salient when a successful career is less assured. Country differences are much smaller when it comes to professional/innovative values; such orientations seem to be shared by the vast majority of respondents, although the scores are particularly high in Austria and Switzerland. In terms of social values, Spanish graduates score especially high, and British graduates score rather low. The pattern of scores per country was similar for males and females, although males scored higher than females in most countries on the career dimension, while females scored clearly higher than males on the professional/innovative and especially the social dimension in all countries.

Defining "winners" on each dimension as graduates who found the underlying values important and who succeeded in realizing them in their current work, and "losers" as graduates who found the underlying values important but failed to realize them, the data showed that there were far more winners than losers on all three dimensions. Especially on the professional/innovative dimension the vast majority of graduates – almost two thirds – could be classified as winners. In comparison, just over one fifth of graduates were winners on the career dimension, and almost three in ten were winners on the social dimension. There were few losers on the professional/innovative and social dimensions, but more than one in ten graduates was a loser on the career dimension.

Women were clearly more likely than men to be winners on the social dimension, but in other respects the gender differences were slight. The Estonian, Spanish and the British samples have high shares of winners on the career dimension. In the case of Spain and Estonia this is striking, since wages are distinctly low in these countries. Spanish graduates are also often the losers on this dimension, suggesting that objective success or failure may be valued in relative rather than absolute terms, a

supposition which is further supported by the finding that the high income countries Switzerland, Germany and Norway do not show high proportions of career winners. The country differences in terms of professional/innovative orientations are less striking, but Italian and Spanish graduates are more often losers and Austrians more often winners. There are few losers in any countries on the social dimension. Norway and Spain show the highest and Germany the lowest share of winners on this dimension. Business and Law graduates are often winners on the career dimension, while those graduating in Education studies are most likely to do well on the social dimension. There are only small differences by field of study on the professional/innovative dimension. Graduates in Humanities and Agriculture and veterinary are relatively unlikely to be winners on the career dimension. In general, second-level graduates are less likely to be losers, but no more likely to be winners, on the career dimension than first-level graduates.

Having followed a prestigious study programme increases the chance of being a winner on the career and/or professional/innovative dimensions, as does having a good social network, and having followed a vocationally oriented study programme. Grades in higher education barely have any effect on the chance of being a career winner, but does somewhat improve the chances of being a winner on the professional/innovative dimension. Vocational orientation also has a small positive effect on the chances of being a winner on the social dimension.

Working completely outside one's own educational domain has a large negative effect on the probability of being a winner for all the three winner-categories, and a positive effect on the risk of being a loser on the career and professional/innovative dimensions. Being vertically mismatched strongly reduces the chance of being a winner on the career and professional dimensions, but has a small positive effect on the probability of being a winner on the social dimension, which might indicate that some of these graduates prefer a less demanding work situation because this makes it easier to combine work and family tasks. Working in the private sector only slightly increases the probability of being a career and/or professional/innovative winner, but strongly decreases the chance of being a winner on the social dimension. As might be expected, wages have a strong effect on the probability of being a career winner. Wages also have a small impact on the probability of being a winner/loser on the professional/innovative dimension, but little or no effect on the social-values dimension. Having a permanent contract has a small positive effect of the chances of being a career-winner, a small negative effect on the chance of being a winner on the professional dimension, and a large positive effect of being a winner on the social-values dimension.

Overall, more than two thirds of all graduates reported that they were satisfied with their current work. Graduates in the Czech Republic, Austria, Norway, Belgium, Estonia and Switzerland are most often satisfied with their work, while Italy and Spain have the lowest shares of satisfied graduates. Those who are winners on the professional/innovative dimension are most often satisfied with their job, followed by winners on the career dimension, winners on the social-values dimension. The realization of professional/innovative and social values is more important for job satisfaction in higher income countries than in low income countries, but

winning or losing on the career dimension has more or less the same effect in the two types of countries. Wages clearly have a larger impact on job satisfaction in the low income countries than in the other nine countries. Mismatches between education and work, especially working completely outside one's own educational domain, has a strong negative effect on job satisfaction. Those who work in public sector are somewhat more often satisfied with their work than those working in the private sector, especially in low income countries. There are generally only small effects of gender, level and field of education, although graduates in Education studies are more often satisfied with their work than the other groups.

Conclusions and policy implications

Several conclusions and policy implications were identified which were thought to be relevant to one or more of following stakeholders: the European commission, national governments, employers, higher education institutions and students.

The mainly policy conclusions for the European Commission were:

- International graduate surveys offer important insights into the changing European higher education systems: they should be repeated at five-year intervals.
- Although higher education is increasingly internationally oriented, this does not keep pace with the even more rapid trend towards globalization. The European Union should do more to foster international exchange in higher education and to strengthen foreign languages proficiency.

The mainly policy conclusions for national governments were:

- Strengthen both the academic and vocational orientations in higher education. Both have a distinct value in preparing for the labour market.
- Encourage work experience during higher education, especially experience that is related to the study programme.
- External flexibility is not always bad. National policy should focus on promoting a smooth transition between jobs, and on encouraging graduates to choose temporary employment above unemployment.

The mainly policy conclusions for employers were:

- Employers should be aware of the large reserves of underutilized human capital at their disposal.
- Employers should develop better policies to accommodate the feminization of the graduate labour market, that is, to attract and retain women, also in top positions.
- Employers should look for more direct signals of graduate quality, and rely less on traditional signals such as prestige of the programme.

The mainly policy conclusions for higher education institutions were:

- Study programs should be more demanding.
- Study programs should focus on strengthening professional expertise.
- Student-centred methods may work, but don't ignore the value of knowledge.
- Assessment drives learning as well; written assignments and oral presentations should be preferred above multiple choice exams.
- Give credits for relevant work experience.
- Don't overestimate the positive effect of internships and work placements.

The main policy conclusions for students were:

- Follow your interest and talent.
- Acquire relevant experience outside higher education.
- A good network is highly relevant; take time to develop yours.

Chapter 1
Introduction

Jim Allen and Rolf van der Velden

1.1 The Policy Context

In a recent communication, the European Commission (2003) seeks to start a debate on "the role of Universities[1] within the knowledge society and economy in Europe and on the conditions under which they will be able to effectively play that role". As Europe and the rest of the world move towards a knowledge society, an effective system of higher education is seen as increasingly important to the economy and to society at large. Given the breadth of the concept, it should come as no surprise that there are differing conceptions of what the knowledge society is and the part to be played in it by higher education. Notions of "super-complexity" in society and economy (e.g. Barnett, 2000) suggest greater divisions of labour and a further fragmentation of academic disciplines in the university (Clark, 1996). On the other hand, notions of "flexibility" in professional life suggest greater emphasis on generic "transferable" skills in the workplace and interdisciplinarity and integration in the university (Mason, 2001). There are similar ambiguities related to the trend towards increased participation in higher education, which inevitably leads to the "massification" of higher education (e.g. Gibbons et al., 1994; Scott, 1995; Trow, 1987, 2000). Despite the move towards a knowledge society, this has led many scholars to raise the spectre of over-education: according to this view the supply of highly educated labour outstrips demand, and an increasing proportion of graduates are forced to work in jobs for which a lower level of education would be more appropriate (Asselberghs, Batenburg, Huijgen, & de Witte, 1998; Burris, 1983; Smith, 1986). Although the evidence for over-education and the interpretation of its effects are disputed (Allen & Van der Velden, 2001; Halaby, 1994; Oosterbeek & Webbink,

[1] Taken to mean all higher education institutions, including for example Fachhochschulen, polytechnics and Grandes Ecoles.

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1996; Teichler, 1999; World Bank, 2002), it is certainly clear that higher education no longer *automatically* confers an elite status on its bearers.

Such ambiguity as to the meaning of the knowledge society is reflected in tensions in the demands made on those fulfilling key positions in the knowledge society. On one hand, these workers are expected to possess the advanced and often highly specialised knowledge and skills required of modern high-level professionals. On the other hand, in many cases they are also expected to be highly flexible and adaptable, able and willing to take up challenges not closely related to the specific field in which they have been trained. For access to key positions, tertiary education is increasingly becoming a necessary, but no longer a sufficient, condition. Whether because of the need to guarantee excellence or of the need to protect privileges of the in-group against outsiders, or a combination of both, entry to many professions is subject to an increasingly complex and demanding set of criteria.

Against this background, higher education policy has become increasingly European, and national education policies have reflected goals at the level of Europe as a whole in addition to specific national goals. The Bologna declaration and the subsequent initiatives have put higher education in the centre of EU policy with the goal to create a "Europe of knowledge". The EU has the ambition "to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion" (European Commission, 2000). Universities have a vital role to play in realising this goal (European Commission, 2003).

1.2 The REFLEX Project

Recently a major project was launched, the REFLEX[2] project, which aims to make a contribution to assessing the extent to which this ambitious goal is likely to be met, and to identifying possible stumbling blocks that may be encountered on the way. The project focuses first of all on providing a more detailed description of the demands that the modern knowledge society places on higher education graduates. A second major focus of the project is on assessing the degree to which higher education institutions in Europe are up to the task of equipping graduates with the competencies needed to meet these demands. Thirdly, the project looks at how the demands, and graduates' ability to realise them, are influenced by the way in which work is organised in firms and organisations. Fourthly, because graduates are motivated by objectives that are broader than just the world of work, the project will pay explicit attention to the goals, aims and orientations of graduates. Finally, the project looks at the transition from higher education to work and later occupational outcomes, and at how these are affected by particular characteristics of graduates,

[2]The acronym stands for Research into Employment and professional FLEXibility. For detailed information on the project, see http://www.reflexproject.org

higher education institutions, employers and the broader institutional, structural and cultural context within which all these actors operate.

In the following section we briefly describe a number of important trends that have been observed in the graduate labour market in recent years that affect the nature of the demands placed on higher education institutions and their graduates. These trends and associated demands have been a key focus in the development of the main instruments deployed in the REFLEX project, and determine to a large extent the structure and content of this report. Following this, in Section 1.4, we briefly describe the methods and data used. Section 1.5 concludes the chapter by providing a brief overview of the subsequent chapters.

1.3 Trends and Demands

1.3.1 Three Trends...

In recent years, three major trends have been identified that affect the demands that higher education graduates face. One obvious trend is the increasing emphasis that has been placed on education and training, which is seen by many as the most important factor affecting economic growth (see e.g. World Bank, 2002). The term *knowledge society* has been coined to indicate not only the expansion of participation in higher education or of knowledge-intensive or high-technology sectors of the economy, but rather a situation in which the characteristics of work organisations across the board change under influence of the increasing importance of knowledge (Teichler, 1999). The second trend relates to changes in labour market processes. Schmid (2000) introduced the concept of the *transitional labour market* to indicate how in modern society, the demarcation lines between work, leisure time, education and care have been blurred, leading to increased mobility and flexibility patterns, to de-standardisation of the life course and to an overall focus on employability. This holds especially true for those in transition from education to work. There is ample evidence that the transition is non-linear and chaotic (Hannan & Werquin, 1999) and that many graduates and school-leavers find themselves in a precarious situation (OECD, 2000). The third trend relates to the *internationalisation* and *globalisation* of product markets and labour markets and their impact for higher education (Marginson & van der Wende, 2006; Van Damme, 2001).

1.3.2 ... and Five Demands

The above-mentioned trends give rise to new demands on the competences with which individuals need to be equipped. Higher education graduates have long been expected to become experts in their own professional domain. However, the dynamic nature of the labour market and increased mobility also imply a much higher degree of flexibility and the possession of broad generic competences to

ensure employability in a range of situations over their entire career. Moreover, the Lisbon goal includes strongly increasing the innovative capacities of the European economy, and an optimal use of the available human capital. Finally, the globalisation of the economy and society requires higher education graduates to be much more internationally oriented than before. Consequently, there are good reasons to believe that higher education graduates are expected to be more or less competent in at least the following five areas: professional expertise, functional flexibility, innovation and knowledge management, mobilisation of human resources and international orientation.

1.3.3 Professional Expertise

Many higher education graduates are expected to become experts in their professional field. Experts distinguish themselves from novices by their superior mental organisation of, and ability to recall, domain-specific knowledge, and by the way they approach problems, make diagnoses, use automated procedures, have intuitive feelings about solutions and correctly infer conclusions and interpretations (Boshuizen, 1989). Expertise implies, first and foremost, a high degree of *mastery of the knowledge and skills* that are relevant in one's own domain of work. Mastery alone does not, however, make someone an expert. A second characteristic feature of experts is *analytical thinking*, the ability to use this mastery to diagnose and solve complex problems in their own area of work. As graduates gain more experience, they will develop tacit knowledge and an ability to quickly recognise patterns. Finally, since experts are often expected to act as an authoritative consultant or advisor for others, they need to be able to *command authority* and act decisively in uncertain situations. It is usually assumed that it takes five to ten years of relevant work experience to become an expert in this sense (Ericsson & Crutcher, 1990; Hayes, 1981),[3] so few of the graduates approached in our survey will have fully attained this level of expertise. It is, however, of interest to obtain a view of how far the graduates have progressed along this path, and of course the degree to which employers demand such expertise.

1.3.4 Functional Flexibility

The world of work is dynamic rather than static. Rapid developments in technology, markets, organisations and relevant knowledge make it necessary that higher education graduates are able to take up diverse challenges, many not directly related to

[3]It should be noted that we make an analytical distinction between "expertise", which refers to the ability to perform in an expert manner, and formally designated professional roles assigned to "experts" working in certain occupations. Of course, many "experts" in the formal sense will also possess a high level of expertise and vice versa, but the two concepts are not identical.

their own field of expertise, and to quickly acquire new knowledge. They must be broadly employable and have the ability to cope with changes (Schmid, 2000). This may relate to changes in the job content, mobility within the organisation to another job or mobility to other organisations. In order to be flexible, graduates obviously need a well-developed *ability to adapt to changes* in the environment; for example, by quickly learning new knowledge and skills, by possessing a large reserve of general or multidisciplinary skills, and an ability to cope with changes. It is important to note that such a response, which can be characterised as "changing the worker to fit the job," is not the only way graduates can respond to change. Another possibility is that graduates *change the environment* in which they work, so as to make better use of their existing skills despite the changes that have occurred in the demands being made of them. Finally, flexible graduates need to possess a high level of *ability to deal with change in a positive way*, seeing changes as windows of opportunities rather than as threats, being eager to learn and to try new things, and using their work as a tool for acquiring new competences through experience.

1.3.5 Innovation and Knowledge Management

In considering the importance of higher education graduates for the knowledge society, it is important to take account of the fact that such workers are often expected to do more than simply carry out a set of prescribed tasks. In many sectors of the economy, employers look to highly educated workers to provide ways of expanding and improving the way in which they provide goods and services. This relates not only to the innovation capacity of higher education graduates, but also to their ability to create an environment in which knowledge production and diffusion is optimised, and to implement innovation in their own job as well as in the organisation as a whole (Cörvers, 1999). Hence the term *innovation and knowledge management* indicate the whole process from developing ideas to implementation. There are thus various ways in which graduates can make a contribution. First of all, graduates who possess a high degree of *innovative capacities*, creativity, curiosity, a willingness and ability to question the status quo, absorptive capacity and so on can directly contribute to the development of new knowledge and ideas for the organisation to use. Secondly, since not all innovations need to be developed within the firm or organisation itself, graduates can contribute to innovation by *gaining access to new ideas* developed elsewhere. For this reason, an ability to notice new opportunities, access to relevant networks and networking skills, organisational learning capacity, ICT-skills, foreign language abilities and communication skills in general can be of crucial importance for the introduction of new ideas to the organisation. Related to this is the ability to *synthesise information* from different sources, to draw connections between apparently disparate subjects and to transfer existing ideas to new applications. Finally, since even the greatest ideas rarely implement themselves, an *ability to implement ideas*, to take an idea from the drawing board to the work floor, requires a high degree of organisational abilities.

1.3.6 Mobilisation of Human Resources

Higher education graduates are expected to have the ability to effectively mobilise their own competences and actively steer and direct one's own work as well as that of others. Several aspects can be distinguished. First of all, graduates need to possess a strongly developed ability to mobilise and make use of their own competences, which implies an ability to work autonomously when working alone, to cooperate fruitfully with others when working in a team, to manage their own skills, and to be motivated intrinsically by the work at hand. Secondly, graduates may be called upon to mobilise the capacities of others. This is associated with leadership skills, but the concept is broader, involving an ability to communicate ideas and inspire others, to plan and monitor work processes, and where necessary to be assertive and to take decisive action. Related to the first two aspects, graduates need to be able to organise work so as to make optimal use of the available human resources, creating synergies in teams, setting up clear lines of communication, and where necessary adapting the work environment to fit better with their own competences and those of their colleagues or subordinates.

1.3.7 International Orientation

Globalisation and the blurring of national borders increase the importance of a strong international orientation. This requires not only a good command of foreign languages, but also an ability to understand and empathise with other cultures, a willingness and ability to appreciate the limitations of the own national context, in short the development of intercultural competences.

It is obvious from this brief overview that the five demands are by no means mutually exclusive. There are, for example, good reasons to believe that expert knowledge is an important prerequisite not only for professional expertise but also for innovation and creation of new knowledge. Although the ultimate goal is different in each case, functional flexibility, innovation and knowledge management and mobilisation of human resources are all related in one way or another with graduates' ability to act as an agent of change. Moreover, there are overarching competences like reflectivity (Rychen & Salganik, 2003) that may be important for meeting all these demands.

1.4 Methods and Data

The REFLEX project has been carried out in 16 different countries: Austria, Belgium-Flanders, Czech Republic, Estonia, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the UK.[4]

[4]Not all countries are represented in this report. Sweden has been excluded because the survey in that country used a methodology that was quite different from that used in the other countries. Because the response rate was quite low in Portugal and the resulting data set very small, this country has been excluded. Finally, as the only non-European country participating in REFLEX,

The major part of the project consists of a large-scale survey held among some 70,000 graduates from higher education in these countries. The project focuses on the careers of highly skilled professionals. The first ten years of these careers follow more or less the following pattern: an initial phase of transition to the labour market in which the focus is on job search and integration into the labour market, a second phase in which essential professional expertise is gained and career patterns start to crystallise and a third phase in which graduates assume greater responsibility on the basis of their increasing professional expertise. Appropriate moments to survey these careers should correspond more or less with the transitions between these phases. These are points in time when graduates are well placed to reflect on their experiences in the current or earlier phases, as well as on their expectations with respect to the phase they are about to enter. In our view these points are one to two years after graduation, some five years after graduation and some ten years after graduation. In the REFLEX project we have focused on the group that is nearing the end of the second phase, meaning that graduates were approached around five years after leaving higher education.

We restricted the sample to graduates of ISCED 5A programmes (bachelors and masters or equivalent). These are programmes at the first stage of tertiary education that are "largely theoretically based and are intended to provide sufficient qualifications for gaining entry to advanced research programmes and professions with high skills requirements" (OECD, 1999). We excluded graduates from ISCED 5B programmes, as these programmes are more practically oriented, and as such are not generally the high-level professionals we seek to investigate in our project. For practical reasons we also excluded graduates of the second stage of tertiary education (ISCED 6), as most countries have no good registers of graduates from this level. Of course, many graduates from ISCED 5A programmes in the target year have since undertaken doctorate-level studies, some of which have actually obtained their doctorate by the time the survey was undertaken. We also excluded ISCED 5A qualifications that are not considered as points of exit from education to the labour market, but are mainly seen as preparatory qualifications for a subsequent next phase of the same programme. We also excluded postgraduate programmes at ISCED 5A level. The appendix contains a full list of programme types that are included in the sample in each country.

In most countries – Spain, Austria, Germany, the Netherlands, the UK, Norway and Estonia – the population consisted of graduates of ISCED 5A programmes as described above who graduated in the academic year 1999/2000. In a number of countries – Italy, France, Switzerland and Finland – the cohort was defined in terms of the calendar year 2000. Finally, in Belgium-Flanders and the Czech Republic, where the data collection was conducted later, the target cohort was adjusted so as to ensure that the graduates had been in the labour market for a comparable length of time to graduates in the other countries. In Belgium-Flanders this was the academic year 2000/2001, and in the Czech Republic calendar years 2001/2002.

Japan is very different from all other countries in many if not most respects. If included, it was felt that this would have the undesirable effect of diverting attention away from the diversity of outcomes within the group of European countries, which is the key focus of this report.

The size of the sample varied according to the anticipated response rate and the targeted number of respondents in each country. Each country aimed for at least 2,000 usable cases. Some countries – Spain, Italy, Switzerland, the Netherlands and the Czech Republic – increased the size of their sample to allow specific comparisons and analyses for national purposes that would not have otherwise been possible. Because of the relatively small annual number of graduates in Estonia, the whole population was approached in that country.

To increase the efficiency of the sample, stratified sampling was used. The strata used were dependent on the national context, but usually comprised type and field of higher education, and in some countries also region and gender. In some countries – France, Austria, Germany, the UK and Czech Republic – a two-stage sampling procedure was followed: first a sample of higher education (HE) institutes and in a second stage a random sample within these institutes. To allow meaningful comparison between institutions, no less than 20 and no more than 80 institutions were included per country. In total, graduates from around 570 HE institutions were approached. This amounted to an average of a little over 60 graduates per institution.

The mail questionnaire focuses on educational experiences before and during higher education, the transition to the labour market, characteristics of the first job, characteristics of the occupational and labour market career up to the present, characteristics of the current job, characteristics of the current organisation, assessment of required and acquired skills, evaluation of the educational program, work orientations and some socio-biographical information. The survey is complemented by a country study that identifies the main structural and institutional factors framing the transition from higher education to work, and a qualitative study that sheds light on the main developments in higher education and in the economy that affect the acquired and required competencies.

Higher education in most European countries is characterised by a certain degree of internal differentiation. Around the turn of the millennium, when most REFLEX respondents left higher education, several countries had a binary higher education system; for example, the Fachhochschule in the German-speaking countries or the HBO colleges in the Netherlands. In other countries such as France there was even more differentiation, with strong differences in prestige separating elite and mass programmes. Because it is essential to take into account differences in level of higher education, but not practical to report detailed results for each type in each country, in this report we draw a broad distinction between those higher education programmes that provide direct access to a PhD – referred to as second-level programmes, e.g. university master level programmes – and those programmes that do not provide direct access to a PhD – referred to as first-level programmes, e.g. bachelor programmes, programmes offered by Fachhochschulen. Table 1.1 contains an overview of the number of available respondents and the response percentage per country.

Table 1.1 makes clear that the number of respondents differs strongly between countries. To prevent certain countries from dominating the mean results across all countries, all descriptive analyses presented in this report are weighted to 2,000 cases for each country. The weighting coefficient used also corrects for over- or

Table 1.1 Number of respondents and response percentage per country

Country	Number of respondents			
	First level	Second level	Total	Response %
Norway	1,397	804	2,201	47
Finland	1,187	1,489	2,676	44
The United Kingdom	1,470	108	1,578	23
Germany	544	1,142	1,686	36
Austria	122	1,699	1,821	20
Switzerland	1,578	3,304	4,882	55
The Netherlands	2,291	1,134	3,425	35
Belgium-Flanders	403	871	1,274	22
France	1,053	599	1,652	29
Italy	255	2,884	3,139	30
Spain	1,566	2,346	3,912	22
The Czech Republic	1,177	5,586	6,763	24
Estonia	820	139	959	18
Total	13,863	22,105	35,968	29

underrepresentation of certain levels or fields of higher education compared to population figures. Multivariate analyses use unweighted data, whereby a random sample of no more than 2,000 cases per country has been drawn.

More detailed reports on the research design and data collection can be downloaded from the project website (www.reflexproject.org).

1.5 Structure of the Report

Chapter 2 provides a brief overview of the theoretical underpinnings of the REFLEX project and describes some of the key findings. Attention is paid to the demands made of graduates and the extent to which they are prepared by higher education to meet these demands. Five domains are identified in which graduates are thought to be faced with particularly high demands: professional expertise, functional flexibility, innovation and knowledge management, mobilisation of human resources and international orientation. As well as describing the extent to which graduates experience a shortage or a surplus of competences in these domains, we pay attention to competences that are considered specifically weak or strong points of the higher education program. We look at national differences in the way in which higher education is organised and explore the role of higher education in equipping graduates with the competences they need to meet the five demands. We also look at the extent to which higher education provides a good basis for participation in the labour market, for career and personal development and for the development of entrepreneurial skills, and examine how program characteristics are related to graduates evaluations of these aspects.

In the following chapters we explore the five demands in more detail. Because it is not possible in a single report to deal with every facet of these demands, in each chapter we focus on a particular theme related to the demand in question which is of particular interest to scholars and policy-makers. In Chapter 3, we explore the demand for professional expertise by looking at the different ways in which graduates can be called on to play the role of professional experts. Five types of professions are identified, which turn out to be quite distinctive, not only in terms of the competence profile required, but also in terms of personal background, educational career, labour market position and the specificity of the match between higher education and work. Attention is also paid to the amount of additional training that is needed to become an expert in the graduates' chosen own area of work after leaving higher education. The chapter goes on to describe the competences that are typically required in the different types of profession, and the extent to which graduates possess these competences. The chapter also provides a description of the strong differences that exist between the different types of professions in the manner in which the professional role is defined, the aspects of work that their incumbents find important, the earnings received and selected background and educational characteristics.

Chapter 4 explores the demand for functional flexibility by looking at the changes in graduates' work environment, more specifically changes in the labour market and on the work floor, that are driving this demand. Looking first at changes in the labour market, the chapter describes differences in job security offered by graduates' work contracts and at actual job mobility in the first five years. Attention is paid to the extent to which job mobility is associated with unemployment spells or changes in occupation and/or economic sector. The consequences of job mobility in terms of competence development and job satisfaction are also investigated, as are the factors associated with the chance of having a temporary contract five years after graduation. Turning to changes on the work floor, a description is given of the extent to which graduates are exposed to changes in work tasks, and other features of the organisation or its environment that affect this are described. In addition, the chapter seeks to identify competences that are especially important to graduates who are faced with changes in their work tasks, and to establish whether higher education has provided these competences to a sufficient extent. Finally, the authors looked at characteristics of the study programme that were more important as determinants of the extent to which graduates felt that their study programme was a good preparation for current work tasks.

Chapter 5 is concerned with innovation and knowledge management, and in particular with the role played by higher education graduates in the knowledge and innovation society, and how this varies with characteristics of work organisations and their environment. The relationship with aspects of organisations or their context that are known to be related to existing measures, such as competition, scope of operations, organisation size and economic sector are described, and the ranking of countries according to REFLEX is compared to that based on the index developed for the European Innovation Scoreboard 2006. After describing the extent to which the organisations in which graduates work are oriented towards innovation, the role that the graduates themselves play in introducing these innovations is examined. The authors look for competences and features of higher education or

the work organisation and/or context that are related to a stronger role in introducing innovations.

Chapter 6 looks at the role graduates play in the mobilisation of human resources. A distinction is drawn between graduates' mobilisation of their own capabilities and their role in mobilising the capacities of others working in the same organisation. The chapter starts with an analysis of the mobilisation of graduates' own capacities during higher education, in terms of study hours, effort and extracurricular experiences. Attention is subsequently paid to an analysis of the development of competences which are thought to be particularly relevant to mobilising human resources, and the features of higher education that contribute especially to this. After this, several indicators are described that are thought to be relevant to mobilisation of one's own and/or others' capacities at work, and the effects of competences, higher education characteristics and experiences, and work and organisation characteristics on such mobilisation are estimated.

Chapter 7 examines the increasing demand for international orientation by exploring international dimensions of higher education and graduate employment. Attention is paid to mobility over the life course: the country of origin and the country of residence at different life stages, and time spent abroad during and/or after higher education for study and/or work. The relation is examined between international mobility during higher education on one hand and graduates' transition from study to work and early career development on the other. In addition, the relation between international mobility and selected background characteristics, competences and features of higher education and work are examined.

Following the chapters dealing specifically with the five demands, Chapter 8 looks at both objective and subjective determinants of success and failure in the labour market. The indicators of objective success or failure are the employment situation – have graduates managed to secure paid work, and if so does this match their own attained level and field of higher education? – and the wages earned. In addition to describing differences in these outcomes by country, field and level of higher education, the authors identify background characteristics, features of higher education and features of the transition and early career that are related to these outcomes. The subjective measures concern work values and the realisation of these values, and job satisfaction. Using factor analysis, three types of work orientations are distinguished, and "winners" and "losers" on each of these dimensions are identified. As for the objective outcomes, the authors look for background characteristics, features of higher education and features of the transition and early career that are related to these outcomes. They also look at the effects of objective outcomes on the chances of being a winner or a loser on the subjective dimensions.

Finally, Chapter 9 looks at the main conclusions and policy implications that can be derived from the report. By highlighting and drawing connections between some of the key outcomes in the preceding chapters, some general conclusions are drawn about the higher education experiences and labour market outcomes of graduates in the participating countries. Subsequently, several policy implications were identified which were thought to be relevant to one or more of following stakeholders: the European commission, national governments, employers, higher education institutions and students.

Appendix: First- and Second-Level Programmes per Country

	First level	Second level
Italy	Diploma universitario	Laurea
Spain	Diplomatura	Licenciatura
France	Licence	DEA
	Maîtrise	DESS
	Diplôme d'école spécialisée (santé, art, architecture, journalisme, infirmier, etc.)	Diplôme d'école d'ingénieurs Diplôme d'école supérieure de commerce Certificat de la fonction publique (ex: CAPES, etc.) Diplôme d'Etat de docteur en médecine, pharmacie ou odontolo
Austria	Mag./Mag.a oder Dipl.Ing./Dipl.Ing.in (FHS)	Mag./Mag.a oder Dipl.Ing./Dipl.Ing.in (Univ.) Dr./Dr.in
Germany	Diplom Fachhochschule, Diplom I an Gesamthochschule	Diplom Universität, Diplom II an Gesamthochschule Magister
	Bachelor	LA Grund- und Hauptschulen LA Realschulen LA Gymnasien LA Sonderschulen LA Berufliche Schule LA Sontiges Sonstiges Staatsexamen Kirchlicher Abschluss Künstlerischer/musischer Abschluss Master
The Netherlands	HBO	WO doctoraal (drs., mr. of ir.) WO opleiding tot basisarts, tandarts of apotheker
The United Kingdom	Bachelor	Master
Finland	AMK-tutkinto	Masterintutkinto tai vastaava
Norway	3–4 års hogskoleutdanning	Hovedfag/høyere grads embetseksamen
The Czech Republic	Bachelor	Master
Switzerland	Masters Fachhochschule	Masters University
Belgium-Flanders	Hoger onderwijs van cycli (lange type)	Universitair onderwijs – licentiaat of ingenieur Universitair onderwijs – arts
Estonia	Bakalaureuseõpe	Arsti-, hambaarstiõpe
	Rakenduskõrgkooli ja ülikooli diplomiõpe	Integreeritud õpe (proviisor, loomaarst jne.) Kõrghar. eeldav -a. õpetajakoolitus, interniõpe Magistriõpe, kutsemagister Magistriõpe, teadusmagister

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Chapter 2
The Flexible Professional in the Knowledge Society: Required Competences and the Role of Higher Education

Rolf van der Velden and Jim Allen

2.1 Introduction

Higher education policy has increasingly gained a European dimension with its own distinct influence over national education policies. It is clear that the Bologna declaration and the subsequent initiatives have put higher education in the centre of EU policy with the goal to create a "Europe of knowledge". The EU's stated strategic goal for the next decade is "to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion" (European Commission, 2000). Universities play a vital role in this Europe of knowledge, as the recent communication of the Commission has made clear (European Commission, 2003). In this chapter we will explore this role of universities more closely by looking at the extent to which higher education produces the competences that are needed in the modern knowledge society.

This chapter is organised as follows. In Section 2.2 we will explore the demands from the world of work: What are the major trends and demands that can be distinguished from the literature? Can we find evidence for these demands when we look at the required competences in the jobs that graduates hold? Are there any differences between countries? Are graduates well prepared to face these demands or do they experience shortages? Conversely, are there indications that some of these competences are being underutilised? And finally, which competences are considered specifically weak or strong points of the higher education programme?

In Section 2.3 we turn to the role of higher education in equipping graduates with these competences. What are the main dimensions along which higher education programmes can vary, and to what extent do differences between countries occur in these dimensions? How do graduates differ in their reported study behaviour, or in the experiences gained during their time in higher education?

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In Section 2.4 we look at the effects of programme characteristics, study behaviour and experiences on competence development.

Section 2.5 looks at the extent to which higher education provides a good basis for participation in the labour market, career and personal development and entrepreneurial skills, and at how programme characteristics are related to graduates evaluations of these aspects. We also look at the effects of competences and higher education characteristics on a selected number of labour market outcomes.

2.2 The Demands from the World of Work

2.2.1 Operationalisation of the Demands

In Chapter 1 we described three trends that affect the demands that higher education graduates face: the move towards a *knowledge society,* the *transitional labour market* and the increasing *internationalisation* and *globalisation* of product markets and labour markets. These trends are expected to give rise to increasing demands for competences in the areas of *professional expertise*, *functional flexibility*, *innovation and knowledge management*, *mobilisation of human resources* and *international orientation*.

Do we find any empirical evidence that these competences are really in demand in the labour market? In the survey, respondents were shown a list of 19 competence items and asked to indicate to what extent these competences were required in their current job and to what extent graduates actually possess them. Graduates were asked to indicate both the required level and their own level on these competences using the same seven-point scale ranging from 1 (very low) to 7 (very high). We use 17 of these items as indicators of the five demands described above.[1] The relation between most of the items and the associated demand is self-evident, but in a few cases some explanation may be required. As indicated above, the demands are not mutually exclusive and some items could be grouped under multiple headings. For example, "analytical thinking" is an essential component of professional expertise, since it underpins the ability of an expert to use his or her knowledge and skills to diagnose and solve complex problems in their own area of work, but is likely to play a role as well in innovation and knowledge management and perhaps to a lesser extent even in functional flexibility and mobilisation of human resources. Similarly, the "ability to assert your authority" is seen as an expression of the required ability of professional experts to command authority and act decisively in uncertain situations,

[1] For international orientation, only one indicator was included in the questionnaire, related to foreign language proficiency. Although this is likely in most cases to be a prerequisite for international orientation, it is clear that this demand is in reality broader, including such things as cultural awareness and knowledge of other countries. To avoid misinterpretation, we will refer when discussing results to foreign language skills rather than international orientation. In addition to the 17 competences that have been used to indicate the five demands, graduates were asked to rate their required proficiency in two other areas not directly related to these demands, namely the ability to present products ideas or reports to an audience and the ability to write reports, memos or documents.

but is clearly also related to mobilisation of human resources. "Ability to negotiate effectively" is put under the heading of functional flexibility as it is expected to be a key factor enabling graduates to make better use of their existing skills when faced with changes in their environment, but this competence is likely to also be related to mobilisation of human resources.

To get an idea of the internal consistency of the underlying indicators of each demand, Table 2.1 shows the Cronbach's alpha for the different scales. This coefficient reflects the correlation between the different items. The scales on innovation and knowledge management and mobilisation of human resources are quite reliable (alpha 0.76 and 0.83 respectively). However, the scales for professional expertise and functional flexibility show low reliabilities (0.52 and 0.59 respectively). Since we only have one indicator for international orientation, namely the ability to write and speak in a foreign language, no scale could be formed for this demand.

As Table 2.2 makes clear, the basic pattern in terms of scalability is repeated across all countries, with weak scales on the first two demands and moderate to strong scales on the last two demands. As the last column of Table 2.1 makes clear, it is not possible to improve the scalability of these two (or for that matter any) scales by dropping items. It might be feasible to achieve better scales by rearranging the mix of items in each scale, but this would blur the theoretical meaning of the scales and create difficulties for the interpretation of the results. We therefore decided to retain these two scales as they are. We use the average scores on the underlying items as an indicator of each demand.

Table 2.1 Cronbach's alpha per demand

Items per demand	Cronbach's alpha	Cronbach's alpha if item deleted
Professional expertise	0.52	
Mastery of your own field or discipline		0.37
Analytical thinking		0.36
Ability to assert your authority		0.55
Functional flexibility	0.59	
Knowledge of other fields or disciplines		0.49
Ability to rapidly acquire new knowledge		0.46
Ability to negotiate effectively		0.54
Innovation and knowledge management	0.76	
Ability to use computers and the internet		0.77
Ability to come up with new ideas and solutions		0.63
Willingness to question your own and others' ideas		0.67
Alertness to new opportunities		0.74
Mobilisation of human resources	0.83	
Ability to perform well under pressure		0.82
Ability to use time efficiently		0.80
Ability to work productively with others		0.79
Ability to mobilise the capacities of others		0.80
Ability to make your meaning clear to others		0.81
Ability to coordinate activities		0.79

Table 2.2 Cronbach's alpha per demand per country

	Professional expertise	Functional flexibility	Innovation and knowledge management	Mobilisation of human resources
ES	0.63	0.61	0.77	0.84
IT	0.57	0.54	0.72	0.81
FR	0.58	0.57	0.75	0.81
CH	0.43	0.53	0.75	0.81
AT	0.38	0.54	0.74	0.79
DE	0.41	0.51	0.78	0.80
NL	0.58	0.63	0.80	0.85
BE	0.43	0.53	0.76	0.84
UK	0.58	0.63	0.80	0.85
NO	0.46	0.58	0.79	0.85
FI	0.53	0.63	0.79	0.86
EE	0.62	0.62	0.76	0.87
CZ	0.53	0.59	0.75	0.82

In the next section we aim to answer the question of the extent to which the five demands are actually observed in the labour market, by looking at the average required level of competences representing each demand. Following that we will look at the degree to which required level matches the level actually possessed by graduates.

2.2.2 Required Level

Figure 2.1 displays the required level for the five demands in each country for graduates who are currently working.

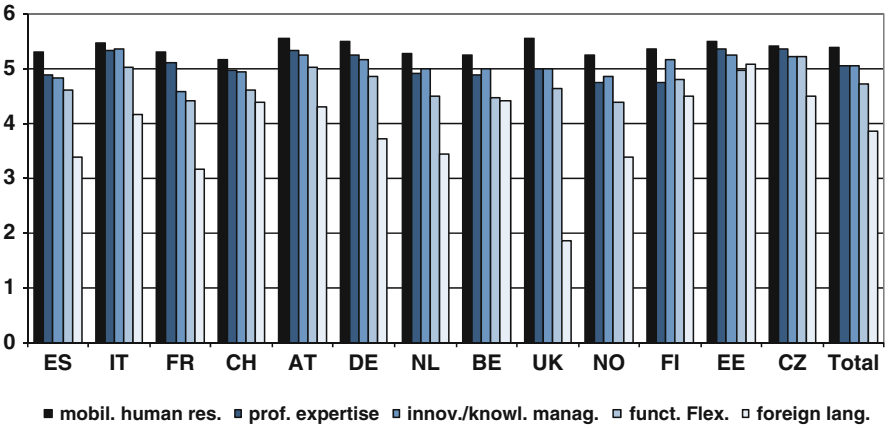

Fig. 2.1 Mean required level of competence per demand

To make Fig. 2.1 easier to read, the demands have been sorted in descending order of mean level required across all countries. As a general conclusion we can say that in all countries graduates are confronted with relatively high levels of required competences for each of the first four demands. The required level is highest for mobilisation of human resources (average 5.4 across all countries; also the highest for each country individually). The required level of both professional expertise and innovation and knowledge management is around 5.1 across all countries, and in most countries the required level of these two dimensions is also roughly the same. The demand for functional flexibility is a little lower (4.7), but by far the lowest level of demand is for foreign language skills (3.9). With a few exceptions, the differences between countries are quite small. Estonia scores relatively high on all five demands, even foreign language skills. This also applies to Italy, Austria and the Czech Republic, although in those countries the required level of foreign language skills is clearly lower than that of the other four dimensions. France scores relatively low on functional flexibility, innovation and knowledge management and especially foreign language skills. Norway and Finland have relatively low scores on professional expertise and Norway, Belgium-Flanders and the Netherlands score relatively low on functional flexibility. Not surprisingly, by far the lowest required level of foreign language skills is seen in the UK.

2.2.3 Shortages and Surpluses

To what extent are graduates able to meet these demands? Are there any serious shortages in terms of the competences that graduates have acquired? Are there areas in which graduates are in fact over-equipped for the labour market, with an own level higher than that required by their employers? Because the graduates were asked to report their own level as well as the level required, and because these are measured using the same scale, it is possible to identify shortages and surpluses for each competence. Figure 2.2 displays the average percentage across the underlying competences associated with each demand of graduates reporting a competence level that falls short of the required level in their job (shortage), or that exceeds the required level in their job (surplus).[2]

Overall, not many graduates claim that they have a shortage in their competence level for any of the five demands. The overall percentage of graduates indicating that they experience a shortage ranges from only 7% in the case of innovation and knowledge management to around 11% for professional expertise and foreign language

[2]To avoid placing too much weight on small discrepancies, in order to be identified as a shortage or a surplus, there must be a difference of at least two points between required and acquired level. For example, a graduate who reported a required level of six points on the seven point scale, but who reported that his/her own level was five, would not be identified as having a shortage of this competence. However, if the graduate's own level was only four, we would identify this as being a shortage when compared with the required level of six. Similarly, when the graduate's own level is six but the required level is only four, we would identify this as a surplus.

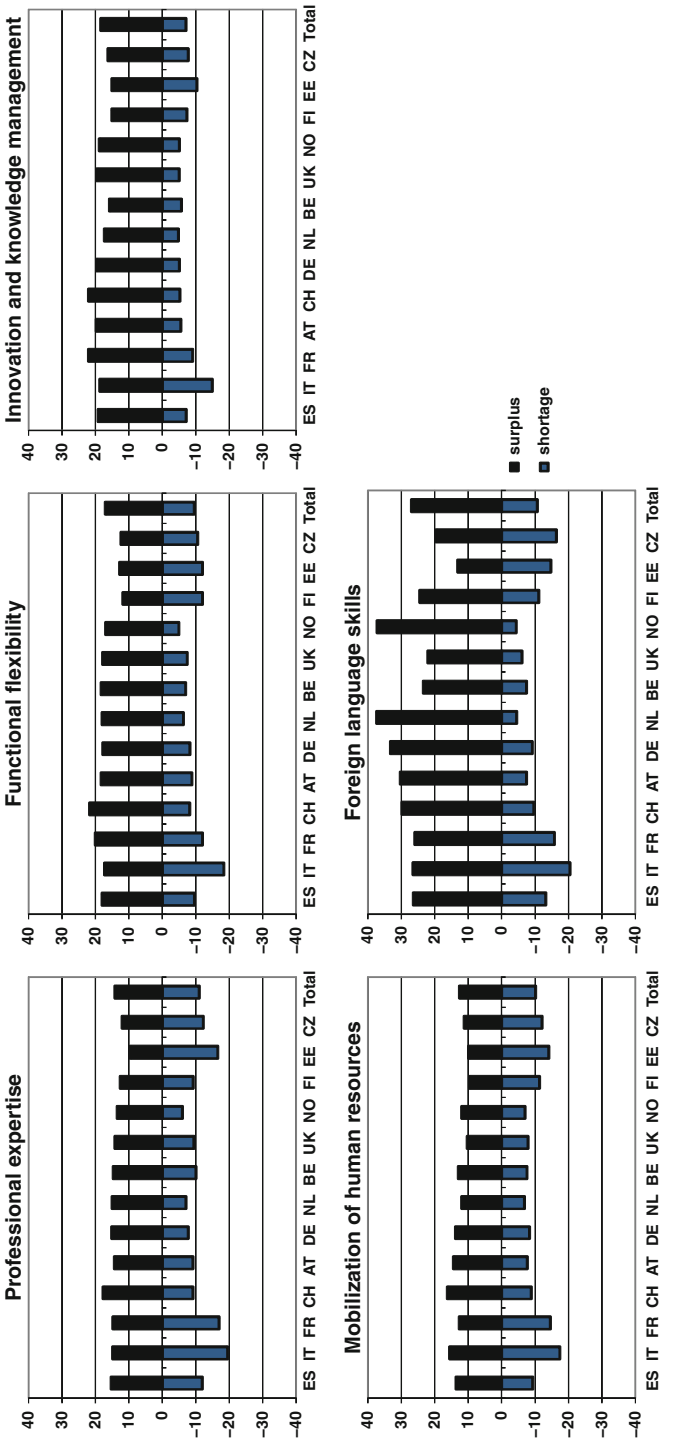

Fig. 2.2 Shortages and surpluses of competence per demand

skills. This means that most graduates consider themselves quite well equipped to do the job they hold. The proportion of graduates reporting a surplus is clearly higher, and varies much more across the five demands. The domains in which graduates are least likely to experience a surplus are professional expertise and mobilisation of human resources, both of which shows a surplus of around 13–14%. The problem of surplus is greater for the domains functional flexibility and innovation and knowledge management (17–18%), but is really quite severe for foreign language skills (27%). In this domain well over a quarter of graduates reports a serious surplus. It is worth noting that this was, together with professional expertise, one of the domains where the greatest shortages are seen. This indicates that there is no perfect trade-off between shortages and surpluses, and that sometimes a large group of graduates can experience a shortage in a certain domain while a different group experiences a surplus.[3]

There are some important differences between countries in both shortages and surpluses. In Italy a relatively high share of graduates reports shortages in each domain. Contrary to what we might expect, this does not mean that Italian graduates rarely experience a surplus of competences. In fact, in all five domains, the percentage or graduates reporting a surplus is at least as high or even higher than the overall average across countries. This suggests that in that country it may not be so much a problem of insufficient levels of competence in the aggregate, but rather that the competences are not well allocated across jobs. Conversely, Norwegian and Dutch graduates perceive low levels of shortage in each domain, which only in the domain of foreign language skills is accompanied by relatively high levels of surplus. Swiss graduates experience relatively high levels of surplus in all domains, while the opposite is true of Estonian graduates.

2.2.4 Strong and Weak Points

The fact that graduates experience shortages and/or surpluses in certain domains need not mean that higher education has failed in its mission. Graduates may feel that certain competences are better developed outside of higher education, while other competences may need to be constantly renewed in order to remain up to date. We now turn to the competence domains that graduates regard as relatively strong or weak points of their higher education programme. We asked the graduates to name a maximum of 3 competences that they considered to be strong points of their study programme and also a maximum of 3 competences that they considered to be

[3] In theory, such mismatches could be reduced by reallocating graduates across jobs, so that graduates currently underutilizing certain competences swap jobs with workers who experience a shortage of the same skills. In practice, this is problematic, for the simple reason that graduates represent indivisible "packages" of competences. Swapping jobs might eliminate mismatches within a single domain, but are likely to create new mismatches in other domains that are as bad or worse than the original mismatch.

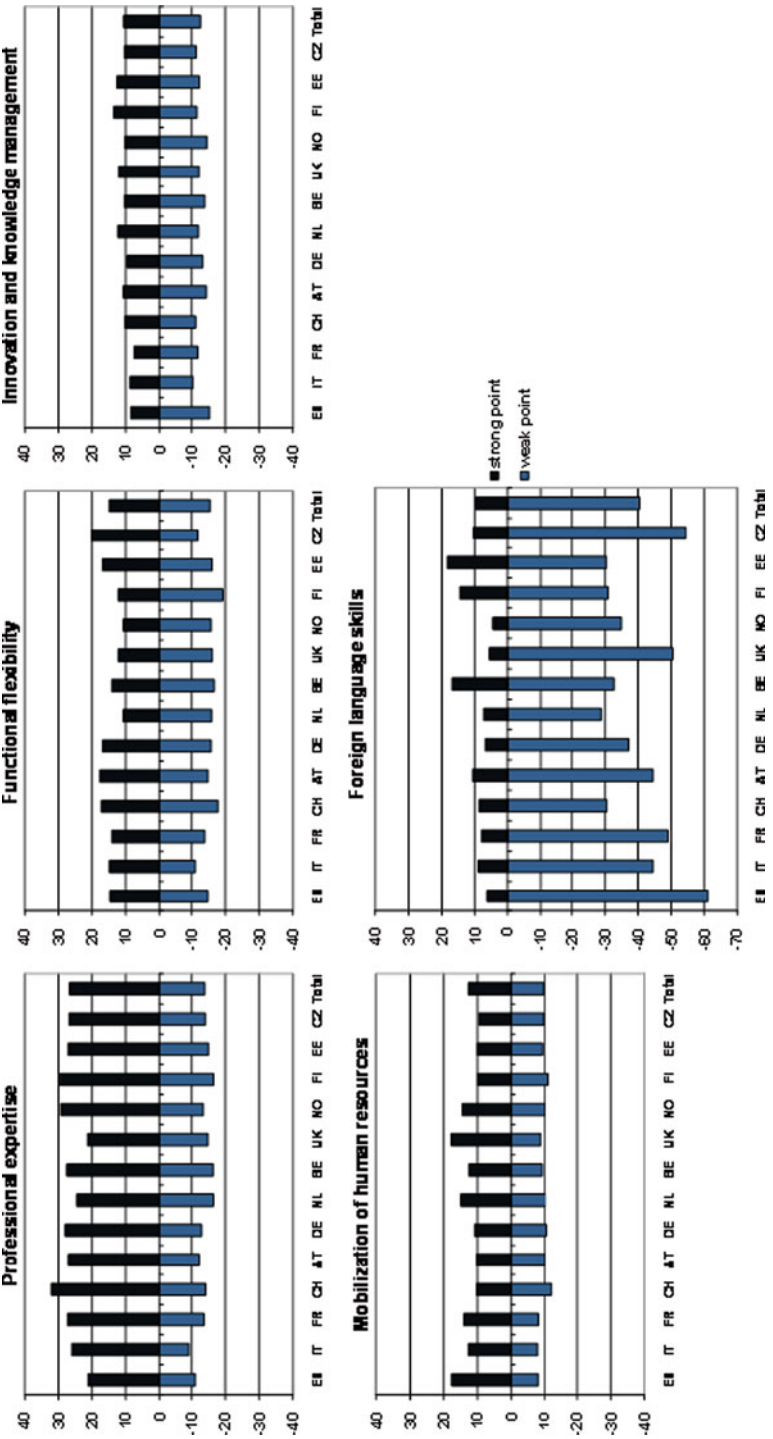

Fig. 2.3 Strong and weak points of the study programme per demand

weak points. Figure 2.3 displays the average percentage across the underlying competences associated with each demand of graduates reporting that the competence was respectively a strong point or a weak point of the study programme.

The domain that is most often regarded by graduates in all countries as a strong point of higher education is that of professional expertise. On average around a quarter of all graduates reported the competences associated with this demand were regarded as a strong point of their study programme. In contrast only around one in ten graduates reported that innovation and knowledge management or foreign language skills was a strong point. The latter domain was most often poorly regarded, with more than four out of every ten graduates naming this as a weak point. Few graduates singled out the competences in the domains of innovation and knowledge management or mobilisation of human resources as either strong or weak points.

Although the general pattern is largely repeated for each country separately, there are some interesting differences. Graduates in the Czech Republic held a relatively favourable view of their programme in terms of functional flexibility. Spanish graduates were relatively positive in their assessment of their programme in terms of mobilisation of human resources, but were quite negative in their assessment in terms of innovation and knowledge management. Despite showing few shortages in terms of professional expertise, Dutch graduates were quite negative in their assessment of their study programme in this domain. Interestingly, a relatively high percentage of Finnish graduates regarded competences in this domain both a weak point and a strong point, reinforcing the impression that this is a highly salient dimension in terms of how graduates view their programme. UK graduates were less than impressed with their programme in terms of foreign language skills.

2.3 On the Role of Higher Education in Preparing Graduates for the Labour Market

2.3.1 Complex Demands on Higher Education

Graduates' ability to meet the demands that the knowledge society makes of them depends in no small part on the competences that they develop through higher education. However, higher education policymakers face demands that are just as complex as those facing graduates. They have to consider how higher education can be designed so as to equip graduates with the competences needed for successful performance in the knowledge society, or at least to lay the foundation for acquiring these competences through work experience. In doing so, how do they strike a balance between the sometimes apparently contradictory demands made of graduates, such as the need for specialised knowledge and flexibility? How do they decide between investing in the competences of the best and brightest, and making higher education more accessible to a broad range of young people? Although this may seem like an "either/or" decision, most higher education policies have in fact adopted a strategy in which they develop specialised knowledge *and* flexibility and

embraced a policy that furthers inclusiveness *and* selectivity. But what further measures do they need to take to ensure that graduates quickly find their way in the world of work, for example by forging links with employers and employer organisations, by encouraging the direct acquisition of work experience during higher education or by taking steps to improve the transparency and acceptance of higher education qualifications by employers? Finally, given that education systems are each embedded within their own national constellation of institutions, laws, customs and so on, how quickly can they adjust to the essentially global challenges of the knowledge society?

2.3.2 Different Solutions

There is strong evidence that higher education policymakers are well aware of the challenges they face. However, so far there is little evidence that this has led to an integrated view of the part higher education is required to play in the knowledge society. There rather seem to be competing perceptions of the problem. Notions of "super-complexity" in society and economy (e.g. Barnett, 2000) suggest greater divisions of labour and a further fragmentation of academic disciplines in the university (Clark, 1996). On the other hand, notions of "flexibility" in professional life suggest greater emphasis on generic "transferable" skills in the workplace and interdisciplinarity and integration in the university (Mason, 2001). This tension can be resolved to some extent by offering a mix of specialised and more general programmes. It is, however, noticeable that different countries arrive at distinctly different mixes, and that the relative merits of further specialisation and greater flexibility are still the subject of considerable discussion in most countries.

2.3.3 Different Theoretical Approaches

The test of whether higher education is up to the challenges posed by the knowledge society will lie in the actual educational practices employed, and the concrete results achieved. The changing demands for graduate competences in the knowledge society is reflected in the development of educational theories on instruction and learning outcomes at the level of individual study programmes. Recent research suggests that there is a strong relation between the development of competences and particular characteristics of the learning environment (Vaatstra & De Vries, 2003). It would go too far to fully discuss all educational theories on instruction and learning outcomes, but we can note a number of recent developments:

- *Situated learning* theories (CTGV, 1990; Glaser, 1991) emphasise that competences and competence development are context-specific. They stress the importance of coherence and context-relevance (e.g. real life experiments, simulation

and practical work experience) in the design of the curricula in order to develop professional expertise.

- *Self regulated learning* theories point to the relevance of meta-cognitive abilities and information processing strategies of students (Kolb, 1984; Vermunt, 1992). Learning styles differ between students ranging from a memorising and rather atomistic way of learning towards a more constructivist approach in which concepts and theories are actively incorporated in a coherent body of knowledge. An interesting finding in this respect is that the way examinations are organised may foster a different learning style than the curriculum actually intended (Semeijn & van der Velden, 2002): for example, multiple choice exams foster different competences than the writing of essays, although the actual curriculum may be quite the same.
- *Active learning* theories reject the traditional naïve model of the teacher as the expert, filling so to say the brains of the students with his knowledge. "Powerful learning environments" (De Corte, 1990) and active instructional methods like problem-based learning and project-oriented education are thought to foster the development of generic competences like problem solving and meta-cognitive abilities.

In addition to these innovative ways of learning based on elaborate theories on how individuals actually learn, educational research has traditionally stressed "time on task" as one of the most important factors affecting student outcomes. That is, the actual time students spent on education (within the class-room and through self-study) is a good predictor of the learning outcomes net of other characteristics such as intelligence.[4] Other aspects of education that may help prepare graduates to meet the demands of the world of work include the following:

- *Complementarity between education and research*: it might make a big difference whether graduates study at an institution with many leading experts in their research field, and if so to what extent they have become involved in research during their study. Much is expected of universities as motors of innovation. It is important to see to what extent this "rubs off" on graduates, in the form of higher levels of innovative competences.
- *International focus* of education: there has been a large increase in recent years in the emphasis placed on the acquisition of international experience, in the form of exchange programmes, internships in foreign companies and the like. Obviously this increases the foreign language skills of the students, but it may affect other areas of competence as well.

The REFLEX survey contains a number of indicators that can shed light on the abovementioned characteristics. For example, to examine the importance of situated

[4] As Thomas Edison famously claimed, genius is 1% inspiration and 99% perspiration.

learning in higher education, we have at our disposal indicators of various kinds of experience gained by students, both as part of the formal curriculum and as activities undertaken in students' own time. This includes time students have spent abroad during higher education for study or work. Active learning theories can be examined by making use of indicators of problem-based learning and other modes of teaching that involve a greater or lesser input on the part of students. A number of indicators reflect on the extent to which higher education programmes are anchored in the world of work. There are indicators of student effort, including both objective and subjective indicators, as well as indicators of the mode of assessment used.

Below we describe these actual characteristics and experiences reported by graduates with respect to their time spent in higher education. We start with a brief description of some key characteristics of their study programme. Subsequently, we describe the modes of teaching and learning that were applied. Following this, we look at the study behaviour and motivation reported by graduates, as well as the extracurricular experiences gained while enrolled in higher education.

2.3.4 Programme Characteristics

In the survey, graduates were asked to characterise their study on the basis of a number of statements. For each of these statements, the respondents could indicate to which extent these statements applied to their study programme on a 5-point scale ranging from 1 (Not at all) to 5 (To a very high extent). In order to paint a picture of the main similarities and differences between countries, we have grouped the statements into pairs that are in some way related. We start in Fig. 2.4, which gives an overview of the average responses in each of the countries to the statements:

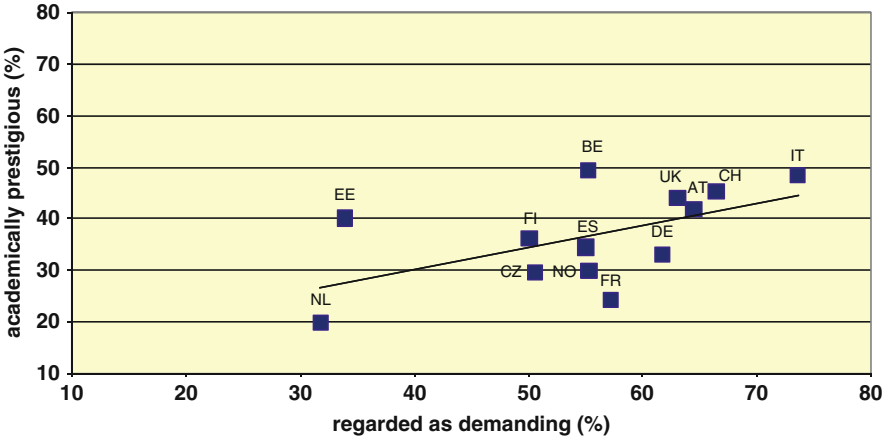

Fig. 2.4 Percentage of graduates who reported that the study programme was generally regarded as demanding and percentage of graduates who reported that the study programme was academically prestigious, by country

"The programme was generally regarded as demanding" and "The programme was academically prestigious". We report the percentage of graduates who answered 4 or 5 on the 5-point scale.

In most of the countries a majority of between 50 and 70% of the graduates indicate that their programme was regarded as demanding. Exceptions are the Netherlands and Estonia, where only between 30 and 35% of graduates indicate that this was the case. Although there is some relation between demandingness and prestige, the two characteristics are by no means the same. First of all only a minority of between 20 and 50% indicate that their programme was regarded as prestigious, where the majority indicated that it was demanding. This indicates that demandingness is in any case not a sufficient condition for prestige. Second, the relation is far from perfect. In Belgium around half of all graduates reported that their programme was prestigious, compared to only around a quarter of French graduates, who scored about the same on demandingness.

Figure 2.5 displays the relation between the vocational orientation of the study programme and the extent to which employers are familiar with its content. One might expect that these two dimensions would be strongly related, since higher education systems with a strong vocational orientation are often thought to promote strong links between higher education and employers. Interestingly, there is only a moderate relation between the two characteristics at the aggregate level of countries. Although there is a large variation between countries in the extent to which graduates reported the programme was vocationally oriented, this variation is only accompanied by modest variation in the extent to which they reported the employers were familiar with the content. Only between 30 and 40% of the graduates of graduates in most countries indicate that the employers are familiar with the content. An exception is formed by Norway with over 60%. By contrast, the vocational

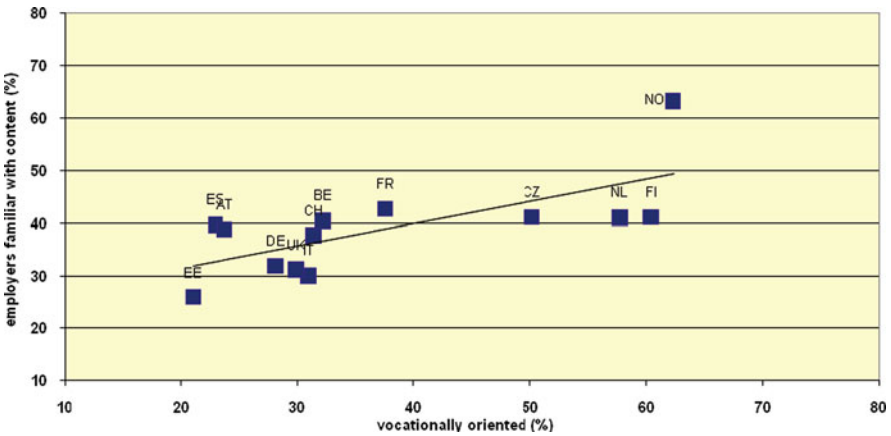

Fig. 2.5 Percentage of graduates who reported that the study programme was vocationally oriented and percentage of graduates who reported that employers were familiar with the content of the study programme, by country

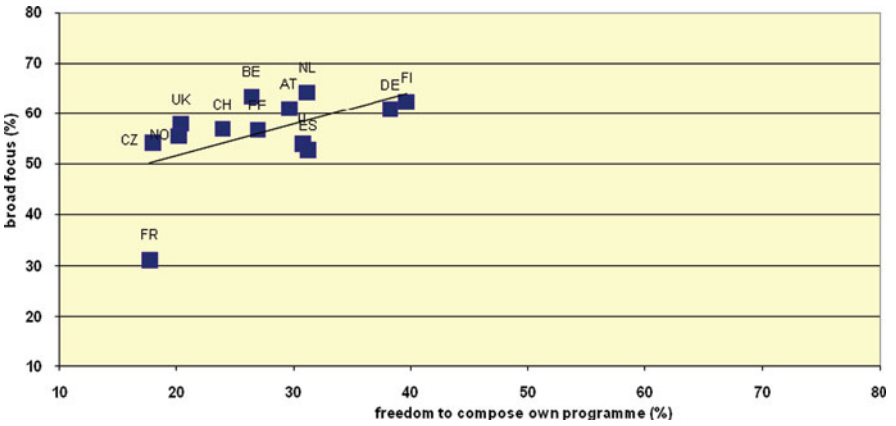

Fig. 2.6 Percentage of graduates who reported that there was freedom to compose one's own study programme and percentage of graduates who reported that the study programme had a broad focus, by country

orientation of higher education programmes ranges from 20% in Estonia to over 60% in Norway, with countries distributed across this full range. It is interesting to note that educational systems that are often thought of as vocationally oriented, such as Germany, Austria and Switzerland, are actually at the lower end of the distribution on this dimension. This may have to do with the fact that the Fachhochschulen in these countries actually constitute only a small proportion in higher education. By contrast, in countries like the Netherlands, Norway and Finland the vocational colleges constitute a large proportion of higher education, which is reflected in the fact that these countries end up in the upper end of the distribution.

Figure 2.6 shows the relation between the percentage of graduates reporting that there was freedom to compose one's own study programme and the percentage reporting that the study programme had a broad focus.

As one might expect, there is a clear relation between the two characteristics: more freedom is related to broader programmes. However, a broad focus clearly does not automatically equate to a high freedom of choice of subjects. In general the freedom to compose one's own programme is quite small in most of the countries and ranges from 10 to 40%. The average breadth of focus by contrast is much larger, although the variation is quite small. All countries except France score between 45 and 65% on this indicator.

2.3.5 Modes of Teaching and Learning

Apart from general characteristics of the study programme, graduates were asked to indicate to what extent different modes of teaching and learning were stressed during higher education. Again they could use a 5-point scale ranging from 1 (not at all) to 5 (to a very high extent), and again we present the percentage of

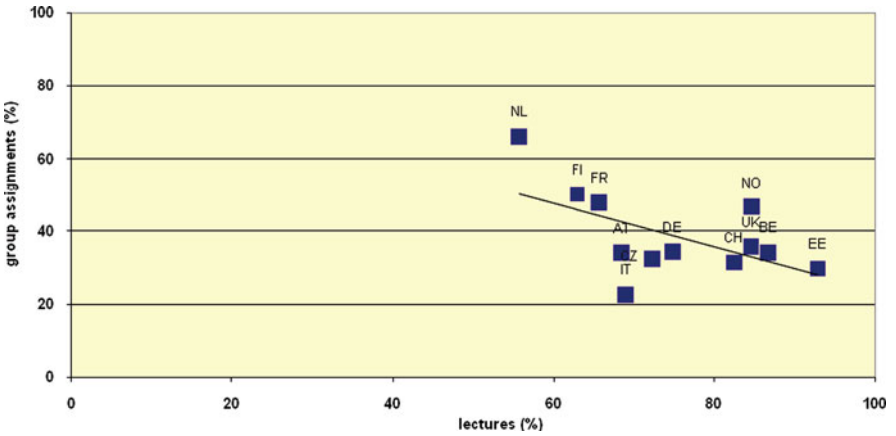

Fig. 2.7 Mode of teaching: Extent to which lectures versus group assignments were emphasised in the study programme, by country

graduates who answered 4 or 5 on the 5-point scale in scatterplots of related pairs of dimensions. First of all, Fig. 2.7 gives an overview of the extent to which lectures and group assignments were stressed. Despite the attention that has been paid in recent years to more group-based as opposed to individual learning, at the end of the last millennium lectures remained the most emphasised mode of learning across all countries. There is a clear though far from perfect negative relation between the extent to which lectures are emphasised and the extent to which group assignments are emphasised, with the Netherlands emerging as the country in which learning in groups is most strongly emphasised, and Estonia appearing as a country where lectures are the dominant form.

Related to the extent to which education takes place more in lecture or in group sessions is the extent to which the higher education programmes can be characterised as either teacher- or student-centred. Figure 2.8 displays this, based on the percentage of graduates who reported that the following items were emphasised: "Teacher was the main source of information" and "Project and problem-based learning".

As we would expect, there is a clear negative relation between these two aspects. In the countries where project- and problem-based learning plays a larger role, the teacher is less often regarded as the main source of information. There is a large variation in the extent to which the teacher is regarded as main source of information. This ranges from 25% for Norway to well over 60% for Spain and Belgium. The extent to which project- and problem-based learning is emphasised as a dominant mode of teaching is much lower, and ranges between 10 and 40%. In line with the previous results on lectures, this shows that at the end of the last millennium the higher education profiles in Europe were still very traditional and teacher-centred.

Apart from differences in teaching style, the higher education programmes in the different countries may of course also differ in content. A key dimension in this

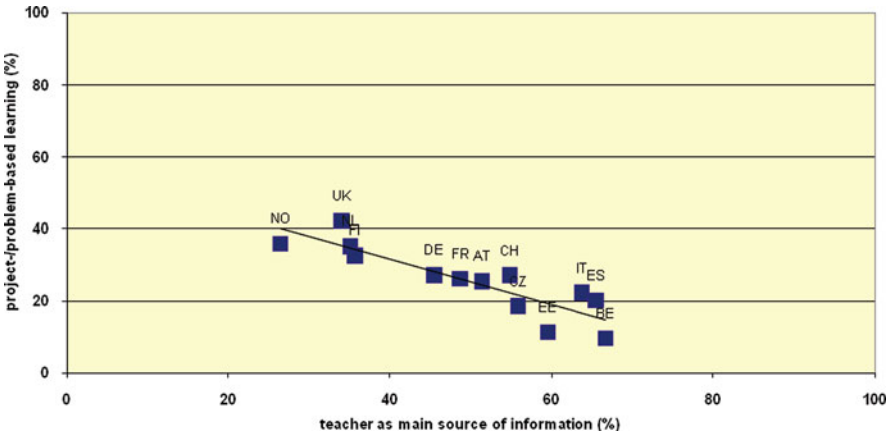

Fig. 2.8 Teacher- or student-centred: Extent to which the teacher as main source of information versus project- or problem-based learning was emphasised in the study programme, by country

respect is whether that content is mainly theoretical or practical. Figure 2.9 gives an overview of the extent to which theories and paradigms were emphasised versus the extent to which facts and practical knowledge were emphasised. As we would expect, we again note a clear negative relation between the two. Both dimensions show quite some variation, but countries differ more on the theoretical than the practical dimension, and most countries lean somewhat more towards the theoretical than the practical dimension. The Czech Republic emerges as a country where higher education is overwhelmingly theoretical, with very little emphasis on facts and practical knowledge. France and the Netherlands by contrast are much more practical than theoretical, although we should remark that even in these countries

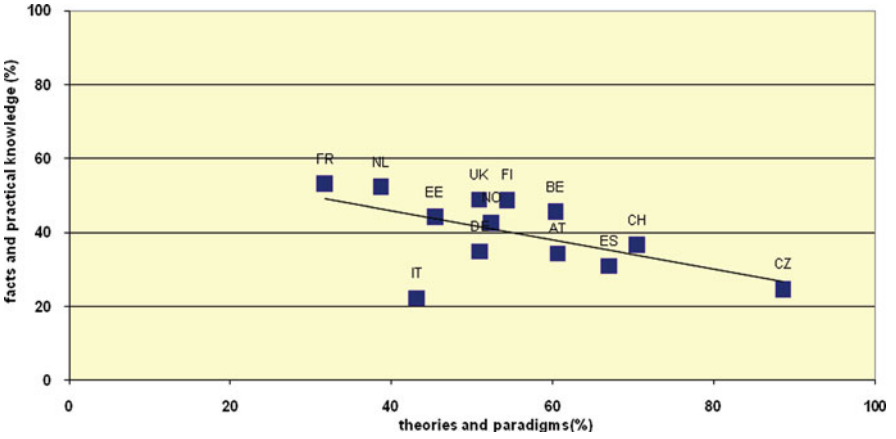

Fig. 2.9 Knowledge focus: Extent to which the theories and paradigms versus facts and practical knowledge were emphasised in the study programme, by country

some 30–40% of graduates reported a strong emphasis on theories and paradigms, and only a little more than half of all graduates reported a strong emphasis on facts and practical knowledge. Italy is unusual in that neither aspect was emphasised strongly.

There are various ways in which higher education institutes can provide students with hands-on experience to help prepare them for the world of work. The most common manner of imparting such experience is through work placements or internships, which form an integral part of many higher education programmes, especially those with a strong vocational orientation. However, universities also have a major research role, and part of that role is to train future researchers. For that reason, it is important for students who aim to pursue a career in research to have the opportunity to gain some experience in this area while still in education. Figure 2.10 shows there is a large variation between countries in the percentage of graduates having participated in work placements or internships. It ranges from less than 20% for the Czech Republic and Italy to 60% for the Netherlands. Some of the countries that scored high on vocational orientation also have high percentages of graduates who participated in a work placement or internship, particularly the Netherlands and Finland.

As Fig. 2.10 also makes clear, participation in research projects is relatively low in all countries, ranging from 5% in the Czech Republic to some 25% in the UK. There does not seem to be anything like a trade-off between these dimensions. In fact, if anything there is a weak positive relation.

What students learn is not only determined by the contents of the curriculum or the mode of teaching but also by the specific way of how they are assessed. Multiple choice exams foster a different way of learning than, for example, written assignments. The former is more focussed on learning by heart while the other is

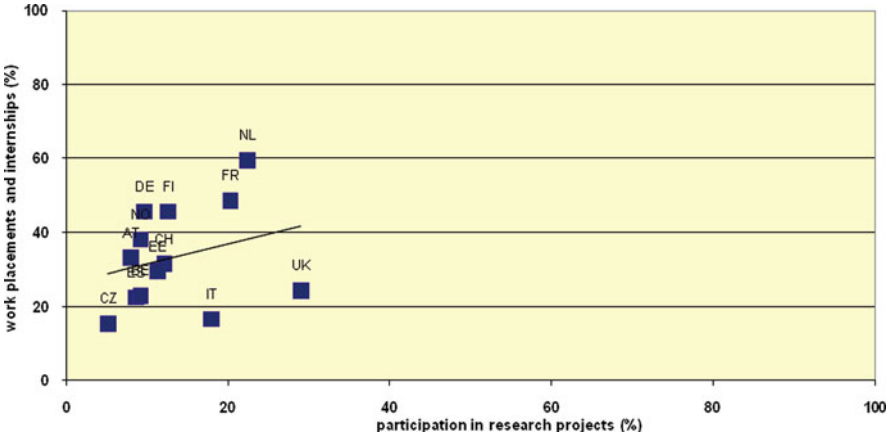

Fig. 2.10 Experience focus: Extent to which participation in research projects versus work placements or internships were emphasised in the study programme, by country

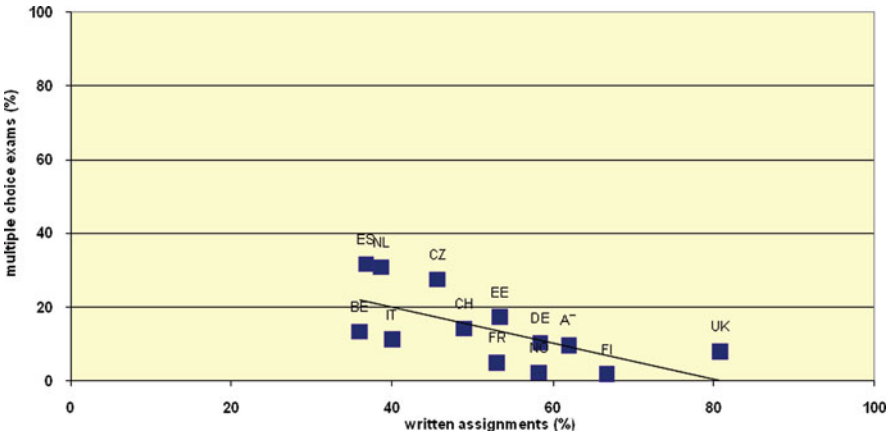

Fig. 2.11 Mode of assessment: Extent to which written assignments versus multiple choice exams were emphasised in the study programme, by country

more related to the acquisition of academic skills. Figure 2.11 gives an overview of the extent to which these modes of assessment were stressed.

Although written assignments were more strongly emphasised in all countries than multiple choice exams, there appears to be something of a trade-off between the two methods, in the sense that countries that stress written assignments less appear to fill this gap somewhat by using multiple choice exams more. Written assignments figure as the dominant way of assessment in the UK with over 80% of the graduates indicating that this mode of assessment was being emphasised. Spain and the Netherlands emerge as countries where the balance tips somewhat more towards multiple choice exams (although this method is still used less in these countries than written assignments). There are some exceptions to this pattern, with Belgium and Italy appearing as countries where neither seems very important.

Finally we look at the extent to which oral presentations were emphasised as a mode of assessment (Fig. 2.12). Oral presentations not only provide students with the opportunity to demonstrate what they have learnt during the programme, but can also help them to develop their communication skills. Again we can see quite some variation across countries, ranging from around 20% for Spain and Norway up to around 50% for the Netherlands and Italy.

2.3.6 Study Behaviour

From the survey we obtained three indicators of study behaviour of graduates during the higher education programme. The first indicator, mean study hours per week, can be seen as an objective indicator of study behaviour. The other two are more subjective indicators. Graduates were asked to indicate to what extent two statements applied to their study behaviour. The first statement was “I did extra work above

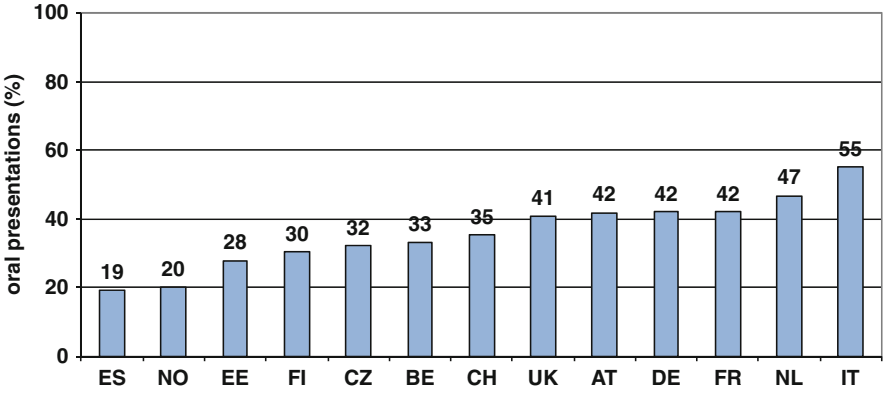

Fig. 2.12 Extent to which oral presentations by students were emphasised in the study programme, by country

what was required to pass my exams". This can be seen as an indicator of intrinsic study motivation. The second statement was "I strived for the highest possible marks", which can be seen as an indicator of extrinsic study motivation. Both questions could be answered on a 5-point scale ranging from 1 (Not at all) to 5 (To a very high extent). It is interesting to contrast intrinsic and extrinsic motivation, but before doing so, it is also interesting to compare objective study behaviour in the form of study hours with the perception that one is exceeding the minimum effort required in order to obtain a passing grade. In this way we can gain an impression of whether countries have different norms in terms of what constitutes the minimum effort.

Figure 2.13 shows that the number of study hours per week is not related at all to the subjective perception of doing extra work above what was required to

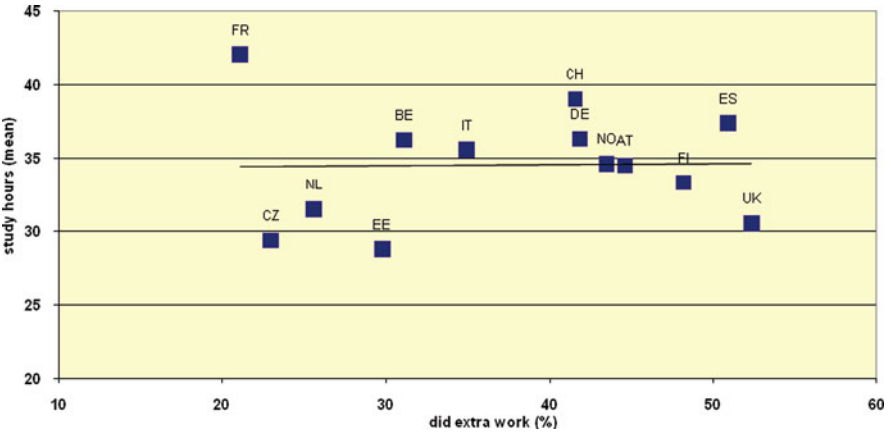

Fig. 2.13 Study hours per week and intrinsic motivation, by country

pass exams. This seems to suggest that graduates in different countries have a different perception of what constitutes "extra work". In most countries the average number of study hours ranges between 30 and 40, while the percentage reporting that they did extra work varies from slightly more than 20% to over 50%. Countries with roughly the same average study hours, like Belgium and Spain, or the Netherlands and the UK, vary strongly in the subjective perception of "doing extra work", while countries with very different mean hours of study, like France and the Czech Republic, share much the same subjective experience of "extra work".

Although the perception of what constitutes extra work may differ from country to country, it is still meaningful to compare the relative position on the indicators of intrinsic versus extrinsic study motivation. Figure 2.14 gives an indication of the relation between these two dimensions. This figure clearly shows that there is little relation between the two dimensions at the aggregate level of countries. However, different countries occupy distinct positions in the space created by these two indicators. The average level of extrinsic motivation is higher than the average level of intrinsic motivation. Most countries are in the left upper corner (strong extrinsic motivation, weak intrinsic motivation). Students in all these countries seem to be more driven by the desire for tangible results than the desire to get more out of the subject matter. The lower left corner displays countries with a weak motivation on both aspects. Especially the Netherlands and Belgium show very low scores both on extrinsic and intrinsic motivation. In the upper right corner we only have two countries, Spain and the UK, in which graduates are strongly motivated both by the desire to get more out of their study and by a wish to get good grades. There are no countries in the lower right corner in which graduates are more strongly motivated by the desire to get more out of their study than by a wish to get good grades.

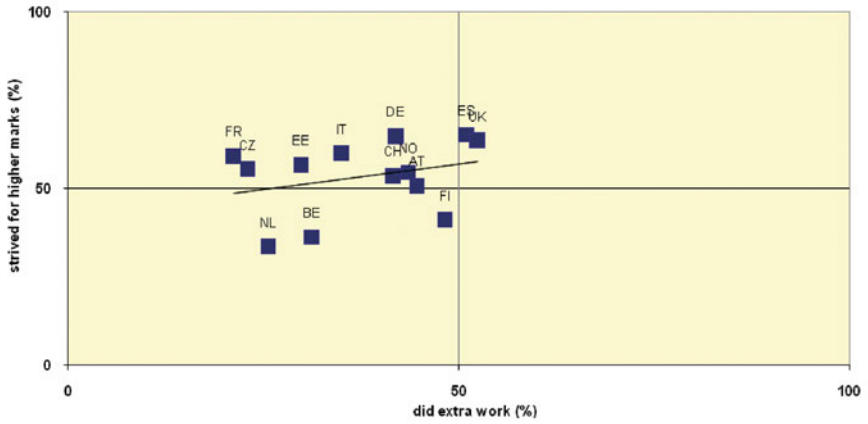

Fig. 2.14 Extrinsic and intrinsic motivation, by country

2.3.7 Experiences Acquired During Higher Education

Up to now we have been talking about differences in organised learning activities. Students may not only gain competences by following formal education, they also gain a lot from informal activities or extra-curricular activities. A lot of attention is paid to the provision of practical work experience as part of the curriculum as a way of preparing graduates for the world of work. We already saw in Fig. 2.10 that there are strong differences between countries in the extent to which work placements or internships were emphasised as part of the programme. Figure 2.15 shows the proportion of graduates per country that actually followed work placement or internship in each country.

In general, the pattern quite strongly follows that which we saw in Fig. 2.10. Countries such as the Netherlands and France, in which a high proportion of graduates reported that this form of experience was strongly emphasised in the study programme, also show a high proportion of graduates who actually participated in such activities. Conversely, British, Czech and Italian graduates reported low levels of both emphasis and participation.

There are of course other ways in which graduates can obtain work experience during higher education. Figure 2.16 gives the percentage of graduates indicating that they had study-related work experience during higher education (excluding work experience obtained during a work placement or internship) as well as the percentage indicating that they had work experience that was not related to their study programme.

We can note that on both dimensions, there is a large variation between the countries in this informal way of gaining skills. It is clear that there is no trade-off, at the national level at least – between study-related and non-study-related work experience. In fact, in countries with the highest percentage of graduates who gained study-related work experience – Austria, Finland and France – more than half of all graduates also received non-study-related work experience. Conversely, with the exception of Belgium, the countries with low proportions of graduates

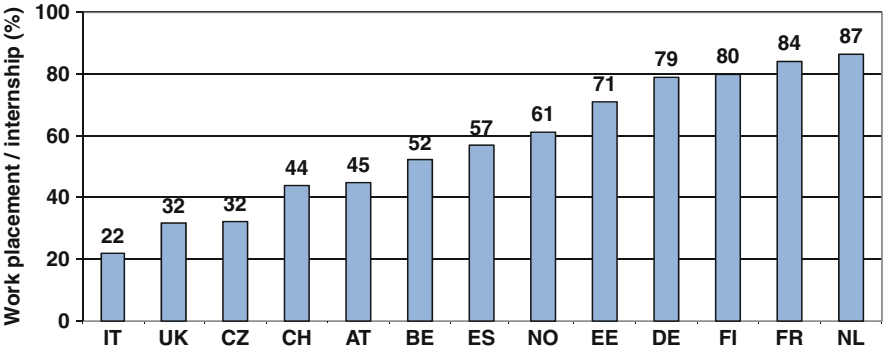

Fig. 2.15 Percentage of graduates who followed a work placement or internship during higher education, by country

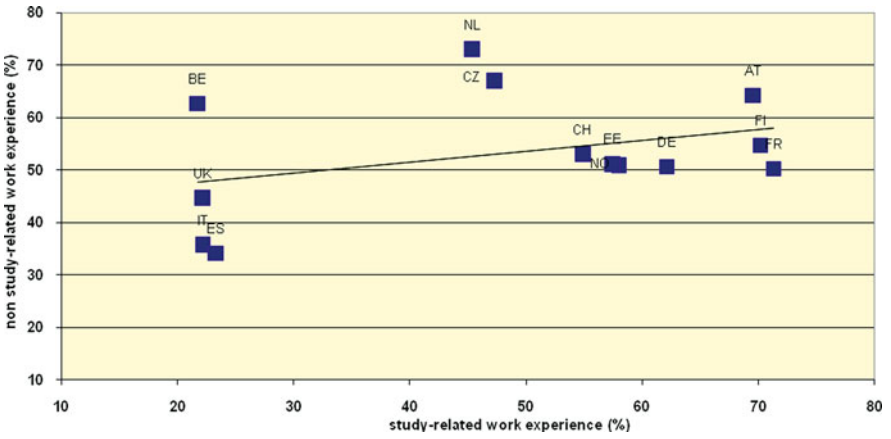

Fig. 2.16 Study-related and non-study-related work experience during higher education, by country

receiving study-related work experience are also the countries that score lowest on non-study-related experience. In the light of the relatively low number of study hours and limited degree of willingness to do extra work reported by Czech and Dutch graduates (see Fig. 2.13), it is striking that these countries show the highest proportion of graduates reporting non-study-related work experience. We also saw that a relatively low proportion of graduates in these countries found the study programme demanding (see Fig. 2.4). At first sight, it seems that students in those countries choose to make use of the lack of challenge presented by the programme to spend less time on study and earn extra money on the side. This may well be the case at the system level, in the sense that in countries where students in general spend less of their time on study they have more time for casual work. However, at the individual level we see that those with non-study-related work experience in those countries actually studied slightly longer hours on average than those without such experience. The apparent paradox between the individual level and the country level can be resolved by assuming that in the Netherlands and the Czech Republic, like in every country, individuals differ in their willingness to sacrifice leisure time in order to work (whether for money or study results), but that in these countries hard workers and lovers of leisure alike spend less time on study and more time on casual work.

At the end of the day, it may not matter how exactly graduates obtain relevant work experience prior to graduation, as long as they do so. Figure 2.17 gives an overview of the percentage of graduates who left higher education without any relevant experience at all, be it through learning activities that form part of the study programme like a work placement or internship, or through the acquisition of study-related work experience on one's own initiative outside the study programme. In most countries relatively few graduates leave higher education without some form of relevant experience. There are however countries where more than a quarter of all

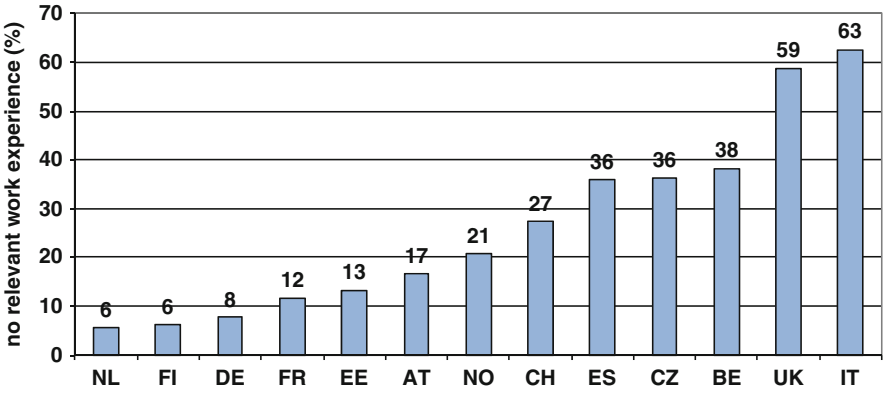

Fig. 2.17 Percentage of graduates who left higher education without acquiring relevant experience (work placement, internship or other study-related work experience) during the study programme, by country

graduates lack any such experience, and in the UK and Italy this applies to around six in every ten graduates.

Of course, work experience is not the only way to acquire relevant skills. In Fig. 2.18 we present the percentage of graduates indicating that they held a position in a student or other voluntary organisations while studying. Again we can see large variations across countries. Taking up such positions is quite uncommon in the Czech Republic, Spain and Italy while it is relatively common in Belgium and the Netherlands.

Figure 2.19 gives another important way of gaining relevant skills: the proportion of graduates who spent some time abroad for study or work during their higher education programme. Again we see large variations across countries. It is very

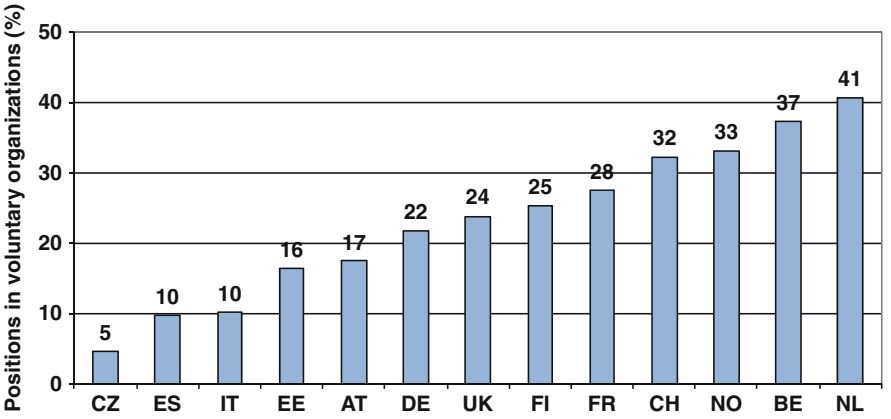

Fig. 2.18 Percentage of graduates who held positions in student or other voluntary organisations during the study programme, by country

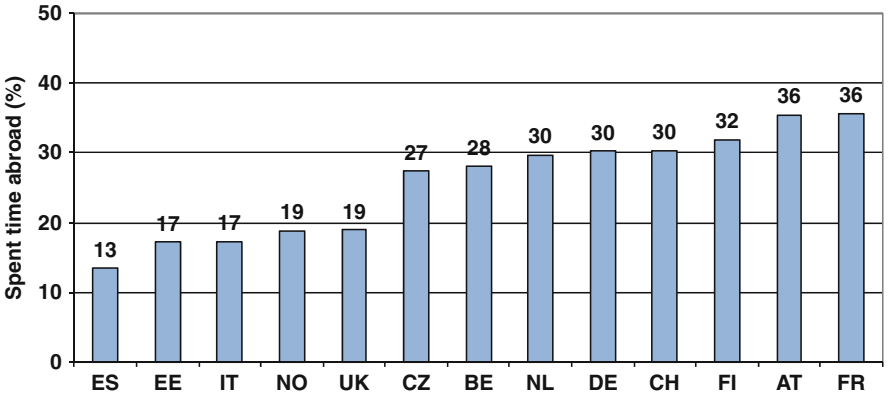

Fig. 2.19 Percentage of graduates who spent time abroad for study or work during the study programme, by country

uncommon in Spain, where only one out of every ten graduates indicates that they had such experience. At the other end of the distribution we can see countries like France, Austria, Poland and Finland, where one out of every three graduates has international experience.

2.4 The Effects of Programme Characteristics on Competences

It is clear that countries in Europe differ strongly in the kinds of experiences students are exposed to while in higher education. Can we find any evidence in our data for the claim that these differences matter? How is the acquisition of competences related to programme characteristics and modes of teaching? The following graphs present the results from some multivariate analyses in which the competences of the graduates in each of the four areas are related to programme characteristics, modes of teaching and learning and learning experiences outside higher education. All results are controlled for general differences between countries, fields of study, level of degree and some personal characteristics (gender, age, social background and study behaviour). We deliberately choose not to include any experiences after leaving higher education, notwithstanding the fact that the dependent variable was measured at the time of the survey and thus affected by these latter experiences as well. However, these experiences are in turn also affected by the higher education experiences and we wanted to have as close as possible an estimation of the total effect of what higher education graduates have at their disposal when entering the labour market.[5] Although the results are presented in different graphs, all effects are estimated in one analysis, so controlling for all other variables. We present the

[5]We also estimated the models including experiences after leaving higher education, but these do not alter the effects of the other variables.

standardised[6] effects to allow for an easy comparison across the graphs. Full results are available on request from the authors.

2.4.1 The Effects of the Study Programme

We look first at the effects of programme characteristics. If we look at the results in Fig. 2.20, it is clear that in general the effects are quite weak. All estimates are smaller than 0.10. Nonetheless, following a demanding programme is clearly related to the competence level in all of the domains except foreign language skills. It seems that programmes that ask more of their students get better results in terms of competences. Interestingly, the degree of academic prestige of the programme as reported by graduates is as strongly or perhaps even more strongly related to competences, including foreign language skills. There are different possible interpretations of this result. It may be that prestigious programmes are characterised by better teachers and superior teaching resources in general. However, it may also be the case that these programmes simply recruit better quality students. The remaining programme characteristics only show rather weak effects on some of the competence domains.

2.4.2 The Effect of Modes of Teaching and Learning

Turning to modes of teaching and learning, again we can note that the estimated effects are weak at best (see Fig. 2.21). By comparing pairs of characteristics as above, we can conclude that more active, student-centred methods appear to stimulate competence develop somewhat more than passive, teacher-centred methods,

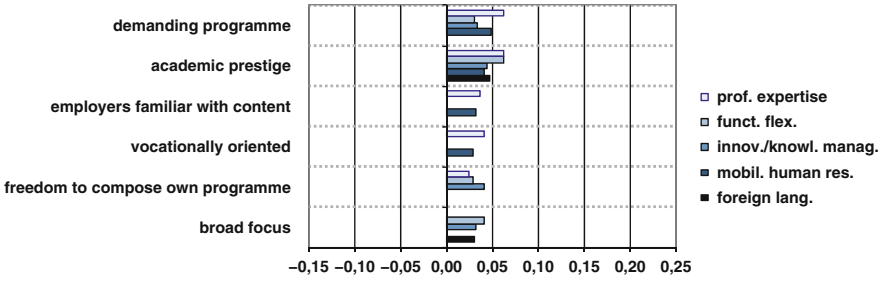

Fig. 2.20 Effects of programme characteristics on graduates' mean level of competence in five domains. All effects significant at 0.01 level. Non-significant effects not shown

[6]By standardisation, the scales are made comparable with a mean zero and a standard deviation one. The parameters display the increase or decrease in the dependent variable when the independent variable increases by one standard deviation. Effects between 0 and 0.10 are considered weak, between 0.10 and 0.25 moderate and above 0.25 strong.

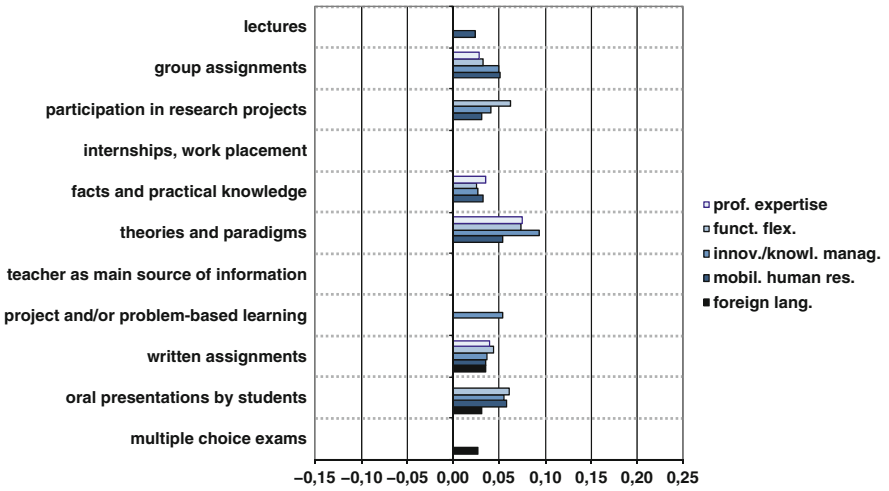

Fig. 2.21 Effects of modes of teaching and learning on graduates' mean level of competence in five domains. All effects significant at 0.01 level. Non-significant effects not shown

as seen in the stronger effects of group assignments than lectures, and in the positive effect of project- and/or problem-based learning on competences in the domain innovation and knowledge management, whereas a strong emphasis on the teacher as main source of information shows no significant effects on competence development. Programmes that offer experience in the form of participation in research projects also achieve results in several domains, in contrast to programmes that strongly emphasise internships and work placements (see also below). Interestingly, although both emphasis on facts and practical knowledge and on theories and paradigms appears to stimulate competence development in all areas except foreign language skills, the latter emphasis shows clearly stronger effects, even stronger than all other effects. Finally, emphasis on written assignments and oral presentations as a form of assessment is clearly more effective in terms of competence development than emphasis on multiple choice exams.

2.4.3 The Effect of Other Learning Experiences

Students do not only acquire competences as a result of their higher education programme, but also develop skills outside this context. We asked the graduates to report on these other learning experiences, such as study or working abroad during higher education or having had work experience before or during higher education. Figure 2.22 presents the result of the importance of these other learning experiences.

Holding a position in a student or other voluntary organisation or acquiring study-related work experience before or during higher education is related to higher levels

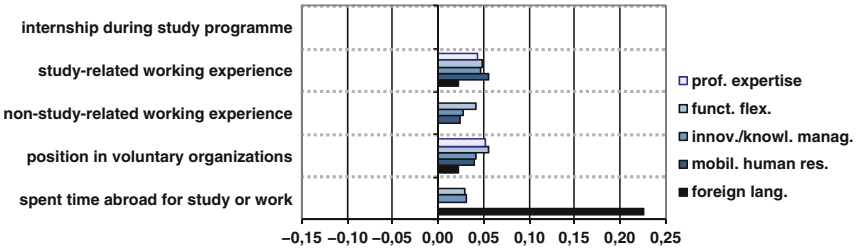

Fig. 2.22 Effects of various forms of experience on graduates' mean level of competence in five domains. All effects significant at 0.01 level. Non-significant effects not shown

of competence in each of the five areas. Non-study-related work experience also has some effects – albeit much weaker – on competence development in the domains of functional flexibility, innovation and knowledge management and mobilisation of human resources. As we might expect, spending time abroad is mainly effective as a way of developing competences in the area of foreign language skills, and also has a weak effect on functional flexibility and innovation and knowledge management. In line with the result above concerning emphasis on internships and work placements as a mode of teaching, we find no effect of actually having followed an internship or work placement. This seems surprising, since internships are often thought to provide a good basis for developing professional expertise (e.g. OECD, 2000). We should, however, treat this result with a certain degree of caution, since internships and work placements form a compulsory part of many study programmes or even of whole types of education in a country. In that case, this result suggests that, on average, graduates of study programmes offering such forms of work experience as part of the programme are no more or less competent than graduates of programmes in which this is not the case. This need not mean that individual students have not benefited from participating in internships and work placements.

2.4.4 Study Behaviour and Performance

Figure 2.23 shows the effects of students' study behaviour and the results of their study on competences in the five domains.

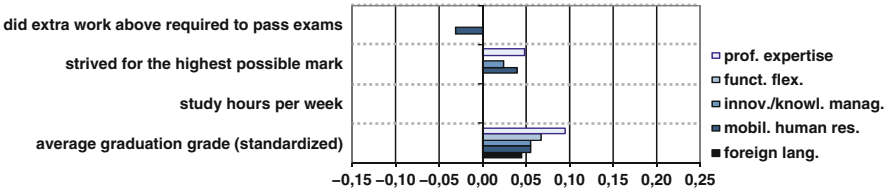

Fig. 2.23 Effects of study behaviour and performance on graduates' mean level of competence in five domains

As one might expect, there is a clear relation between grades achieved and the level of competence in the five domains. Also consistent with what one would intuitively expect is the finding that the relation is strongest in the case of professional expertise. After all, students are mainly assessed in terms of their grasp of their disciplinary knowledge and skills, and less so in terms of more generic competences. After controlling for grades, actual study behaviour and motivation has scarcely any effect on competences. Only extrinsic motivation – the extent to which graduates reported that they strived for the highest possible marks – showed any significant positive effect on competences above and beyond the effect of the marks themselves.

2.5 Does Higher Education Provide a Good Basis to Enter the Labour Market?

Demonstrating a relation between programme characteristics and modes of teaching on the one hand and the level of competences on the other hand does not necessarily mean that higher education provided a sufficient basis to enter the labour market, nor does it necessarily indicate a sufficient basis for the later career. To indicate this, we asked the graduates to assess on a scale from 1 "not at all" to 5 "to a very high extent" whether their study programme was a good basis for:

- starting work;
- performing your current work tasks;
- future learning on the job;
- future career;
- your personal development;
- development of entrepreneurial skills.

Figures 2.24, 2.25 and 2.26 present the evaluation results of graduates' study programme as a basis for work, career and everyday life, by country. We start in Fig. 2.24 with the evaluation of the programme as a basis for starting work, and as a basis for current work tasks (i.e. for work tasks five years after graduation). This gives an impression of the extent to which the programme prepared graduates for work in the short and the medium term.

In general, the two dimensions are quite strongly related, suggesting that, in the eyes of graduates, there is a link between what works well in the short term and what works further along in the career. The evaluation of the programme as a basis for performing current tasks is somewhat less positive than that for starting work in almost all countries. This is only to be expected, since even in the best imaginable case the knowledge and skills gained in education will be subject to a certain degree of obsolescence over time (De Grip & Van Loo, 2002). The most striking feature of the graph is the strong position of Norway on both dimensions. The vast majority of Norwegian graduates feel that their study programme has prepared them well for

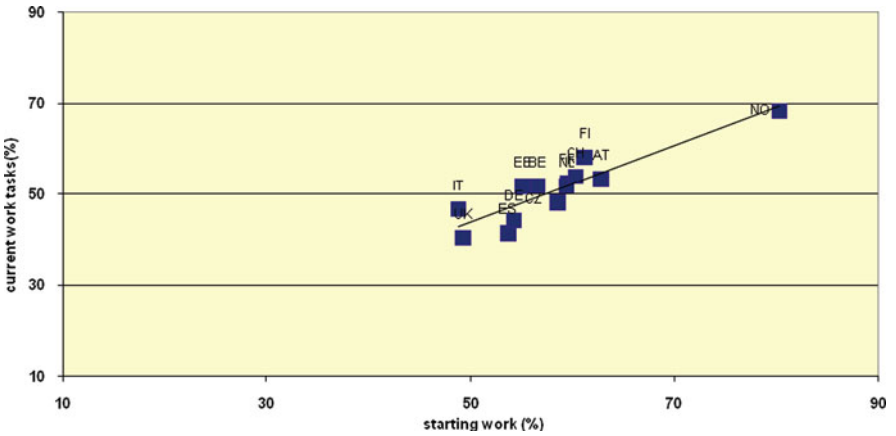

Fig. 2.24 Evaluation of study programme as basis for starting work and for performing current work tasks, by country

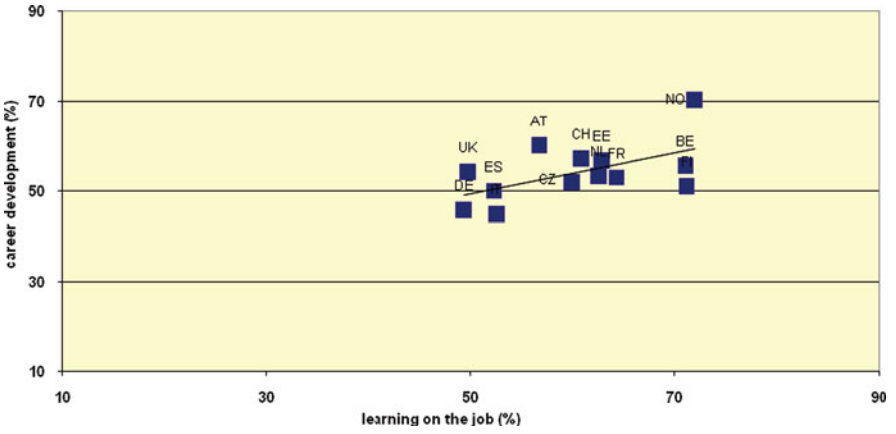

Fig. 2.25 Evaluation of study programme as basis for further learning on the job and for the future career, by country

the work both in the short and longer term. By contrast, only around half of Italian, British, German and Spanish graduates feel so well prepared.

Figure 2.25 provides a view of the evaluation of the higher education in different countries as a basis for developing one's skills and career.

Like the evaluation of the programme as a basis for work in the short and the medium term, the evaluations of the two aspects of further development are strongly related. In general, the evaluation of the programme as a basis for learning on the job is more favourable than that for future career development. Especially, Belgian and Finnish graduates are much more enthusiastic about their programme in the former than in the latter respect. Germany, the UK, Spain and Italy again score quite low on both indicators.

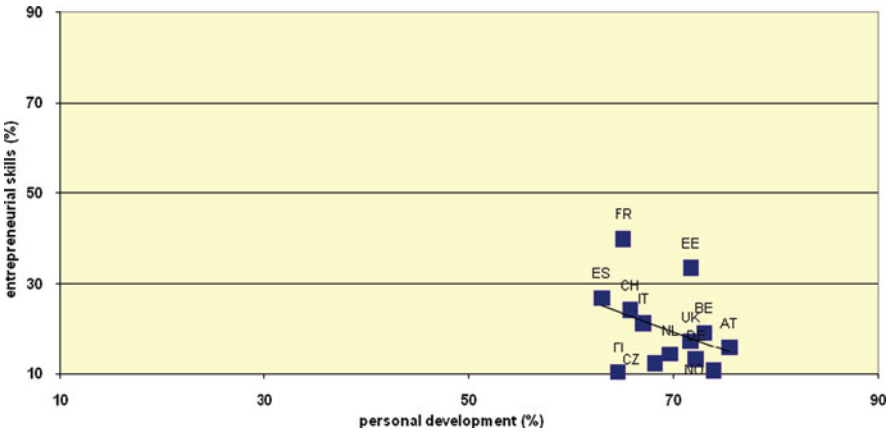

Fig. 2.26 Evaluation of study programme as basis for personal development and for the development of entrepreneurial skills, by country

Figure 2.26 provides a view of the evaluation of the higher education in different countries as a basis for personal development and for developing entrepreneurial skills.

In contrast to the previous two graphs, there is no a priori reason to expect that the two dimensions in Fig. 2.26 should be related. Indeed, there is no positive relation, and even a weak negative relation between the two. Interestingly, higher education scores highly on the dimension of personal development. In all countries, this is the dimension on which higher education is most positively evaluated. By contrast, the development of entrepreneurial skills is the aspect that is given the lowest evaluation, in all countries except France.

How are these evaluations related to characteristics of the study programme? The following figures display the main results of six regression analyses on the opinions of the graduates regarding these six areas. All estimates are controlled for general country differences. As in the earlier analysis all estimates shown are the standardised effects. Full results are available on request from the authors.

2.5.1 The Effects of the Study Programme

Figure 2.27 presents the effects of the characteristics of the study programme.

Many effects of the programme characteristics can be considered as moderate (range from 0.10 to 0.25). Especially, vocational oriented programmes seem to do a good job in preparing students to start working, to perform their current work tasks, for further learning on the job, and for the future career, and they even seem to have a positive effect on providing a basis for personal development and entrepreneurial skills. The same applies to having followed an academically prestigious programme, although the effect sizes are mostly smaller, with the notable exception providing a

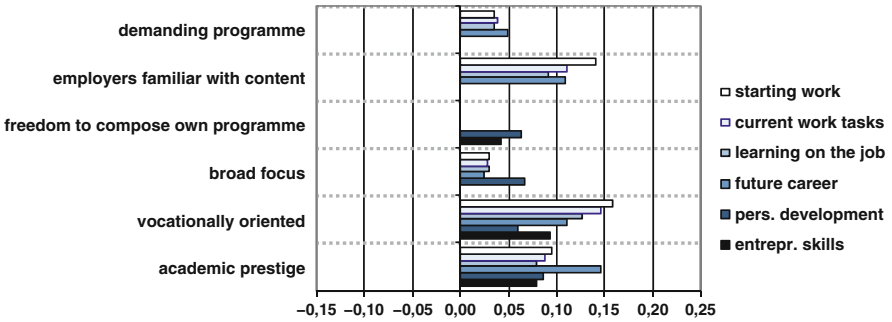

Fig. 2.27 Effects of programme characteristics on graduates' evaluations of the study programme. All effects significant at 0.01 level. Non-significant effects not shown. Reference category social science

basis for future career development. Having followed a programme that is familiar to employers also seems beneficial for the integration into the labour market, although not for personal development or (somewhat surprisingly) entrepreneurship. Demanding programmes show surprisingly little effect, as do other programme characteristics.

2.5.2 The Effect of Modes of Teaching and Assessment

Figure 2.28 presents the significant effects of modes of teaching and learning on the evaluation of the programme.

In general the effect sizes for modes of teaching and learning are smaller than for programme characteristics. Stressing facts and practical knowledge and project- and problem-based learning as modes of teaching has a consistent positive impact on all six areas. Stressing internships and work placements[7] has a positive effect on the labour market–related goals. Together with project- and/or problem-based learning, group assignments and participation in research projects seem particularly beneficial for the development of entrepreneurial skills. All other effects are rather weak.

2.5.3 The Effects of Acquired Competences

Figure 2.29 shows the effect of graduates' competences at the time of the survey on their evaluation of the study programme. Although it is far from certain that

[7]This seems contradictory to the earlier finding that showed no effect on competences. However, the effect on starting work may be partly due to the fact that internships and work placements may provide information to future employers about the skills of the graduates, and therefore result in smoother transitions rather than providing a good learning environment.

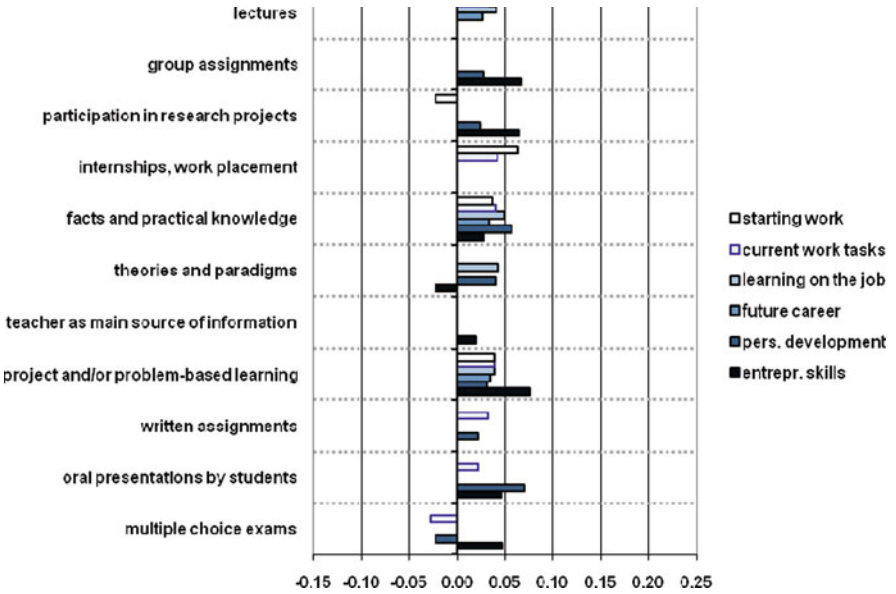

Fig. 2.28 Effects of modes of teaching and learning on graduates' evaluations of the study programme. All effects significant at 0.01 level. Non-significant effects not shown

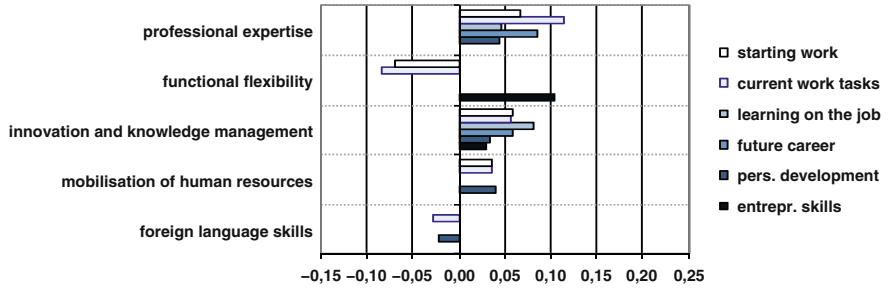

Fig. 2.29 Effects of competences on graduates' evaluations of the study programme

these effects represent causal relationships, it is interesting to note that graduates' competence levels in several domains are clearly related to their evaluation of their study programme. Particularly the level of competences in the domains of professional expertise and innovation and knowledge management are strongly related to graduates evaluations of their study programme. Professional expertise is most strongly related to the evaluation of the programme in terms of preparation for current work tasks and career development, although not at all to the development of entrepreneurial skills. Innovation and knowledge management is related to positive evaluations in all areas, but most clearly to the extent to which graduates felt that the study programme prepared them for learning on the job. The effects of functional flexibility are striking: competences in this area are related to more negative evaluations of the study programme in terms of starting work and performing current work tasks, but show by far the strongest effect on the evaluation of the programme

in terms of developing entrepreneurial skills. It is likely that the negative effects are a case of reverse causality, with graduates who feel that their programme has not prepared them well for work being forced to be flexible in order to make the best of a bad situation. Competences related to mobilisation of human resources are related to somewhat more positive evaluations of the programme in terms of work and career, while foreign language skills show weak negative effects on evaluations in terms of performing current work tasks and personal development.

It is clear that certain characteristics of the study programme completed by graduates and the competences they have acquired – much of which presumably in the study programme – have an effect on the evaluation of the programme given by graduates in terms of preparing them for the world of work and their personal life. It is interesting to see whether there are any observable effects of these characteristics on objective labour market outcomes. Chapter 8 provides an extensive analysis of labour market outcomes – both objective and subjective – and their determinants, and it is not our intention to duplicate that analysis here. Rather, we wish to "zoom in" on the effects that can be directly attributed to the study programme and acquired competences, without further control for characteristics of the labour market career after graduation. We concentrate on three outcomes, namely the search duration required to find the first job after graduation, the chance of being employed at the time of the survey and the hourly wage of working graduates at the time of the survey. Figure 2.30 shows the effects of programme characteristics on these outcomes.

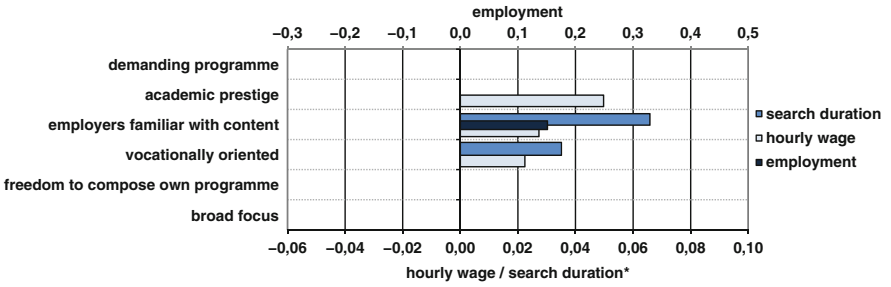

Fig. 2.30 Effects of programme characteristics on labour market outcomes[8]. All effects significant at 0.01 level. Non-significant effects not shown

[8]For ease of comparison with the other indicators, the sign of the effects of characteristics on search duration in Figs. 2.30, 2.31, 2.32 and 2.33 have been reversed, so that they can be interpreted as in terms of *reduction* of search duration. The analysis of search duration uses linear regression analysis, that of hourly wage loglinear regression (based on the natural logarithm of the hourly wage rather than the wage itself), and that of employment uses logistic regression analysis. In the latter analysis the log odds of graduates being employed as opposed to being unemployed is estimated, with those not currently in the labour force being excluded from the analysis. The wage analysis is restricted to those currently in paid employment, and the analysis of search duration to those who have sought work at some point since graduation. All the analyses contain controls for country of graduation, broad field of study, level of higher education, gender, age, parents' education, and the quality of the social network available to graduates.

Most programme characteristics have little or no effect on the three labour market outcomes. Given the fact that these analyses control for the effects of competences – see Fig. 2.33 – this is not really surprising. It is notable that the programme characteristics that do have effects are those that we might expect to have an influence distinct from that of competences. Both vocationally oriented programmes and those whose content is familiar to employers may be expected to have strong links to the world of work, and we might expect graduates of such programmes to find their way to employment more quickly and assuredly than graduates of otherwise similar programmes with fewer links to employers. Indeed, graduates of such programmes experience shorter search durations and receive a higher wage at the time of the survey. Graduates of programmes which are familiar to employers also have better employment chances at the time of the survey. The only other characteristic that shows an effect is academic prestige, which quite strongly affects the wage received by graduates. Again, this is an effect that could be distinct from that of competences, with employers being prepared to reward graduates from the "best" universities and colleges regardless of the actual competence level of graduates.

Figure 2.31 shows the effects of experiences gained during higher education. It is obvious that work experience is the most important kind of experience for enhancing labour market outcomes. There is, however, a strong distinction between the effects of study-related and non-study-related experience. Whereas the latter increases graduates' employment chances at the time of the survey, it has no effect on wages and search duration. By contrast, study-related work experience has an effect on all three outcomes. This suggests that this kind of experience improves graduates' chances of finding work quickly, of maintaining a strong position on the labour market and of earning a good wage. Non-study-related experience on the other hand offers some "insurance" against unemployment in the long term, but neither helps graduates find work quickly nor increases their wage levels. The only other effect of experience is a very small effect of time spent abroad during higher education on wage. The lack of effect of internships seems surprising, but need not mean that this kind of experience is not effective. Internships are not randomly distributed across otherwise comparable graduates, but are heavily concentrated in certain fields of study and higher education institutions. The lack of an effect may

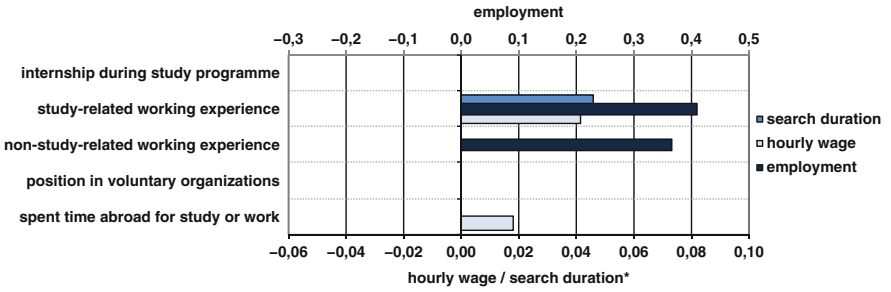

Fig. 2.31 Effects of various forms of experience on labour market outcomes. All effects significant at 0.01 level. Non-significant effects not shown

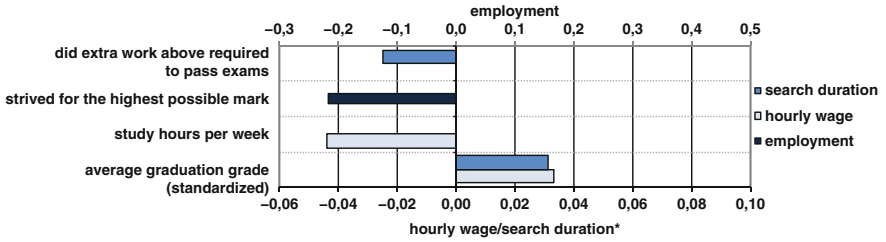

Fig. 2.32 Effects of study behaviour and performance on labour market outcomes

indicate that the net labour market prospects of graduates in these fields and or of these institutions are no better or worse than those of graduates in other fields or from other institutions. It does not mean that these graduates would do equally well if they had not been given the opportunity to participate in an internship.

Figure 2.32 shows the effects of study behaviour and study performance on labour market outcomes. It is clear that, although study performance (in the form of higher grades) reduces search duration and enhances wage levels, once this performance has been controlled for, study behaviour does not improve graduates' performance in the labour market. In fact, in some respects study behaviour is related to worse outcomes. Graduates who reported that they did extra work took longer to find work than those who did just what was required to pass exams. This may indicate a tendency of such graduates to be more critical in terms of the quality of the work they are prepared to accept. Graduates who strived for the highest possible marks were less likely to be employed five years after graduation. It is not immediately obvious how this result should be interpreted. Graduates who put in more hours for study earned lower wages than those who studies shorter hours. It may be that less gifted students need to put in more study hours in order to get through the study, but that this is not enough to raise their productivity level (and therefore their wages) to that of their more gifted peers.

Figure 2.33 shows the effects of competences on labour market outcomes. Professional expertise stands out as the competence that allows graduates to find

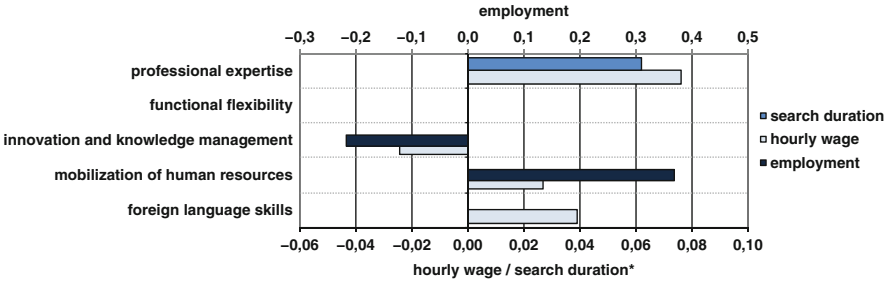

Fig. 2.33 Effects of graduates' mean level of competence in five domains on labour market outcomes. All effects significant at 0.01 level. Non-significant effects not shown

work most quickly and secures them a higher wage five years after graduates, although graduates with a high level of expertise are no more or less likely to be employed at the time of the survey. The competence domain associated with the best employment prospects is mobilisation of human resources. This makes sense: the best way to mobilise your own resources is to get a job in the first place. This competence also has an effect on wages, as do foreign language skills, but these effects are weaker than those of professional expertise. Curiously, competences related to innovation and knowledge management lead to worse labour market prospects five years after graduation.

2.6 Conclusions

It is time to take stock of the main results. We started our analysis with the identification of three trends (the growing importance of human capital, growing importance of flexibility and globalisation) resulting in five demands on higher education graduates. In the survey, we found evidence that the demands in the areas of professional expertise, functional flexibility, innovation and knowledge management, mobilisation of human resources and foreign language skills are more or less universal. In each of the 13 countries for which we presented data, we note that the required level in these areas is relatively high, with only fairly small differences between the different areas of competence and between the countries. The demand for foreign language skills of graduates was less pronounced, and differed quite strongly per country. The strong demand for competences is often, but not always, matched by a strong supply. Some 10% of the graduates indicate that their own competence level is significantly lower than what is required of them in their job. There are some sizable differences between countries. In Italy, France and Estonia, a relatively large share of graduates experience some serious shortages in their competences. In France we also note a relatively larger share of graduates experiencing a surplus in their competences, indicating that in France in particular graduates are ill-allocated to jobs.

There are some interesting differences between countries in the particular profile presented by the higher education system. Whereas a clear majority of graduates in Italy, Switzerland, the UK and Austria regarded their programme as demanding, this only applied to around a third of Dutch and Estonian graduates. Whereas the educational systems in Norway, Finland and the Netherlands were strongly vocational in their orientation, in other countries – including Austria and Germany with their famous binary systems – only around a quarter of all graduates described their higher education as strongly vocational. Even in countries in which higher education was strongly vocational in its orientation, few reported that employers were familiar with the content of the programme. In general, higher education in Europe appears to be rather broad in its focus, but graduates nonetheless report having had little freedom to compose their own programme.

Also in terms of modes of teaching and learning, there were some interesting results. Despite the attention that has been paid in recent years to more student-centred and active forms of learning, at the end of the last millennium higher education in Europe remained rather traditional, with a strong emphasis on lectures, and in many countries on the role of the teacher, and only rather limited application of group learning and project- or problem-based learning. There was generally more emphasis on theories and paradigms than on facts and practical knowledge, although in France and the Netherlands emphasis was slightly more on the latter than on the former. Assessment relies in most countries more strongly on written assignments and oral presentations than on multiple choice exams, although in Spain and the Netherlands the emphasis on the latter is about as strong as on the former. Students in most countries are given little opportunity to gain hands on experience as a formal component of the study programme, and such experience as there is usually takes the form of work placements and internships rather than participation in research projects.

The lack of opportunity to gain experience within the formal bounds of the programme does not prevent most students from gaining study-related work experience, and in most countries a clear majority of students leave higher education with some form of relevant experience under their belt. Exceptions are the UK and Italy, where three out of every five graduates leave higher education without experience. Many graduates also report having gained other forms of experience while in higher education. The most common form of such experience is non-study-related work experience – casual jobs and the like – but in some countries a relatively high proportion of graduates also report having held positions in student or other voluntary organisations, or having spent time abroad while in higher education. Again there are strong differences between countries, with Dutch and Flemish graduates most likely to have held positions in voluntary organisations, and Austrian and French graduates most likely to have spent time abroad.

Graduates in different countries report very different study behaviours. Whereas French graduates report having put in around 42 hours each week on their study, in the Czech Republic, the Netherlands and Estonia, graduates reported only around 30 hours of study each week. Interestingly, there was little if any relation between the actual hours spent on study and the perception graduates had of doing work above and beyond that required to pass exams. In most countries graduates appeared to be mostly driven by an extrinsic study motivation, that is, a desire to achieve high marks, and much less by intrinsic motivation. Only in Spain and the UK did a slender majority of graduates report that they did work above what was required to pass exams, while most Dutch and Flemish graduates seemed to be neither intrinsically nor extrinsically motivated.

The effects of programme characteristics on competences were surprisingly modest, but demanding and prestigious programmes seemed to have a positive effect on most competences. There was evidence that active, student-centred study modes of teaching were more conducive to competence development than more traditional, teacher-centred methods. A strong emphasis on theories and paradigms was found

to stimulate competences more than a practical emphasis, while more information-rich assessment methods such as written assignments and oral presentations were more effective than multiple choice exams. Various kinds of experience were found to promote competence development, particularly study-related work experience, although against expectations no effect at all was found of internships and work placements. After controlling for grades, which were clearly related to competences in all five domains, hardly any residual effects of study behaviour and motivation were observed.

Does the study programme in higher education provide a good basis to enter the labour market? In most countries around half of all graduates indicated that the study programme formed a good basis for starting work and a slightly lower percentage indicated that it was still useful five years later in their performance of their work tasks. Graduates were somewhat more positive in their evaluation of their programme in terms of further learning on the job and career development. However, the aspect on which graduates evaluated their programme most positively was as a basis for personal development. By contrast, only around 20% indicated that their higher education programme provided a good basis for developing entrepreneurial skills. In terms of graduates' evaluations, the most successful programmes are characterised by having a strong vocational orientation and/or strong academic prestige and in terms of preparation for the labour market a strong degree of familiarity by employers of the content of the programme. Modes of teaching and learning showed only rather modest effects on these evaluations. Graduates' competences also affect the evaluation of the study programme. Professional expertise especially improves the evaluation of the programme in terms of preparation for current work tasks and career development, while innovation and knowledge management is most clearly related to the extent to which graduates felt that the study programme prepared them for learning on the job. Functional flexibility is related to a negative evaluation of the programme in many respects, but competences in this area show by far the strongest effect on the evaluation of the programme in terms of developing entrepreneurial skills.

Most programme characteristics have little or no effect on labour market outcomes. Those characteristics that do have effects are those that we might expect to have an influence distinct from that of competences. Graduates from prestigious programmes and of programmes with strong links to the world of work find their way to employment more quickly and assuredly than graduates of otherwise similar programmes with fewer links to employers. Work experience, especially when this is linked to the content of the study programme, has a strong positive effect on labour market outcomes. Time spent abroad during higher education is associated with higher wages. Good performance in higher education in the form of higher grades also gives a boost to labour market outcomes, but once this has been controlled for, there is no residual benefit of study motivation or study behaviour. When we turn to competences, professional expertise stands out as the competence domain that allows graduates to find work most quickly and secures them a higher wage five years after graduates. Competences associated with mobilisation of human resources also promote success in the labour market.

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Chapter 3
The Professional Work of Graduates

Harald Schomburg

3.1 What Makes a Profession?

Whatever else is expected of higher education graduates in today's knowledge society, they are certainly expected to become experts in their own professional domain. In comparison to the other four demands on higher education graduates that were identified in Chapter 2, there is nothing new or recent about the demand for professional expertise. For centuries, society has turned for professional advice and guidance to its scientists, philosophers, lawyers, physicians and so on, and for centuries it has been primarily universities that have served as the basis for training such professional experts. What is unprecedented, however, is the sheer volume of people attending universities, whether expressed in absolute numbers or as a percentage of the total population. What impact has this enormous expansion had for the nature and meaning of professional expertise? Are graduates from institutions of higher education in Europe still working mainly as "professionals"? What do we mean by the term "professional", and how has this changed in recent times? Are graduates adequately prepared by their course of study to the required level of professional expertise? These are some of the key research questions of the REFLEX study.

It is obvious that we use the term "professional" in a different way from everyday life, where it is often used to differentiate between work done by "amateurs" and that done by "professionals". "Professionals" are paid for their work and are expected to provide work of a high quality. Underlying this distinction is a second distinction between the competences "amateurs" and "professionals" are thought to possess. The latter are supposed to have certain individual qualities and/or to have followed special training which allows them to perform at a "professional" level.

This everyday definition is obviously inadequate when it comes to explaining what it means for a higher education graduate to work as a "professional". In our view it is also not sufficient to follow the anglo-saxon tradition in which all

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occupations typically requiring a higher education degree are classified as "professional". This concept occupies a central place in the International Standard Classification of Occupations (ISCO), in which the term "professions" was introduced to describe the second major group. The German case illustrates how difficult it is to translate this into another language. In the German translation "professions" was translated as "Wissenschaftler" ("scientists"), which is too restrictive to apply to the broader group of teachers, engineers, etc. that are included in this group. A similar problem occurs when translating into French: "professions intellectuelles et scientifiques".

Others, especially sociologists, have developed theories and taxonomies to define very restrictively the occupations that can be regarded as "professions". Mainly on the basis of the "classical" professions – medical doctors, lawyers and the like – and the way these have developed in Anglo-Saxon countries, they developed a model of "professions", analysing other occupations in terms of how far they have progressed towards achieving the status of these professions ("professionalisation"). Professionalization was analysed using the so-called escalator model: first a school is established, then an association, then examinations, then licensing, then an ethics code and finally the occupation arrives at its destination – the status of full profession (Goode, 1969; Wilensky, 1964).

In recent years this puristic view of "professions" has been severely criticized, and a broader view has emerged in the context of the diagnosis of the rise of the "knowledge society". This was also the basic concept of the REFLEX project.

The label "professional" is associated with: *autonomy* (Friedson, 1988), *expertise* (Schön, 1983) and a *body of knowledge* (Etzioni, 1969). The "autonomy" here is not the work autonomy of individual professionals, but rather the autonomy of the *group* of professionals that allows it to set up its own rules and regulations for their work. These characteristics are related to the concepts of *status* and *cultural capital* (Bourdieu & Passeron, 1977). The label constitutes in the view of Foucault (1977) a rhetorical resource, and source of power.

Since the early trait models are no longer acceptable, Watson (2002) has proposed that we should abandon the use of the term "professional" in an analytical sense, since its usage is slippery and ambiguous. But his alternative proposal, to use a term which only refers to the work content (such as "expert occupation" or "knowledge-based occupation"), creates new problems, because such a functionalist term ignores the bulk of the research literature which describes the system of professions in terms of a code of ethics, standardized education and criteria for certification, a strong professional association, monopolization of a particular labour market through the regulation of entry and so on (see Alvesson, 2001).

Morrell (2004) notes the failure of the naive functionalistic approach to integrate three perspectives, namely the way in which professional knowledge is constructed as an element of a discursive practice, the way in which professional roles are negotiated and constructed within and across organizational boundaries and the role the professions play in creating and maintaining systems of value and power. The concepts of knowledge, organization and power will be further elaborated in this chapter.

The professions play a key role in Harold Perkin's (1996) analysis of the dramatic changes in modern history as a "revolution of the professionals" or "the rise of a professional society". Perkin follows Robert Reich's view of the key role of the "symbolic analyst" in the future society and economy. "Such knowledge-based services are the province of professional experts, without whom they would not exist. And professional knowledge is based on human capital, created by advanced education and experience on the job, and is itself the scarce resource that enables the professionals to command high "rents" and rewards in kind" (Perkin, 1996, p. 6).

In Perkin's view the "classical professions" are not the key players in the rise of a professional society. Besides "professional experts", he points out the role of "managers": "And among the professionals most responsible, the key players are the professional managers of the great corporations and their counterparts in government, controlling the economy and administrating its policies and, increasingly, distributing the income and arranging its social relations" (Perkin, p. 6).

We will confront this conception of the new elites in the professional society with the empirical findings of the REFLEX study. Do the managers really emerge as the key players? And if so is this true for all countries?

We will start by developing a typology of occupations which allows us to differentiate between broad areas of work of higher education graduates. This typology of professions will be used in the whole chapter when we look at the professional role and identity of graduates, their professional expertise and aspects related to power such as income and exclusivity. We aim to find some empirically based answers to the question, to what extent different classes of professions in different countries are actually characterized by things like knowledge monopolies, regulated access, peer control, etc.?

3.2 Who is Working as a "Professional"?

3.2.1 The Occupation

To obtain a first rough view of the extent graduates are working at the level of professionals, we look at the percentage of graduates per country who are working in the major groups of "professionals" or "managers" according to the ISCO88-COM classification of occupations. As Fig. 3.1 shows, 74% of graduates across all countries are working in occupations at this level, 64% as professionals and 10% as managers. Most other graduates were working at the next level, namely "technicians and associate professionals". Only 6% of graduates were working in lower level jobs as clerks or skilled workers. A similar percentage of professionals was found in the earlier CHEERS study.

It is clear from Fig. 3.1 that the percentage of graduates working at the professional level varies quite strongly by country. In France, Austria, Germany, Norway and Estonia 80% or more of graduates work as "professionals", while in UK only 61% of the graduates were working at this level.

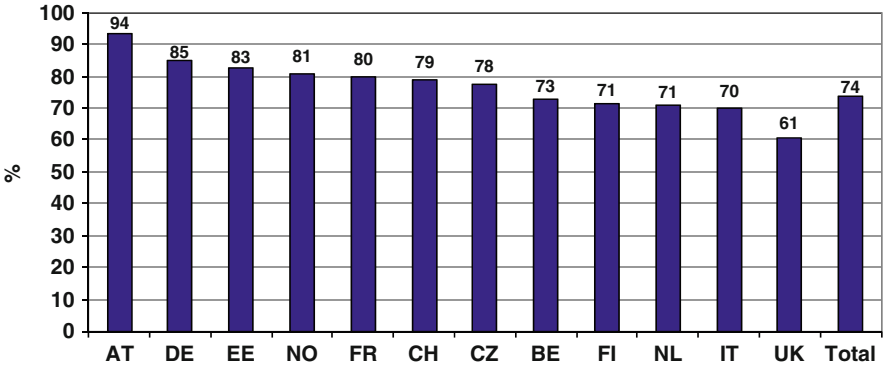

Fig. 3.1 Graduates working as "Professionals" or "Managers", 2005, by country (percent)

As Table 3.1 shows, the kind of occupation depends to a great extent on the type of higher education degree[1] the graduates gained in 1999/2000. In all countries, first-level programmes more often lead to "non-professional" positions, especially

Table 3.1 Occupational level by country and type of degree (percent)

	IT	ES	FR	AT	DE	NL	UK	FI	NO	CZ	CH	BE	EE	Total
First level:														
Legislators, senior officials and managers	4	5	5	11	10	8	10	7	7	7	18	10	23	11
Professionals	51	11	68	78	71	60	50	40	67	53	60	49	57	54
Technicians and associate professionals	36	59	21	10	15	23	24	40	23	36	14	36	17	26
Clerks	7	19	2	0	3	4	10	6	1	1	1	3	1	5
Other	1	7	4	1	1	5	6	6	2	2	5	2	1	4
Second level:														
Legislators, senior officials and managers	3	7	20	6	5	11	15	11	6	6	13	10	20	9
Professionals	68	45	67	88	82	67	61	81	90	76	66	69	75	73
Technicians and associate professionals	19	23	10	5	9	18	11	6	2	17	16	18	5	13
Clerks	8	19	2	1	3	3	9	1	0	0	2	1	0	4
Other	1	6	1	0	1	1	4	2	1	1	3	1	0	2

[1] We use the label "first level" for graduates who have three to four years of higher education (equivalent to bachelors in some countries) not providing direct access to doctorate. We use the term "second level" for graduates with five years of more higher education providing direct access to doctorate.

at the level of "associate professionals" just below "professionals" than do second-level degrees.

In Austria, Germany, Netherlands and Switzerland there are only rather small differences between educational levels in terms of the occupational level of graduates, whereas in Finland first-level (AMK) graduates are much more likely to work in lower level positions. It should be noted that the Finnish AMKs were only established in the 1990s and have their roots in former higher vocational training schools. Taking the short history of the AMK's into consideration, it in fact seems remarkable that almost 50% of their graduates work as "professionals" or "managers". All other countries show rather large differences by level of degree. For instance, in France 20% of second-level graduates work as "managers", compared to only 5% of first-level graduates. In Norway 90% of second-level graduates work as "professionals" compared to 67% of first-level graduates, while in Spain the respective percentages are 45% and 11%.

There are also important differences by field of study, and these differences are also sensitive to the degree level (see Table 3.2). The highest proportion of "professionals" can be found among graduates in the field of education (76%; mostly teachers), while the lowest proportion of "professionals" is found in the field of social science. The latter group has the highest proportion of managers (15%) and also a high proportion of associate professionals.

First-level social scientists (and law graduates) from first-level programmes are especially unlikely to be employed as "professionals" (45%, compared to 61% from second-level programmes in social sciences; 46%, compared to 74% in law). The highest proportions of second-level graduates employed in "professional

Table 3.2 Level of occupation by field of study (percent)

	Edu	Hum	Soc	Law	Nat	Mat	Eng	Med	Total
First-level degree									
Legislators, senior officials and managers	5	7	16	11	8	12	12	2	11
Professionals	69	59	46	56	59	62	57	52	54
Technicians and associate professionals	20	22	25	19	21	22	26	44	26
Clerks	3	7	9	9	5	2	2	0	5
Other	4	5	4	4	7	2	3	2	4
Second-level degree									
Legislators, senior officials and managers	5	6	14	5	7	6	10	3	9
Professionals	84	69	60	76	72	79	78	90	73
Technicians and associate professionals	9	16	18	13	15	12	10	7	13
Clerks	1	6	6	5	2	1	1	0	4
Other	1	3	2	1	3	1	1	0	2
Total									
Legislators, senior officials and managers	5	7	15	6	7	9	11	2	9
Professionals	76	65	53	72	68	71	68	71	64
Technicians and associate professionals	15	18	22	14	17	17	18	25	19
Clerks	2	7	7	6	3	2	1	0	4
Other	2	4	3	2	5	1	2	1	3

occupations" are in medicine (90%, compared to 52% from first-level study programs), education (84%, compared to 69%), engineering (78%, compared to 57%) and mathematics (79%, compared to 62%). Also remarkable is the rather high proportion of second-level humanities graduates working as professionals: 69%, compared to 59% from first level study programs.

3.2.2 Typology of Professions

A problem with the occupational classification based on 1-digit ISCO codes is that it shows little differentiation between types of occupations. Especially the category of professionals is quite diverse. To cast more light on the professional domains in which graduates work, a more differentiated typology of professions has been developed based on the more detailed coding of occupations. In line with the research literature on the professions, we differentiate between "classical professions", "technical experts" and "managers". We also follow the lead of certain sociologists in defining some occupations as "semi-professions" (Etzioni, 1969); for example, nurses, teachers, librarians and social workers. The semi-professions differ from the full professions in that their members are bureaucratically employed, often lack lifetime careers (the majority are female) and do not use such exclusive knowledge as that which characterizes law or medicine. Finally we added two other groups: the business and social science experts and non-professional occupations to obtain an exhaustive typology of all occupations. "Business and social science experts" include occupations such as "business professionals", "accountants", "personnel and careers professionals" and other "business professionals", but also "economists", "psychologists", "authors, journalists and other writers" and "administrative secretaries and related associate professionals". "Non-professionals" consist of lower level occupations such as clerks. The typology was based on the more detailed ISCO codes, in combination with the self-reported rating of the appropriateness of the occupation to the graduates' level of education. All graduates working in jobs for which a higher education degree is not required were classified as "non-professionals", regardless of the coding of the occupation. The appendix contains a full specification of the occupations belonging to each type of profession.

The resulting six types of professions are:

1. Non-professionals (e.g. clerks)
2. Business and social science experts (e.g. psychologists, business professionals)
3. Science and technology experts (e.g. engineers)
4. Semi-professions (e.g. teachers and nurses)
5. Classical professions (e.g. medical doctors and lawyers)
6. Managers

It is interesting to note that only 9% of all graduates belong to the "classical professions". These graduates were mainly educated in universities and have completed second-level study programmes. Only 3% of graduates from first-level study

Table 3.3 Type of profession by type of degree and gender (percent)

	Level of degree		Gender		
	First	Second	Males	Females	Total
Type of profession					
Non-professionals	10	14	11	13	12
Business and social science experts	32	27	26	31	29
Science and technology experts	20	18	31	10	19
Semi-professions	26	19	12	29	22
Classical professions	3	15	8	10	9
Managers	10	8	12	7	9
Count (n)	9,675	11,041	8,680	11,661	20,342

programmes work in this group, compared to 15% from second-level study programmes (see Table 3.3). The three biggest groups are business and social science experts (29%), the semi-professions (22%) and science and technology experts (19%). First-level graduates were relatively likely to enter the semi-professions: 26% of these graduates work in the semi-professions compared to 19% of second-level graduates. The group of graduates who work as non-professionals (as clerks, etc.) is rather small (12%). Female graduates (13%) are slightly more likely to fall into this group than male graduates (11%). Nine percent of graduates work as "managers", male graduates more often than female graduates (12% versus 7%).

The semi-professions are female dominated, consisting of 76% women (see Fig. 3.2). By contrast, science and technology experts are usually males (69%). Overall, a majority of graduates work in the private profit sector. An exception to this rule is formed by the semi-professionals, the majority of whom work in the public sector (83%).

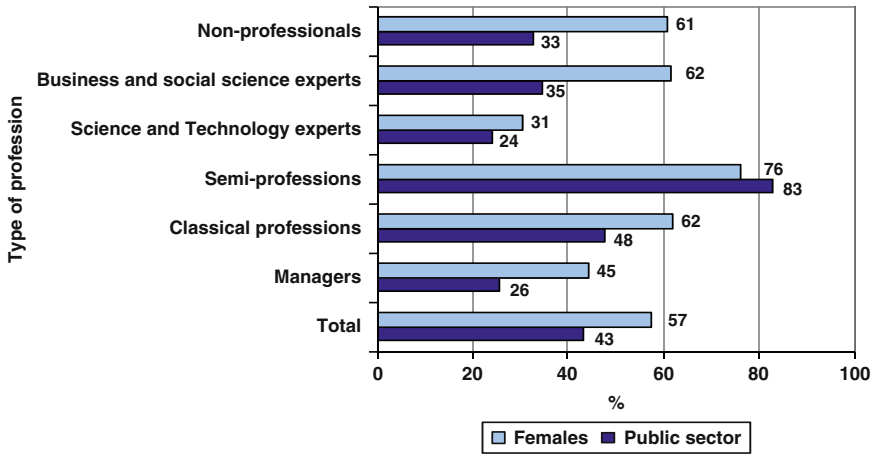

Fig. 3.2 Gender and economic sector by type of profession by (percent)

As we saw in Fig. 3.2, most semi-professionals are females, and most science and technology experts males. Figures 3.3 and 3.4 further illustrate the differences between these two types of profession by looking at the proportion of male and female graduates in each country employed in these professions. Figure 3.3 makes clear that, although the proportion of males working as science and technology experts is clearly higher than that of females in all countries, there are strong differences between countries. In Finland, the Czech Republic and Germany, about 40% of male graduates work in this area, compared to only about 20% in Estonia. The percentage of female graduates working in this type of profession is consistently smaller, and varies less between countries.

A similar picture is obtained from Fig. 3.4, with this time female graduates being more likely to choose to work in the semi-professions, but again with large differences between countries. More than half of Norwegian female graduates work as semi-professionals, compared to less than one in five in Switzerland. It is noticeable that a relatively high proportion of males in Norway and France also work in this group of occupations. In other countries the proportion of males is much lower, with only relatively small differences between most countries.

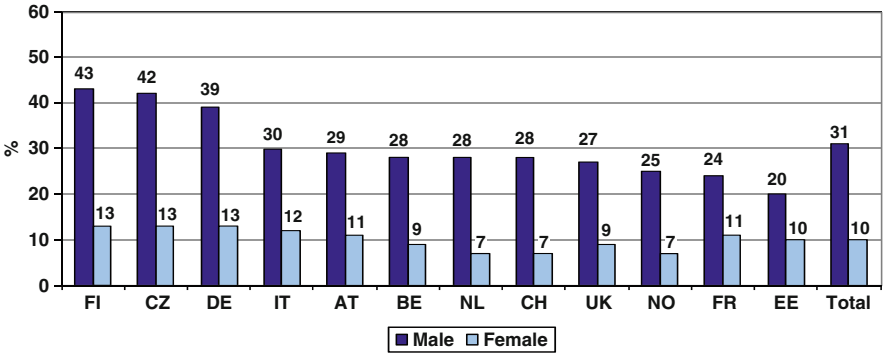

Fig. 3.3 Graduates working as science and technology experts by country and gender (percent)

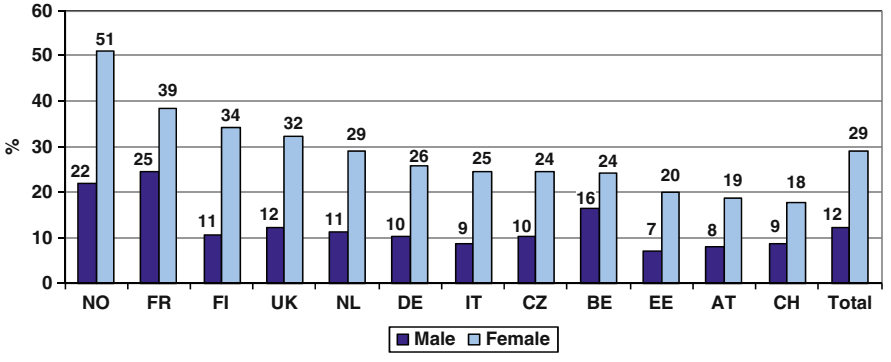

Fig. 3.4 Graduates working as semi-professionals by country and gender (percent)

3.2.3 Employment Conditions

Table 3.4 provides an overview of some selected employment conditions of the six types of professions at the time of the survey, which is about five years after graduation. Most graduates work full-time (81%), but this proportion is clearly lower in the semi-professions (62%). Closer inspection of the data (not included in the table) reveals that, on average, graduates are working 42 hours per week in total. Managers and classical professionals work the longest hours (47 hours), and semi-professionals the shortest (38 hours). The vast majority of graduates have unlimited term contracts (80%), but a remarkably lower proportion of graduates with this type of contract can be found among the classical professions (60%). This might be explained mainly by the fact that medical doctors are often still in their training phase on a temporary contract. About one in five of classical professions are self-employed. In other types of profession, self-employment is relatively rare (on average 11%).

Some of the professions are concentrated in a few *economic sectors.* For example, 64% of semi-professionals are employed in the education sector, and an additional 27% work in the health and social work sector (see Table 3.5). The health

Table 3.4 Selected aspects of employment and work by type of profession (percent)

	Non-prof.	Business & soc.	Science & techn.	Semi-prof.	Class. prof.	Manager	Total
Full-time employed	79	85	91	62	89	92	81
Unlimited term contract	81	86	86	69	60	93	80
Self-employed	9	9	10	7	24	11	11

Table 3.5 Economic sector by type of profession (percent)

	Non-prof.	Business & soc.	Science & techn.	Semi-prof.	Class. prof.	Manager	Total
Agriculture, hunting and forestry	3	1	2	0	0	1	1
Fishing	0	0	0	0	0	0	0
Mining and quarrying	0	0	1	0	0	1	0
Manufacturing	12	14	25	1	1	21	13
Electricity, gas and water supply	1	1	2	0	0	1	1
Construction	2	1	7	0	0	4	2
Wholesale/retail trade; repairs	10	6	2	1	7	11	5
Hotels and restaurants	2	1	0	0	0	2	1
Transport, storage and communications	8	4	6	0	1	7	4
Financial intermediation	11	11	3	0	3	8	5
Real estate, renting, bus. activities	13	21	36	2	23	16	19
Public admin., defence; soc. secur.	14	14	6	2	12	10	9
Education	7	5	6	64	3	5	19
Health and social work	10	13	3	27	46	7	17
Other commun., soc., pers. serv.	7	8	2	3	4	6	5
Extraterritorial organizations/bodies	0	0	0	0	0	0	0

sector is the most important sector for the classical professions (46%). The other types of profession are spread over a broader range of sectors.

3.3 The Role of Professional Knowledge

3.3.1 Required Field of Study and Level of Education

We now turn to the question of the horizontal match between study and work, in other words the extent to which graduates' field of study is appropriate for their job. Across all countries and occupations, 85% of graduates work in a job for which their own or a related field is considered most appropriate, while the remaining 15% report that a different field or no particular field is appropriate. We can use this indicator to establish the degree to which the various types of profession are highly specialized. Figure 3.5 shows the results.

The most highly specialized types of profession are the semi-professions and especially the classical professions, where respectively 49% and 81% of graduates report that "exclusively their own field" is most appropriate to their work. Most other graduates working in these groups report that their own or a related field would be most appropriate. Managers are much less specialized, with only 17% reporting that exclusively their own field was most appropriate, with the same percentage reporting that a different field or no particular field was most appropriate. Forty-five percentage of "non-professional" graduates work in jobs with no relation with their field of study.

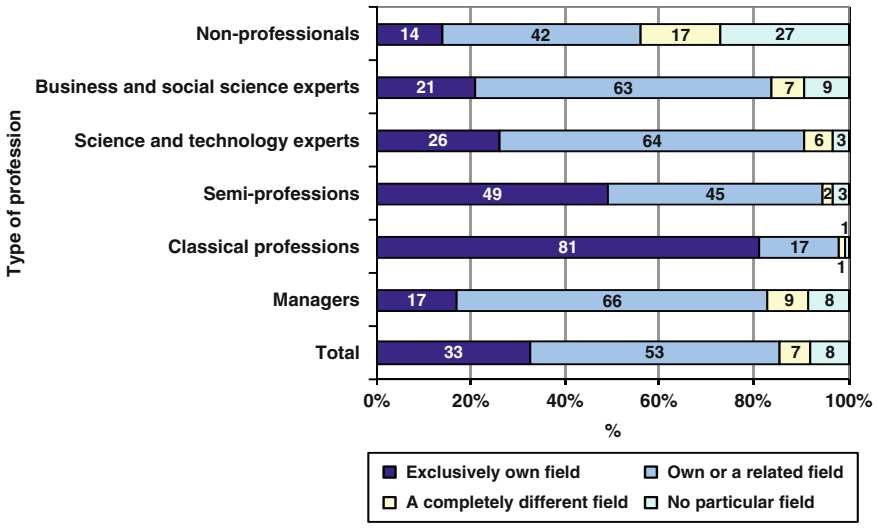

Fig. 3.5 Appropriate field of study by type of profession (percent)

3.3.2 Higher Education and Professional Training – How Long Does it Take to Become an Expert?

Higher education does not usually prepare graduates for the specific work tasks which they are expected to perform. Even for programmes that are targeted at specific occupations such as engineering, it is not possible to anticipate in advance all the work tasks graduates will need to perform. This means that graduates enter the labour market lacking many of the skills that are needed for them to perform as an expert in their job. Training on the job is needed in all occupations. Fortunately, graduates are always to some extent generalists, in the sense that they possess a broad range of knowledge and skills, including generic skills that help them adapt to the work situation and acquire the specific skills through on the job training. How long it takes for graduates to become experts is an open question.

To gain an impression of this, working graduates were asked, "How much time would it take for an average graduate with the relevant educational background to become an expert in this kind of work?" The majority of graduates (61%) reported that it would take from one to five years working in their job in order to become an expert. Around a quarter of graduates reported that a shorter training period would be required (11% for six months or 15% for 7 to 12 months). Thirteen per cent of graduates reported that it would take longer than five years to become an expert. When we convert the answer categories into estimated years,[2] we see that it takes an average of 3.3 years for both first- and second-level graduates across all countries to become an expert (see Fig. 3.6). However, there are large differences between countries and in some countries between first- and second-level graduates. Norwegian graduates at both levels reported the longest training periods, and Norway was

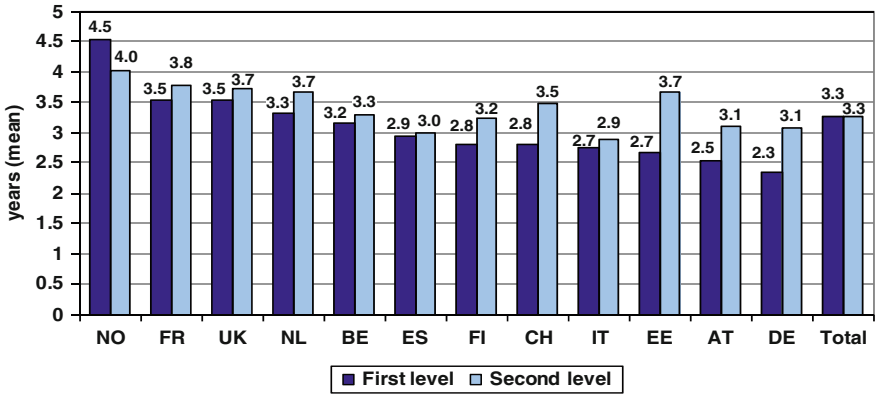

Fig. 3.6 Time to become an expert, by country and type of study programme (arithmetic mean)

[2]Using the following conversion scheme: 6 months or less = 3 months; 7–12 months = 9 months; 1–2 years = 18 months; 3–5 years = 48 months; 6–10 years = 96 months; more than 10 years: 144 months.

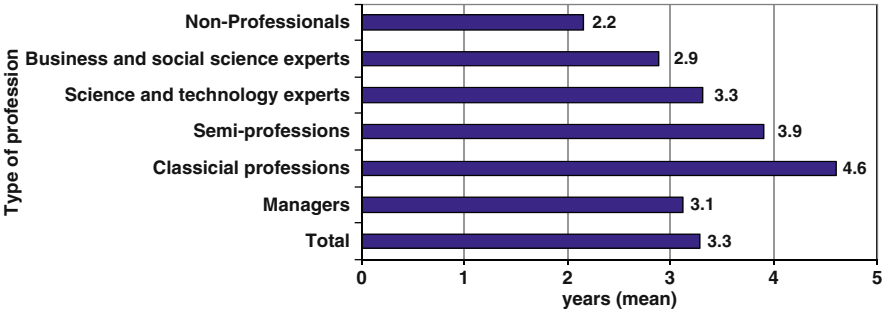

Fig. 3.7 Time to become an expert, by type of profession (arithmetic mean)

also the only country in which first-level graduates reported a longer average training period than second-level graduates. Austrian and German graduates, especially those at the first level, reported the shortest training periods.[3]

Figure 3.7 shows the average time needed to become an expert by type of profession. The classical professions have by far the longest training period after graduation, (4.6 years) followed by the semi-professions (3.8 years).

By combining nominal study duration in higher education and the estimated time needed on the job to become an expert, we can gain an impression of the total education and training time required to achieve the status of expert. On average this total education and training time is 8.2 years for second-level programmes and 6.5 years for first-level programmes (see Fig. 3.8). For first-level programmes, there seems to be something of a trade-off between education and training, with graduates in some countries with a relatively short nominal study duration, such as the UK and Norway, apparently compensating this by taking a longer time on the job to become an expert. In Germany, Austria and Estonia the opposite appears to be true, with more time spent in education and less training time required on the job. For second-level programmes there does not appear to be any such trade-off.

3.3.3 Additional Training

Five years after graduation, a majority of graduates still engage in further training. About two thirds undertook work-related training in the past 12 months (see Table 3.6). The highest participation rate is in the classical professions (78%). Most graduates undertook further training to update their knowledge for their present work. This applied especially to the semi-professionals and classical professionals. Around one in five undertook further training to enhance their career. A relatively high proportion of managers undertook training for this reason. A few graduates

[3] Across all countries, the longest training periods were reported by graduates from the fields of education (teacher training) and health and welfare.

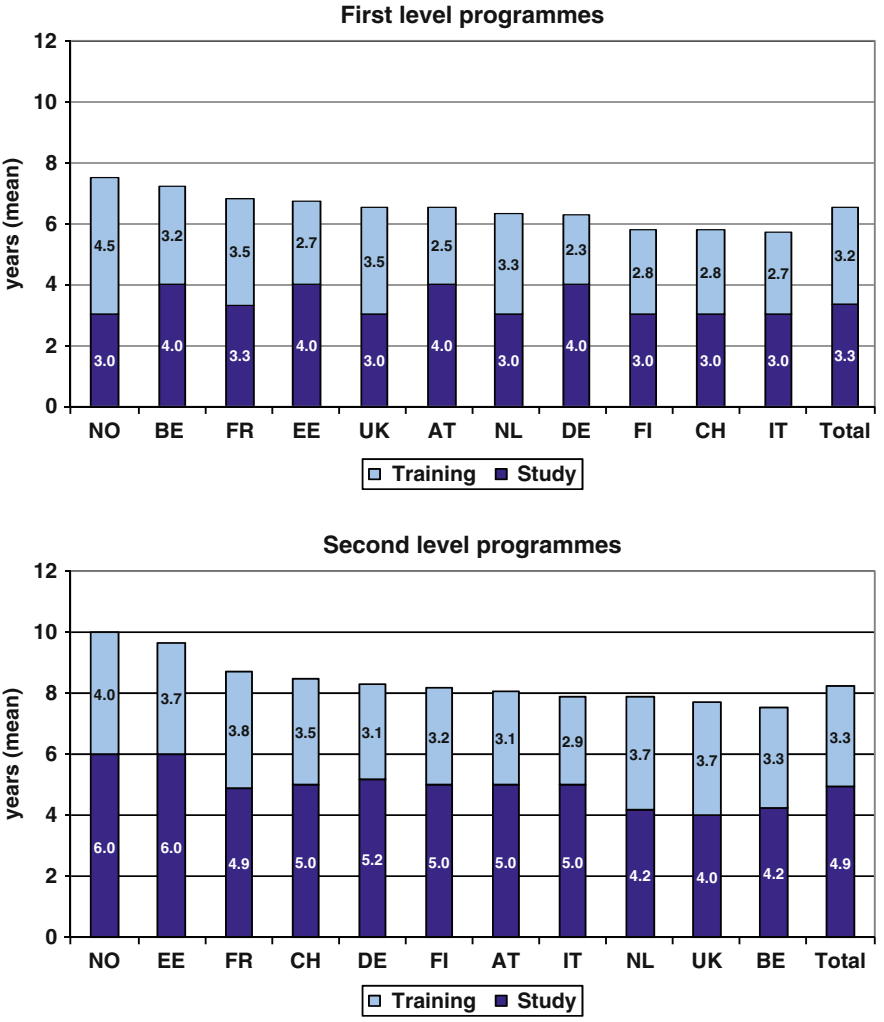

Fig. 3.8 Duration of study and training after graduation by type of study programme, country and field of study (arithmetic mean)

were motivated by other reasons, such as to prepare for work in another field or for self-employment. This was especially the case for non-professionals.

3.3.4 Professional Expertise

Higher education produces knowledge and skills which are required by the economy, which is often used to justify the expansion of higher education. But do the experiences of recent higher education graduates support this view? Are

Table 3.6 Work-related training in the past 12 months by type of profession (percent)

	Non-prof.	Business & soc.	Science & techn.	Semi-prof.	Class. prof.	Manager	Total
Work-related training in past 12 months	51	62	60	66	78	64	63
Reasons for training							
To update knowledge for present work	62	68	71	75	73	64	70
To enhance career	23	23	20	17	16	28	21
Other reason	14	8	9	8	11	8	10

there indications of a growing demand for professional expertise? And how is professional expertise related to other dimensions of professional competence?

In the REFLEX study, the graduates were asked to rate their own level of competence for a list of 19 items, on a scale ranging from 1 = "not at all" to 7 = "very high". Graduates were also asked to rate the level at which the same competences were required in their current work. In Chapter 2, 17 of the 19 competence items were used to create indicators for five key demands that higher education graduates are particularly exposed to. The five demands were professional expertise, functional flexibility, innovation and knowledge management, mobilization of human resources and international orientation. The following three items were treated as indicators of the level of professional expertise (see Chapter 2 for the operationalization of the other four demands):

– Mastery of your own field or discipline
– Analytical thinking
– Ability to assert your authority

Figure 3.9 shows the mean percentage of graduates who report a moderate to high required level of competence (answers 5 through 7 on the 7-point scale) on the items associated with the four demands.

As was made clear in Chapter 2, it is not professional expertise that is most often required by graduates, but rather the competences associated with mobilization of human resources. As we might expect, especially managers are expected to be competent at mobilizing their own or others' human resources. More surprising is that this group is also most often expected to show a high level of competence in terms of innovation and knowledge management, professional expertise and international orientation (although the latter competence is only required at a high level of a little over half of all managers). With the exception of non-professionals, who show the lowest required levels in all areas, the differences between the other types of profession are generally quite small. A partial exception is formed by the relatively low percentage of classical professionals and semi-professionals who are required to be highly proficient in terms of innovation and knowledge management.

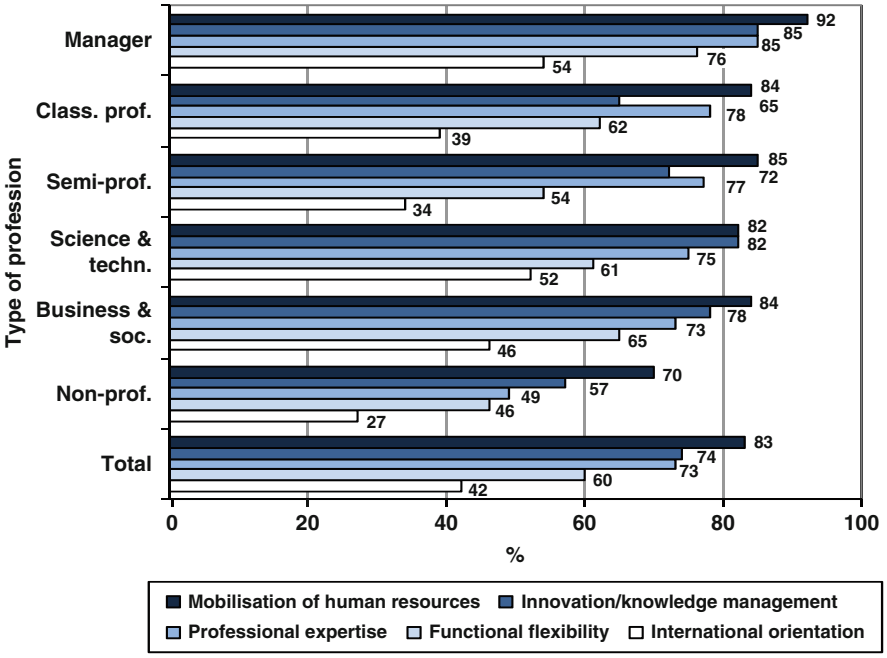

Fig. 3.9 Required competences by type of profession (percent high level required)

Figure 3.10 shows the proportion of graduates per type of profession that experience shortages or surpluses in these five domains.

In general, the most striking difference is between non-professionals and the other professional groups: non-professionals often have a surplus in all five areas, and rarely have a shortage. This applies especially to international orientation, an area in which the other types of profession also often experience a surplus. In other respects, the competences of all groups except the non-professionals are quite well matched to the requirements of their work. There are some slight exceptions, such as the relatively high proportion of semi-professionals and classical professionals who experience a surplus of competences related to innovation and knowledge management, the relatively high proportion of classical professionals experiencing a shortage of professional expertise and the low proportion of managers with a surplus of competences related to mobilization of human resources

3.4 Professional Role and Professional Identity

3.4.1 Aspects of the Professional Role

The REFLEX study allows us to highlight some elements of the professional role of higher education graduates. We look at indicators on five dimensions of this role,

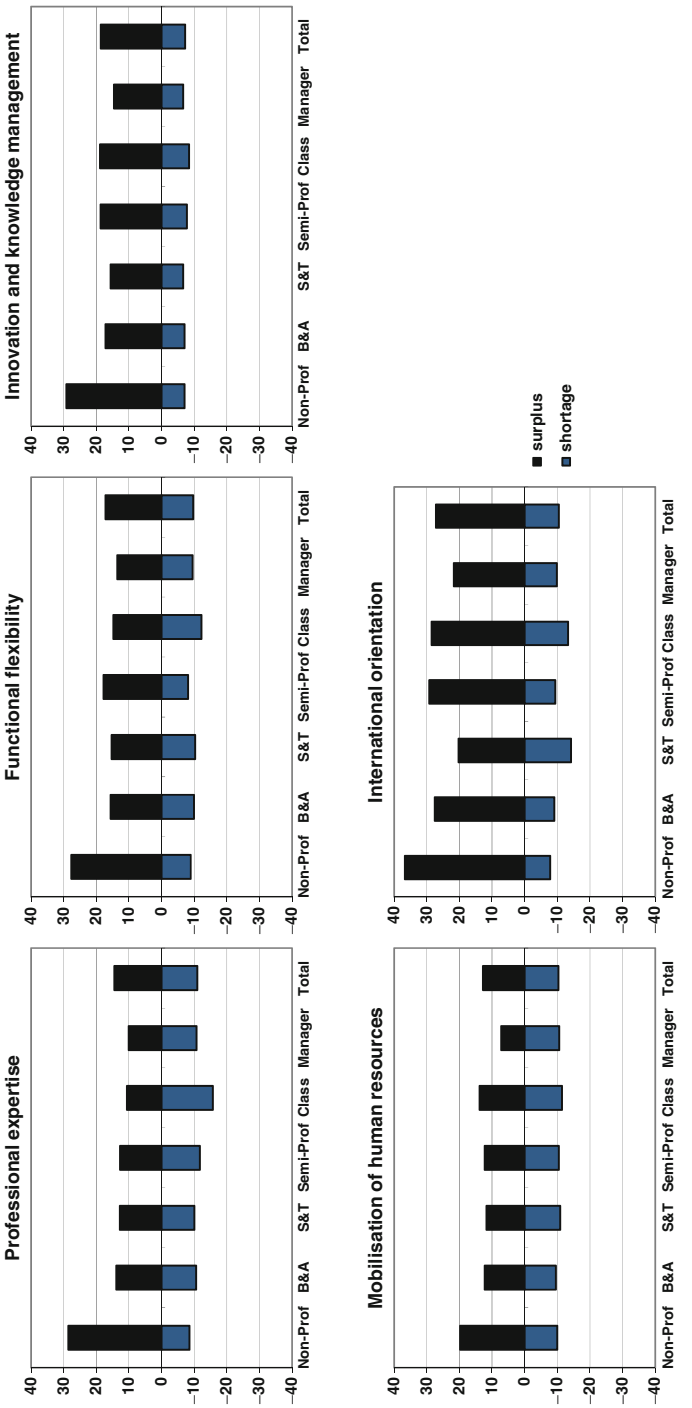

Fig. 3.10 Shortages and surpluses in competences by type of profession

Table 3.7 Professional role by type of profession (percent; responses 4 and 5)

	Non-prof.	Business & soc.	Science & techn.	Semi-prof.	Class. prof.	Manager	Total
Takes account of professional ethics	57	72	56	76	84	71	69
Professional contacts							
Authoritative source of advice	48	62	61	49	55	77	58
Informs colleagues on new developments	38	51	51	45	46	65	49
Establishes contacts with external experts	24	38	35	32	32	53	35
Work autonomy							
Decides how to do own job	71	84	83	87	74	92	83
Sets goals for own work	60	78	74	84	71	91	77
Performance assessable by others	59	67	66	56	68	66	63
Performance monitored by supervisor	41	41	37	33	45	39	39
Responsibility							
Sets goals for organization	18	23	19	23	24	50	24
Decides work strategies for organization	18	23	21	23	24	51	24
Interdependency							
Results dependent on performance of others	49	51	53	42	41	74	50
Results others dependent on own performance	46	49	57	40	45	70	50
Assesses work of others	21	28	31	19	23	64	29
High damage potential	58	62	62	56	77	73	62

namely professional ethics, professional interaction with colleagues, work autonomy, responsibility, interdependency and damage potential. Table 3.7 displays the percentages of graduates indicating that the characteristic in question applied to their work situation (scores 4 and 5 on a scale from 1 “not at all” to 5 “to a very high extent”).

A majority of graduates in all professional groups take professional ethics into account in their work and have a high damage potential, but this is clearly most important in the classical professions. In other respects, however, this group does not have a particularly “professional” profile. These graduates score rather low in terms of interacting professionally with colleagues, have surprisingly low work autonomy, have only average levels of responsibility for the organizations in which they work and show little interdependency with co-workers in their organization. Only non-professionals score clearly lower on all these points. The position of managers is striking. Graduates in this group show high levels of professional interaction, autonomy, responsibility, and interdependency.

3.4.2 Work Orientations

In the survey, respondents were asked to rate the importance of several aspects of work on a scale from 1 "not at all" to 5 "very important". They were also asked to indicate to what extent this characteristic applied to their situation (on a scale from 1 "not at all" to 5 "to a very high extent"). Table 3.8 displays the percentages of graduates rating 4 or 5 on each of these aspects in terms of importance and realization.

The aspects of work that graduates most often found important are the opportunity to learn new things (92%), work autonomy (85%), job security (81%), new challenges (81%) and enough time for leisure activities (77%). The differences by type of profession are generally rather small. Managers are less likely than most of the other groups to place importance on job security, time for leisure activities, the chance to combine work with familiy tasks and the chance to do something useful for society, and with the exception of job security are relatively less likely to realize these aspects in their work. By contrast, they find new challenges, career prospects, earnings and status more important than do the other groups, and are

Table 3.8 Work orientations and situation by type of profession (percent; responses 4 and 5)

	Non-prof.	Business & soc.	Science & techn.	Semi-prof.	Class. prof.	Manager	Total
Work orientation							
Opportunity to learn new things	89	93	92	91	91	93	92
Work autonomy	81	85	83	85	88	86	85
Job security	81	77	79	87	81	71	80
New challenges	76	84	81	77	79	89	81
Enough time for leisure activities	78	76	75	79	76	70	76
Chance to combine work with family tasks	71	69	65	78	73	62	70
Good career prospects	61	69	67	54	65	76	65
High earnings	58	65	66	55	67	76	63
Chance to do something useful for society	59	57	48	77	69	51	61
Social status	37	44	39	43	46	50	43
Realization in current work							
Opportunity to learn new things	43	68	68	68	72	70	66
Work autonomy	63	77	77	78	74	79	75
Job security	59	65	61	68	64	65	64
New challenges	38	58	61	60	61	70	58
Enough time for leisure activities	52	49	43	51	35	39	47
Chance to combine work with family tasks	48	46	40	57	35	36	46
Good career prospects	22	38	36	26	39	49	34
High earnings	18	32	30	20	36	43	29
Chance to do something useful for society	37	43	33	76	65	38	49
Social status	23	42	37	35	61	52	40

relatively successful at realizing these aspects. Semi-professionals are almost a mirror image of managers in terms of these aspects, placing relatively high importance on job security, chance to combine work with family tasks and the chance to do something useful for society, less on career and earnings, and being relatively successful at realizing the former cluster of work aspects and relatively unsuccessful at realizing the latter. Non-professionals place somewhat less importance than average on challenges, earnings and status, but otherwise do not differ greatly from the other groups in terms of what they find important in work. They are, however, much less successful than average at realizing all aspects except time for leisure and the chance to combine work and family tasks.

We also asked graduates to what extent they were satisfied with their current work. In general, the level of job satisfaction among graduates is high (69% "satisfied"), and with the exception of non-professionals the differences between the different types of profession are quite small. Non-professionals are clearly less often satisfied and more often unsatisfied with their work. Semi-professionals, classical professionals and managers are most often satisfied with their work (see Fig. 3.11).

To find out whether graduates working in the different professions have the same idea of what constitutes a satisfying job, a series of multiple regression analyses were conducted with job satisfaction as the dependent variable and characteristics of the job as predictors. These analyses were done separately for the six types of professions. Table 3.9 shows that the three factors that are most relevant for job satisfaction in every type of profession are work autonomy, use of knowledge and skills and a successful career (e.g. high income). Working conditions which allow graduates time for leisure activities or family are also important for job satisfaction, particularly for semi-professionals and classical professionals. Aspects of the professional role (professional ethics and contacts) were also important for most groups (especially classical professionals), but not for non-professionals.

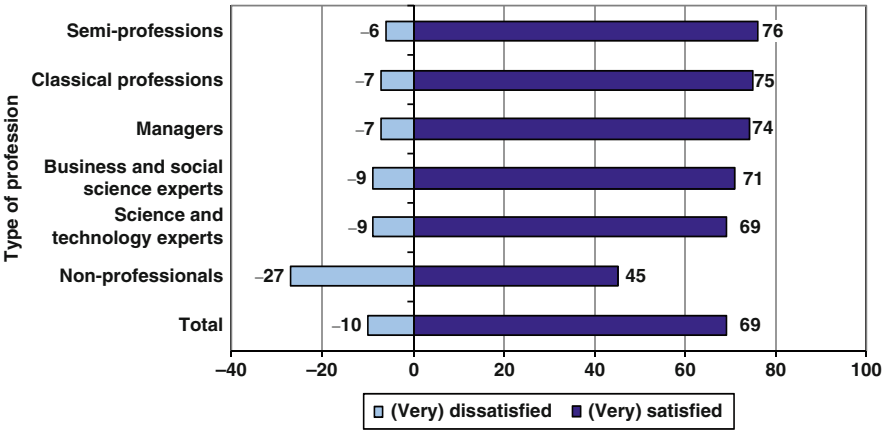

Fig. 3.11 Satisfaction with current work by type of profession (percent)

Table 3.9 Job satisfaction and characteristics of work by type of profession (standardized coefficients, beta; OLS regression)

	Non-prof.	Business & soc.	Science & techn.	Semi-prof.	Class. prof.	Manager
Work autonomy	0.301	0.274	0.265	0.228	0.192	0.285
Use of knowledge and skills	0.259	0.243	0.205	0.216	0.263	0.181
Status/career	0.174	0.169	0.223	0.149	0.196	0.195
Leisure time/family	0.052	0.056	0.055	0.134	0.104	0.086
Professional role	ns	0.072	0.045	0.044	0.094	0.054
Explained variance (R2)	0.37	0.28	0.27	0.22	0.25	0.26

Dependent Variable: Job satisfaction (F13).
ns = not significant at the 5% level.

3.5 Professions and Power

In this section we describe different aspects of the professional types in terms of dimensions that characterize their (market) power: income, selectivity of their HE programme, programme characteristics, self-employment, strength and type of competition and damage potential.

3.5.1 Income

The *income* of graduates may indicate to some extent the demand society places on their knowledge and skills according to the human capital theory. But the theory of professions also teaches us that income differences may be partially explained in terms of power and strategies of market closure. Figure 3.12 shows the differences between the different types of professions and also between female and male graduates in each type.

The winners in terms of income are clearly the "managers" and the "classical professions". The income of semi-professionals is similiar to that of the non-professionals. In all professions the income of female graduates is 20–30% lower than that of males.

The organizational context in terms of public versus private sector and size of organization affects income differences to a great extent (see Table 3.10). The "business and administrative experts", the "science and technology experts" and "managers" have a higher income when they are employed in the private profit sector, while the "semi-professions" and the "classical professions" employed in the public sector have a higher income than their colleagues in the private profit sector. In general the size of the organization is positively correlated with income: the bigger the organization the higher the income of the graduates. But for "business and administrative experts", "science and technology experts" and managers in the public sector and semi-professionals and classical professionals in the private sector, the

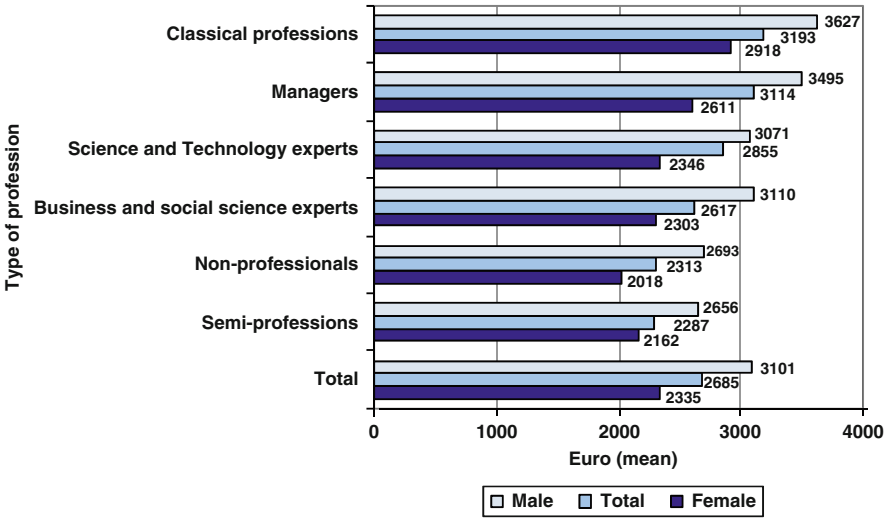

Fig. 3.12 Monthly income by type of profession and gender (arithmetic mean; only full-time employed graduates)

Table 3.10 Income by economic sector, type of profession and size of organization (arithmetic mean; only full-time employed graduates)

	Non-prof.	Business & soc.	Science & techn.	Semi-prof.	Class. prof.	Manager	Total
Public sector							
1–49 employees	1,936	2,310	2,388	1,799	3,194	2,309	2,190
50–999 employees	2,086	2,263	2,146	2,307	3,205	2,234	2,352
1,000+ employees	2,336	2,503	2,788	2,471	3,461	2,871	2,670
Private profit sector							
1–49 employees	2,151	2,346	2,595	2,473	2,863	2,698	2,509
50–999 employees	2,244	2,487	2,885	2,011	3,645	3,253	2,716
1,000+ employees	2,744	3,304	3,343	2,707	3,215	3,960	3,325

relationship does not seem to be linear, with graduates working in mediums sized organizations showing the lowest incomes in the first four groups and the highest in the last group. The best off are managers in big private companies, who earn an average income of almost 4,000 Euros.

3.5.2 Selectivity of Higher Education and HE Programmes?

We already saw in Fig. 3.5 that the classical professionals are outstanding in terms of the proportion working in jobs requiring exclusively their own field. This indicates

Table 3.11 Parents with academic background and highest qualification before entering higher education and further study by type of profession (percent)

	Non-prof.	Business & soc.	Science & techn.	Semi-prof.	Class. prof.	Manager	Total
Parents with academic background	45	48	46	47	61	56	49
General secondary education highest track	69	69	66	77	91	73	73
Current highest education level:							
First level	37	44	44	49	12	47	41
Second level	62	54	52	47	78	51	55
Doctorate or equivalent	1	2	4	5	10	2	4

the high extent to which such professions have succeeded in demarcating their professional domain. It is interesting to see whether a similar demarcation is already visible at an earlier stage, in terms of parental background, educational career prior to higher education or the highest level of higher education achieved by graduates. Table 3.11 shows this for the six types of profession.

It appears that the classical professions are indeed more exclusive than the other professional groups, not only in terms of field of education, but also in terms of the parental background, secondary education and current highest level of education of graduates working in these professions.

The higher education programme characteristics described by graduates are quite different between the types of profession (see Table 3.12). For instance, classical professionals most often graduated from demanding and/or prestigious programmes, the content of which is familiar to their employers. Their programmes

Table 3.12 HE programme characteristics by type of profession (percent)

	Non-prof.	Business & soc.	Science & techn.	Semi-prof.	Class. prof.	Manager	Total
The programme was generally regarded as demanding	51	48	64	52	79	52	55
The programme was academically prestigious	29	36	38	29	67	38	37
The programme was vocationally orientated	31	36	41	48	40	37	39
Employers are familiar with the content of the programme	24	34	42	46	62	38	40
There was freedom in composing your own programme	29	31	25	26	14	30	27
The programme had a broad focus	56	62	59	50	47	63	57

Table 3.13 Self-employment by type of profession (percent; responses 4 and 5)

	Non-prof.	Business & soc.	Science & techn.	Semi-prof.	Class. prof.	Manager	Total
Self-employed	9	9	10	7	24	11	11

Table 3.14 Strength and kind of competition, by type of profession (percent)

	Non-prof.	Business & soc.	Science & techn.	Semi-prof.	Class. prof.	Manager	Total
Strong competition	58	58	71	29	51	69	55
Competition mainly by price	13	10	13	3	6	13	9
Competition mainly by quality	39	43	43	36	43	46	41

were less often described as having a broad focus, and they had little freedom to compose their own programme. Semi-professionals rarely consider their study programme to be academically prestigious, but are more likely than graduates in the other groups to describe their programme as vocationally oriented.

Only a minority of 10% of graduates are self-employed (see Table 3.13), but this proportion is relatively high among classical professionals

Table 3.14 shows the extent and type of competition the organizations employing graduates in the different professional groups are exposed to.

There are large differences between the groups in the percentage reporting strong competition. Managers and science and technology experts are most often exposed to strong competetition. Contrary to what we might expect, a slim majority of classical professionals also reports strong competition. Only the semi-professions appear to be largely shielded from competition in their work. Competition is much more oriented towards quality than price, with especially semi-professionals and classical professionals rarely competing by price.

3.6 Discussion of Results

The vast majority of higher education graduates approached in the REFLEX survey are working as managers or professionals according the ISCO classification of their job title. However, the stereotypical image of the "classical professions" does not describe the situation of most graduates. The typical characteristics attributed to those working in such professions, such as independent client-professional relationships, and exclusivity of one's own field of study, only apply to a minority of graduates, and even the work of many "classical professionals" is monitored by their supervisors. Consequently, one of the main conclusions of this chapter is

that the professional work of higher education graduates is characterized by a high degree of differentiation.

To explore this differentiation, a typology of professional types was developed in which managers, semi-professionals, science and technology experts, business and social science experts and non-professionals are distinguished in addition to the – relatively small – group of classical professionals. Using this typology, we explored differences between groups of graduates according to the three key concepts of knowledge, organization and power. Although a majority of graduates in all groups, even the non-professionals, were working in jobs that showed some relation to their field of study, real exclusivity of knowledge turned out to be only dominant among the group of classical professionals, and to a lesser extent the semi-professionals. These groups also showed the longest time required working on the job after graduation in order to achieve the full status of expert in their field, and had the highest levels of investment in work-related training in the last 12 months. However, the managers had the highest levels of self-reported competences of all the professional types, including competences related to professional expertise.

Turning to the concept of organization, it appeared that classical professionals and semi-professionals were of all groups the most likely to take account of professional ethics in their work, and the former group showed the highest level of damage potential. However, in other respects managers scored higher on aspects of work organization often attributed to classical professions, such as contacts with professional colleagues relating to knowledge and expertise and work autonomy, as well as on aspects more traditionally associated with the role of managers, such as interdependency and responsibility. The differences between professional groups in terms of work orientations were surprisingly small, although managers placed relatively little weight on aspects such as security, less time and work-life balance, and more on such things as new challenges, career prospects, earnings and status, while the reverse was true of semi-professionals.

The classical professions score quite highly on aspects related to power, such as income and absence of competition, although on the latter aspect there are still around half of all classical professionals who report that they work in an organization that is subject to strong competition. Only the group of semi-professionals appears to be really sheltered from competition, with less than a third of graduates in this group reporting high levels. Competition in all groups is much more based on quality than on price. Classical professionals were most likely to be self-employed, to come from households in which one or both parents had a higher education degree, to have entered higher education on the basis of a diploma in the highest track of general secondary education and to have achieved a second-level degree or doctorate in higher education. They were also most likely to report that their higher education programme was demanding and/or prestigious, and that employers were familiar with its content, but less likely than other professional types to report that it has a broad focus and/or gave them much freedom to compose their own programme.

Appendix: Mapping of 3-Digit ISCO Occupational Codes to Typology of Professions

Non-professionals	Business and social science professionals	Science and technology professionals	Semi-professionals	Traditional professionals	Managers
400 Clerks	200 Professionals	210 Physical, mathematical and engineering science professionals	223 Nursing and midwifery professionals	222 Health professionals (except nursing)	100 Legislators, senior officials and managers
500 Service workers and shop and market sales workers	240 Other professionals	211 Physicists, chemists and related professionals	230 Teaching professionals	242 Legal professionals	110 Legislators and senior officials
600	241 Business professionals	212 Mathematicians, statisticians and related professionals	231 College, university and higher education teaching professionals	246 Religious professionals	111 Legislators and senior government officials
700 Craft and related trades workers	243 Archivists, librarians and related information professionals	213 Computing professionals	232 Secondary education teaching professionals		114 Senior officials of special-interest organizations
800 Plant and machine operators and assemblers	244 Social science and related professionals	214 Architects, engineers and related professionals	233 Primary and pre-primary education teaching professionals		120 Corporate managers
900 Elementary occupations	245 Writers and creative or performing artists	220 Life science and health professionals	234 Special education teaching professionals		121 Directors and chief executives
	246 Religious professionals	221 Life science professionals	235 Other teaching professionals		122 Production and operations managers
	247 Public service administrative professionals	300 Technicians and associate professionals			123 Other specialist managers
	340 Other associate professionals				130
	341 Finance and sales associate professionals				

(continued)

Non-professionals	Business and social science professionals	Science and technology professionals	Semi-professionals	Traditional professionals	Managers
	342 Business services agents and trade brokers	310 Physical and engineering science associate professionals	243 Archivists, librarians and related information professionals		
	343 Administrative associate professionals	311 Physical and engineering science technicians	322 Health associate professionals (except nursing)		
	344 Customs, tax and related government associate professionals	312 Computer associate professionals	323 Nursing and midwifery associate professionals		
	345 Police inspectors and detectives	313 Optical and electronic equipment operators	330 Teaching associate professionals		
	346 Social work associate professionals	314 Ship and aircraft controllers and technicians	331 Primary education teaching associate professionals		
	347 Artistic, entertainment and sports associate professionals	315 Safety and quality inspectors	332 Pre-primary education teaching associate professionals		
	348 Religious associate professionals	320 Life science and health associate professionals	333 Special education teaching associate professionals		
	11 Armed forces		334 Other teaching associate professionals		

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Chapter 4
"Being Flexible": Graduates Facing Changes in Their Work Environment

Julien Calmand, Michela Frontini, and Michele Rostan

In the 1990s, greater emphasis was placed on flexibility in the graduate labour market, from two different perspectives. On one hand, it was observed that fewer graduates could expect to experience a smooth and rapid transition from higher education to "regular" or "standard" employment with full-time and unlimited-term contracts. More and more graduates were expected to become petit entrepreneurs, finding multiple niches where they could sell their competences on the basis of part-time, short-term or multiple contracts, or to get involved in semi-entrepreneurial activities. This view stressed the increasing precariousness of graduate employment, the loss of job security and the weakening of graduates' bargaining position.

On the other hand, the growing importance of flexibility was also seen as an indication of an expanded set of graduates' opportunities. According to this view, graduates are not just victims of a changing set of circumstances, but can take advantage of the new situation by developing a willingness and an ability to deal with changes in a positive way, seeing changes as windows of opportunities rather than as threats, learning and trying new things, using their work as a tool for acquiring new competences through experience, and being constantly alert to new work opportunities in the external labour market. In this chapter we take both perspectives into account in describing what "being flexible" means in the European graduates labour market and in the work environment at large in the early twenty-first century. We distinguish two broad forms of flexibility. On one hand, we look at the need for flexibility within jobs – so-called internal or functional flexibility – whereby graduates anticipate and adapt to changes in the content of their jobs. On the other hand, we examine the need for flexibility in changing employers – so-called external or numeric flexibility – whereby graduates are faced with the need to find new (self-) employment opportunities in the external labour market.

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4.1 The Changing Work Environment of European Graduates

In Europe, both firms and states are facing – and have faced in recent decades – substantial changes in their environment. As a result of a number of developments – the industrialisation and economic growth of developing countries, the increasing openness of national economies, the extension of trade, the deepening of competition, the growth of personal and family incomes, the increasingly refined and diversified taste of consumers – markets have become more segmented and unstable. Social processes such as the ageing of the population and increasing migration, combined with budget constraints at both the domestic and European levels, led to a restructuring of welfare states, and a change in the supply of public services. Further, technological and organisational innovations have had, and continue to have, an impact on the way in which firms, states and professions operate. The ongoing production of new knowledge and its introduction in the economy through technical and organisational innovations (see the discussion on the knowledge economy and knowledge societies in the next chapter) enhances the role of highly qualified labour force in the economy and deepens the occupational division of labour, fostering the creation of new occupations and professions especially in the field of knowledge-driven services. New knowledge and innovations also directly or indirectly cause the transformation of existing occupations and professions, and bring about a rapid obsolescence of existing knowledge and a need for re-training, higher education qualifications and lifelong learning. In Europe, the growing importance of information and communication technologies has especially been considered to be a factor necessitating a radical reform of the education system (European Council, 2000).

In order to adapt to a changing, more complex and often highly uncertain environment, resorting to flexibility – that is, to the rapid readjustment of productive factors or resources in order to seize opportunities provided by technological innovation and increasingly segmented and unstable markets (Trigilia, 2002) – is a way out. Organisations – both economic and non-economic – can deal with a rapidly changing environment by making flexible use of their resources, especially of human resources.

From the employers' side, the flexible use of human resources can entail different possibilities: (1) adjusting the volume and composition of the labour force to environmental changes; (2) shifting workers from one job to another within existing organisations and changing the content of job tasks; (3) rewarding labour differently according to real or supposed differences in labour productivity, and to the business cycle. These possibilities refer to three different dimensions of flexibility: external (or numeric) flexibility; internal (or functional) flexibility; and wage flexibility (Reyneri, 2002). In this chapter we will focus only on the first two forms of flexibility.

External flexibility implies the transformation of both self-employment and employment relations. On the one hand, the assignment of phases or functions of productive processes to others (outsourcing) fosters the extension of a network of relations not only with other organisations, but also with self-employed

workers and professionals. The search for more external flexibility can lead to greater job insecurity and more casual work, but can also trigger or accelerate the process of professionalisation of work: new kind of professions can be established beside existing regulated professions. Further, the search for external flexibility can contribute to a blurring of the distinction between employment and self-employment, and can sustain the growth of micro-firms making the field of self-employment more complex. A higher demand for flexibility by the economic system may change the proportions of specific types of self-employed workers.

On the other hand, normative and contractual constraints regulating hiring and firing are modified, and non-standard employment relations (i.e. deviating from full-time permanent employment within a single organisation) increase. The need to readjust the volume and the composition of the labour force may result in shifts from one employer (and thereby sometimes one occupation and/or economic sector) to another and from employment to unemployment, more use of part-time or fixed-term contracts, more geographical mobility and multiple jobs held at the same time.

Functional flexibility refers to the drive towards flexibility within single organisations entailing changes in the workplace. It relies on two different sets of conditions. First there are "negative" conditions, that is, the absence of constraints preventing workers being shifted from one job to another and the content of job tasks being changed. Second there are "positive" conditions, that is, workers' possession of multiple competences and skills, and their willingness to upgrade their skills, to participate in re-training processes or activities and to adapt to frequent changes in working conditions. Among the positive conditions, knowledge and competences possessed or acquired by workers and their value orientations play a major role.

Functional flexibility is regarded as extremely important because it relates to individuals – and, especially, to graduates – at all stages of their working life. As a consequence, graduates need to develop the ability to cope with changes, to take up challenges not directly related to their own field of expertise and to quickly acquire new knowledge and new skills (Allen & van der Velden, 2005; Schmid, 2000).

It is clear that the exposure of graduates to these two forms of flexibility requires some major adaptive skill. However, graduate workers don't only adapt or react to changes in their working environment, but can also change it. This can happen in at least two ways. Firstly, graduates can actively contribute to changing their working environment, acting as standard-bearers or promoters of innovation within their workplace (this is the topic of the next chapter). Secondly, graduates can simply change jobs or change their employment conditions as a means to acquiring new knowledge, competences and experiences in order to attain a (more) satisfactory working life. This applies especially to young people for whom obtaining a higher education degree is a major step in the transition to adulthood, and often also the starting point of a period of exploration of the world of work through mobility and adaptation (the topic of this chapter).

4.2 Outline of the Chapter

The rest of the chapter is divided into three broad parts. The first part, comprising Sections 4.3 through 4.7, focuses on external flexibility; that is, on changes graduates experience in their work and employment situation during the first five or six years after graduation. First, an overview of the changes in graduates' work and employment situation is provided. Second, two different aspects of external flexibility are discussed. The first of these, employment mobility – that is, shifting from one employer to another – is considered as one of the most important kinds of change graduates experience in their early career. The relationship between employment mobility and competence development is discussed, and the impact of employment mobility on graduates' pursuit of job satisfaction five or six years after graduation is analyzed. The second aspect of external flexibility we consider is temporary work, and we aim to identify determinants of graduate temporary work at the time of the survey.

The second part of the chapter, comprising Sections 4.8 and 4.9, deals with functional flexibility; that is, with ongoing changes graduates experience within their workplace. In order to assess the importance of functional flexibility in graduate employment and work, the drivers of graduate functional flexibility in both the private and the public sectors are analysed. Further, the issue of competences related to functional flexibility is discussed, as is the possible contribution of higher education in equipping graduates to face changes in their workplace.

Finally, in Section 4.10 we shall draw some conclusions on the different existing ways of "being a flexible graduate", on the consequences of graduate flexibility and on the contribution higher education gives or might give to graduates in facing and adapting to a changing environment.

4.3 Changes in Graduates' Work and Employment Situation

In the years after they enter the labour market, graduates can experience various types of changes related to different dimensions of flexibility: changes in their terms of employment, shifts from one employer to another, shifts in and out of unemployment and changes in the occupation and/or economic sector in which they are employed. Figures 4.1, 4.2, 4.3, 4.4, 4.5 and 4.6 provide an overview of these changes, and help paint a picture of the extent to which graduates are required to be flexible and the extent to which they actually are flexible. To begin with, Fig. 4.1 shows the percentage of graduates who were self-employed in their first and in their current job.

Few graduates start out as self-employed, but this proportion increases somewhat between the first and the current job in all countries. Nonetheless, the proportion in self-employment still mostly constitutes a rather small group of graduates.

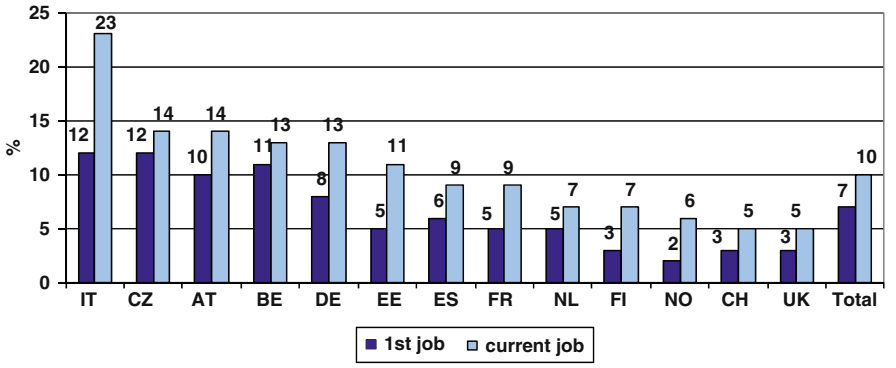

Fig. 4.1 Percentage of graduates who were self-employed in their first and current job

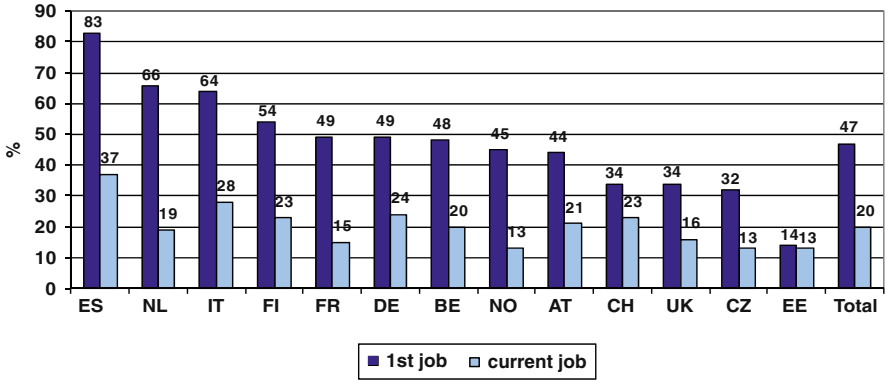

Fig. 4.2 Percentage of graduates with fixed-term/temporary contracts in their first and current job

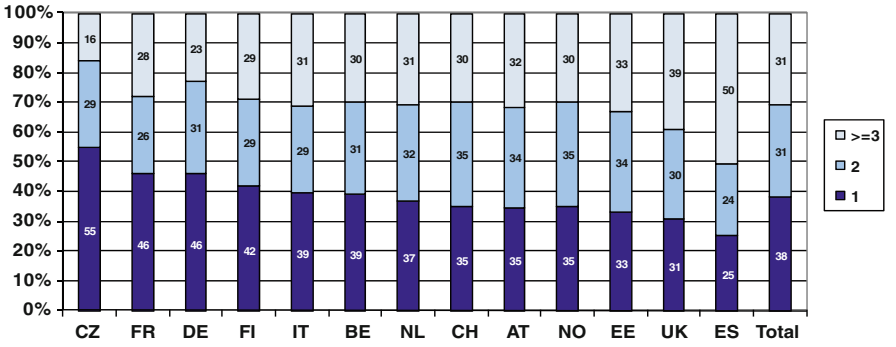

Fig. 4.3 Number of employers graduates have had since graduation

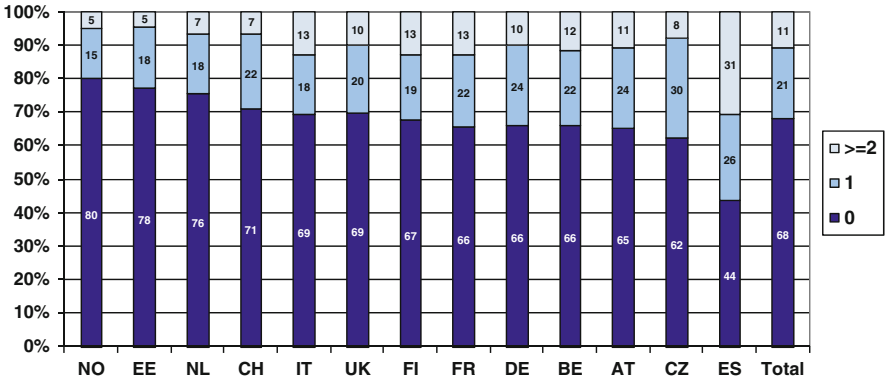

Fig. 4.4 Number of unemployment spells graduates have had since graduation

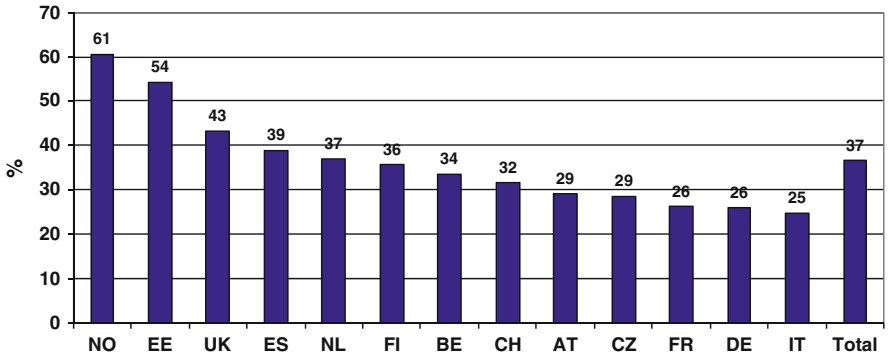

Fig. 4.5 Percentage of graduates who changed occupations between first and current job

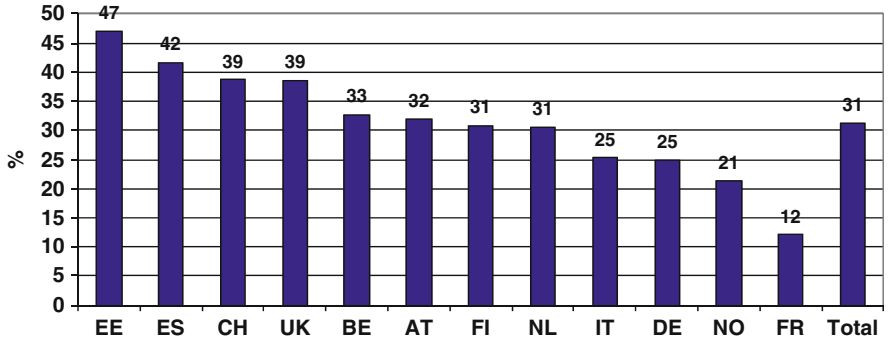

Fig. 4.6 Percentage of graduates who changed economic sectors between first and current job

Moreover, taking into account the occupational groups of self-employed graduates,[1] and the fact that 85% of self-employed graduates at the time of the survey depend on multiple clients rather than a single client, it seems more reasonable to consider these graduates as mostly self-employed professionals by choice rather than atypical workers. Consequently, it can be said that graduate self-employment gives a very limited contribution to flexibility. Italy has the highest percentage of self-employed graduates at the time of the survey, followed at a distance by Austria, the Czech Republic, Germany and Flanders. The position of Italy seems to be due to the overrepresentation of some well-established professions in that country, such as architects and engineers (19%) and legal professionals (25%).

Whereas almost half of the graduates across all countries started out in a temporary job, in the first five or six years after graduation this proportion decreases dramatically, to only one in five at the time of the survey (see Fig. 4.2). There were, of course, shifts in both directions, and a small proportion of graduates (some 5%) actually moved from a permanent contract in the first job to a temporary one five to six years later. However, a far greater proportion, almost a third of graduates across all countries, shifted from the flexibility of a temporary job towards stability in the form of a permanent contract. Almost half of all employed graduates had a permanent contract both in their first job and in their current work, while 15% of graduates had a temporary contract both in their first job and in their current work. It seems likely that the latter group comprise the graduates most exposed to external flexibility.

Temporary work in the first job is most prevalent in Spain, and the proportion is higher than average in the Netherlands, Italy, Finland, France, Germany and Flanders. As graduates' careers develop, countries grow more similar: in most cases, the strongest moves towards stability are in those countries that started out as more flexible. Nonetheless, temporary work remains relatively prevalent in Spain and Italy, and to a lesser extent in Germany, Finland, Switzerland and Austria.

More than 60% of all graduates changed employers at least once since graduation (see Fig. 4.3). Almost a third of European graduates report that they have had three or more employers since graduation. Graduate employment mobility is highest in Spain, and British and Estonian graduates are also quite mobile. By contrast, well over half of all Czech graduates have remained with the same employer since first obtaining work after graduation.

[1]Graduate self-employment consists of the following occupational groups: managers and entrepreneurs (10%), architects, engineers and related professionals (12%), computing professionals (3%), life science and health professionals, except nursing (12%), health associate professionals, except nursing (4%), teaching professionals (9%), business professionals (7%) with finance and sales associate professionals (3%), legal professionals (11%), social science and related professionals (6%), and writers and creative or performing artists (6%). These groups make up 83% of all graduate self-employment, and include members of the "liberal" or traditional professions, and of other regulated professions, semi-professionals, members of new professions, artists, and entrepreneurs.

Employment mobility can mean that graduates are exposed to unemployment, but this is not necessarily the case. Indeed, whereas a majority of European graduates have changed employers since graduation, unemployment spells are relatively rare (see Fig. 4.4). Spanish graduates form a clear exception here, with well over half having been unemployed at least once and almost a third two or more times. Multiple unemployment spells are also relatively common in Italy, France, Finland and Flanders. By contrast, four out of five Norwegian graduates have not been unemployed at all since graduation, and only one in twenty has been unemployed more than one. It should be noted that more than three quarters of European graduates who reported at least one unemployment spell since graduation also reported a search duration of a month or more before finding their first job after graduation. Such a search period at the start of the career cannot be seen as a result of external flexibility on the part of employers, but is rather a consequence of the more or less smooth functioning of the labour market for new graduates.

Shifting from employment to unemployment, or from one employer to another, aren't the only possible changes graduates experience during the first five or six years after graduation. Graduates can also change occupation (see Fig. 4.5) and/or economic sector (see Fig. 4.6). In order to assess occupational mobility, we look at changes between the first and current job in the occupational code assigned to graduates' occupations. There is substantial occupational mobility, especially when viewed against the background of the fact that some 38% of graduates did not change employers in that period (see Fig. 4.3). Thirty-seven percent of European graduates can be said to have changed occupations between the first and current job. Occupational mobility is highest in Norway, while more than half of Estonian graduate workers and some 43% of British graduates also changed occupations according to this measure. Such changes were relatively rare in Italy, Germany and France.

In assessing mobility between economic sectors we can rely on an analogous measure as used for occupation. This measure was constructed based on the rather small groups of the International Standard Industrial Classification (ISIC, Revision 3.1, Groups). According to this measure, sector mobility is also quite substantial: almost a third of European graduates changed economic sector between the first and current job. Sector mobility is highest in Estonia, where almost half of all graduates changed sectors, and it is also quite high in Spain, Switzerland and the United Kingdom. Most French graduates remained in the same sector.

All in all, in terms of flexibility the results so far are somewhat mixed. One the one hand, although almost half of European graduates started out in a temporary job, five to six years later most were employed in a job with a permanent contract. In addition, the level of self-employment is low, and composed more of self-employed professionals than flexible workers at the mercy of the market. On the other hand, the majority of European graduates report that they have had two or more employers in their early career, and in many cases this is associated with changes in occupation and/or economic sector. In an attempt to make sense of these apparently mixed results, we shall discuss these two matters more deeply. We start in the next section with a more detailed look at employment mobility.

4.4 Employment Mobility in Graduates' Early Career

As far as employment mobility in the early career is concerned, European graduates can be divided into three groups. As shown in Fig. 4.3, a first group reports having had just one employer since graduation. We refer to these as non-mobile graduates. A second group reports having had two employers, and a third three or more employers since graduation. We call these mobile and very mobile graduates respectively.

Looking first at the relation between employment mobility and characteristics of graduates, we see that there are only slight differences by gender (see Table 4.1). Female graduates are slightly more mobile than men. Students graduating in humanities and arts, and in health and welfare, are much more mobile than others, while students graduating in engineering, manufacturing and construction are less mobile than others (see Table 4.2).

Sometimes, shifting from one employer to another entails shifting from one occupation to another or from one economic sector to another.[2] As we would expect, the more mobile graduates are the more often they report a change in their occupation and/or economic sector (see Table 4.3). Similarly, we see that unemployment spells are more likely among more mobile graduates. Nonetheless, it is striking that almost half of even the very mobile group experienced no unemployment spells, suggesting that many graduates change jobs more than one time without ever being

Table 4.1 Employment mobility by gender (% of graduates)

	Males	Females
Non-mobile	41	37
Mobile	32	30
Very mobile	28	33

Table 4.2 Employment mobility by field of study (% of graduates)

	Education	Humanities and arts	Social sciences, business and law	Science, mathematics and computing	Engineering, manufacturing and construction	Agriculture and veterinary	Health and welfare	Services
Non mobile	42	32	36	40	45	37	35	41
Mobile	29	27	33	32	32	32	28	30
Very mobile	28	41	31	27	23	31	37	30

[2]Changing occupation without changing employer – for instance because of promotions – is also possible. To a lesser extent, changing economic sector without changing employer – because of mergers or spin-offs – may also occur.

Table 4.3 Changes in occupation and economic sector and unemployment spells by employment mobility (% of graduates)

	Non-mobile	Mobile	Very mobile	Total
Changed occupational code between first job and current work	20	44	51	37
Changed economic sector code between first job and current work	5	42	52	32
At least one unemployment spell since graduation	16	32	52	32

Note: The Czech Republic is not included in the data on economic sector changes.

unemployed. The 16% of graduates who have experienced unemployment without having been mobile were presumably unemployed for some time before finding their first (and to date only) position.

These results show that employment mobility is related to different faces of external flexibility. On one hand we see the hard face, in which graduates who change employers are exposed to unemployment. On the other hand we see the soft face, in which graduates change employers, perhaps for different reasons (to acquire new competences, to find a better job) without experiencing unemployment.

Employment mobility may have an impact on some other important aspects of graduates' situation in the years after graduation. In the next two sections, we look at two of these: the level of the competences graduates possess, and the kind of working position they've reached.

4.5 The Impact of Employment Mobility on Graduates' Competences

Employment mobility can have at least two different effects on graduates' competences. As already mentioned, changing employers can be a way – whether or not consciously pursued by graduates – to update and refresh existing competences and to acquire new competences and knowledge through learning-by-doing, on the job training and the like. However, moving from one employer to another might also turn out to be a way of depleting or wasting competences, because too little time is spent with each employer to develop meaningful knowledge and skills, or because the skills already gained are not useful in the changed situation. In this section, we would like to examine whether employment mobility does make a difference one way or another in terms of the level of competences possessed five to six years after graduation is concerned, in comparison with non-mobile graduates. To this end, a series of multiple linear regression models has been run, each having as dependent variable one of the 19 competences investigated in the REFLEX survey. As predictors in these models we include dummy variables indicating mobile and very mobile graduates, with non-mobile graduates as reference category. As control variables we

include gender, country of graduation, type of education,[3] field of study, the extent to which graduates' reference study programme has been a good basis for further learning on the job, having had continued after graduation for more than six months the work already held during study, having had a period of formal or informal initial training, months of employment since graduation,[4] and occupational group.

As the results of these regressions show (see Fig. 4.7), in most cases – that is, for 12 competences out of 19 – employment mobility doesn't have any significant impact on the level of competence possessed by graduates. This means that in these cases there is no effect of being non-mobile, mobile or very mobile on the level of competence possessed by graduates five or six years after graduation. There are

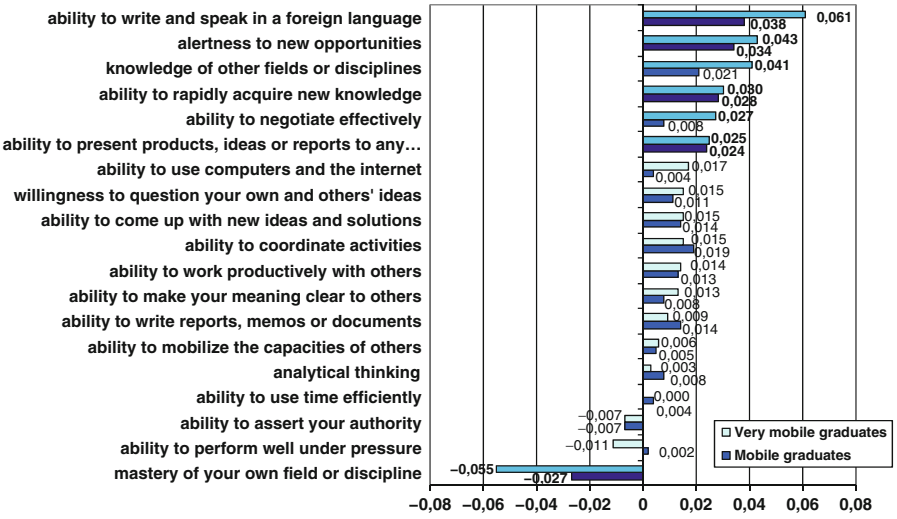

Fig. 4.7 The impact of employment mobility on graduates' competences (standardised regression coefficients). Effects significant at 1% level marked bold

[3]This is defined by the type of degree or of degrees graduates have gained, including additional education if relevant. More precisely, the first type of education results in holding only an ISCED 5A degree not giving access to PhD courses and other ISCED 6 study programmes. The second type of path results in holding only an ISCED 5A degree giving access to these advanced courses. The third type of path consists of a combination of a degree not giving access to advanced courses and additional education certified by a further qualification. The fourth type of path consists of a combination of a degree giving access to PhD or other advanced courses and additional education completed earning a relevant qualification.

[4]Apart from educational and work-related factors, it is especially important to control the relationship between employment mobility and level of competences by the duration of work experience after graduation because the time spent working after graduation influences both the number of employers a graduate can have and his or her ability to learn new things, and enhance his or her competences. As the variable on the duration of work experience (Number of months employed since graduation) had more than 1,500 missing values, we decided to assign to missing values of each country the average duration of work experience in the country expressed in months.

seven cases in which employment mobility does have an impact – albeit a small one – on competences.

Changing employers has a negative effect on the mastery graduates have of their own field of study or discipline. By contrast, employment mobility increases the knowledge of other fields or disciplines, the ability to rapidly acquire new knowledge, the alertness to new opportunities, the ability to present products, ideas or reports to an audience, and the ability to write and speak in a foreign language. It is interesting to note that in all cases – more for some competences than for others – the effects are stronger for very mobile than for mobile graduates. This reinforces the impression that it is really mobility that is the explanatory factor here, and not some unobserved characteristic on which mobile graduates happen to differ from mobile ones.

The results provide evidence that both of the postulated effects are at work here. Changing employers seems to provide graduates with an opportunity to enhance certain competences. Presumably, the exposure to different learning environments has allowed graduates to improve their learning skills, interdisciplinary knowledge and so on. However, moving from one employer seems to erode what is usually viewed as the main outcome of higher education studies, namely the mastery of a discipline. All in all, we can conclude that being a flexible graduate – that is, being mobile or very mobile – doesn't represent a disadvantage. In most cases, working for the same employer or having two or more employers during the first five or six years after graduation doesn't make a big difference as far as competences are concerned. It does appear that being mobile somewhat favours the development of certain generic competences, but at the cost of a slightly lower level of specific competences.

4.6 Employment Mobility as a Way to Get a Good Job

We now turn to the effect of employment mobility on the chance of having a good job five or six years after graduation. Again, there are two broad possibilities. On one hand, employment mobility might be a way to improve one's position in the years after graduation by moving to a job where one can better profit from one's own competences. On the other hand, employment mobility can be seen as a sign that graduates experience difficulties in finding their niche. As a simple indicator for this, we use job satisfaction. As shown in Table 4.4, mobile graduates report

Table 4.4 Graduates' job satisfaction by employment mobility (mean values and % of graduates)

	Non mobile	Mobile	Very mobile
Mean values	3,83	3,86	3,81
Percentage (very) satisfied (4 or 5 points)	69	69	68

Note: Satisfaction measured on a 5-point scale with 1 = "very dissatisfied" and 5 = "very satisfied".

almost the same level of job satisfaction as their non-mobile peers. Also here we can conclude that mobililty doesn't do graduates any harm. Despite their quite different labour market experiences, five or six years after graduation mobile graduates and non-mobile graduates are equally successful in getting what they feel is a good job.

Even if mobility doesn't affect job satisfaction per se, it may influence the way in which satisfaction is achieved. To examine this, we looked at whether there are specific competences which influence flexible graduates' job satisfaction to a greater or lesser extent than that of non-flexible graduates. Figure 4.8 provides information on the impact of different competences on job satisfaction among three groups of graduates: non-mobile, mobile and very mobile graduates. It summarises the results of a set of multiple linear regressions each having as dependent variable the degree of job satisfaction, and as independent variables the 19 competences investigated in the REFLEX survey. The effects of the level of the competences on job satisfaction are controlled for the same set of variables included in the previous analysis which may have an impact both on graduates' job satisfaction and on the level of competences possessed at the time of the survey.

Four main conclusions can be drawn from this graph. First, in most cases – other things being equal – the level of acquired competence doesn't have any significant impact on the degree of job satisfaction either among mobile or non-mobile graduates. Second, even the significant effects are quite small. Third, the number of competences having a significant effect is greater for non-mobile graduates than

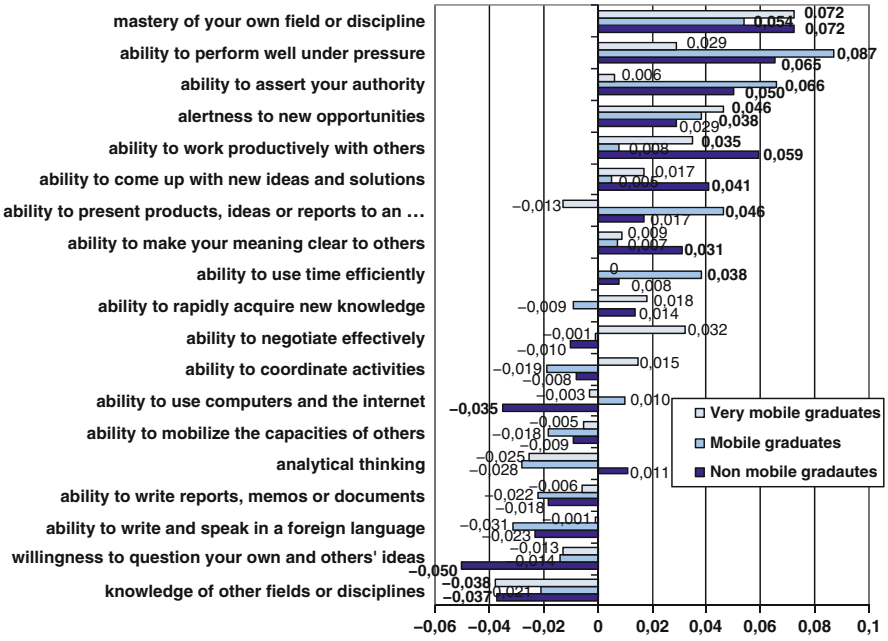

Fig. 4.8 Effects of competences on job satisfaction, by employment mobility (standardised regression coefficients). Effects significant at 1% level marked bold

for very mobile graduates, suggesting that as graduates become more mobile the importance of competences for job satisfaction decreases.[5] Fourth, in contrast to the effects of mobility on competences, there is no obvious additive effect of being very mobile above effects for being mobile. This casts doubt as to whether the differences between the groups are really attributable to mobility as opposed to some more or less coincidental other difference between the groups. Only in the case of alertness to new opportunities does the effect become consistently stronger as graduates become more mobile. On the face of it, this makes sense, since the alertness to new opportunities has been identified as one of the crucial characteristics of entrepreneurship (Swedberg, 2000).

In other respects it can be said that the three groups of graduates largely share a common basis for success in the years after graduation. The key factor shared by all groups is the mastery of one's own field or discipline, which can be considered the main component of professional expertise.

4.7 Graduates Facing Temporary Work

Although the proportion of graduates with a temporary contract diminishes consistently over the early career, five or six years after graduation, 20% of graduates still do not have a permanent contract. As fixed-term contracts are one of the means employers have to adjust the volume and the composition of the labour force to environmental changes, it can be said that some years after graduation one graduate out of five is exposed to this aspect of external flexibility.

In this section we investigate the main determinants of temporary work five or six years after graduation. We identified three broad groups of factors that may have an impact on the chance of temporary work. First, there are some personal characteristics of graduates such as gender, age, the social networks they are embedded in and the amount of working experience they have accumulated since graduation. Second, there are some characteristics of higher education: the type of degree, the field of study and some characteristics of their study programmes. Third, there are some structural features of national economies such as the division of labour at the level of economic sectors and occupational groups, and some specific features of the organisations graduates are working for: private versus public sector, the scope of operations and size.

In order to assess the impact of these factors on employment relations, a multivariate model was specified, with as dependent variable a dummy indicating a fixed-term contract at the time of the survey as opposed to an unlimited-term contract. In addition to the abovementioned explanatory variables, we included a set

[5] Among the control variables there are two factors which stand out as determinants of job satisfaction in all three groups. The first is the degree to which the study programme is perceived as laying a good basis for further learning on the job, which significantly increases the level of job satisfaction especially among mobile and very mobile graduates. The second is occupational level: as they move up the occupational ladder, graduates – especially very mobile ones – are more satisfied.

of dummy variables for country of graduation as a proxy of the general features of the national higher education and economic systems, with France as the reference country.[6]

Table 4.5 shows the results of two binomial logistic regressions. In order to assess the impact of having a fixed-term contract in the first job on the probability of having the same type of contract at the time of the survey, in the first model we do not control for the type of contract in first job, while in the second model we do.

Other things being equal, having a fixed-term contract in the first job increases the probability of having temporary work five or six years after graduation. Nonetheless, most of the factors that have a significant effect on the probability of a fixed-term contract before controlling for this still show a significant effect after this has been controlled for.

Work experience after graduation decreases the probability – even after controlling for initial contract – of having a fixed-term contract five or six years after graduation. By contrast, belonging to the generation of younger graduates makes a temporary contract more likely.

At first sight, the results pertaining to the type of qualification of graduates seems counterintuitive, suggesting that increasing one's level of qualification makes it more likely that one will have temporary work. Graduates with second-level degrees and/or with additional qualifications obtained since graduation in 2005/2006 are more likely to be employed in a temporary contract than graduates with first-level degrees and/or no additional qualifications. However, it seems likely that at least the effect of additional qualifications should be interpreted in the light of graduates still being in training for part of the period since graduation. Since traineeships are often combined with work, this will not necessarily show up in a lower number of months of working experience. Some graduates may still be engaged in such traineeships, which are usually by definition temporary positions.

Those working in the public sector have a greater probability of having a fixed-term contract. This finding is also consistent with the effects of economic sector: working in the manufacturing sector decreases the probability of a temporary contract, while working in education and the health sector increases this probability.

It is interesting to note that the effect on temporary work of some fields of study is no longer significant when the type of contract in the first job is included in the analysis. Before this control, graduates from computer science were less likely to have a temporary contract, and graduates in other "hard" sciences and health or social work were more likely, but these effects were no longer significant once the control was included. These effects therefore seem to be mainly through an increased chance of temporary work on labour market entry. Holding a degree in education decreases the probability of having a fixed-term contract even after controlling for the type of contract in the first job. This is striking, since we saw that working in the education sector increases this probability. This apparent inconsistency reflects the fact that not all graduates with a degree in education work in the education sector,

[6]Not included in Table 4.5.

Table 4.5 Determinants of temporary work five to six years after graduation (unstandardised logistic regression coefficients)

	No control for first job	Control for first job
Fixed-term/temporary contract in first job		1,514
Gender: female	–0,108	–0,151
Age: 36 years old or less	0,742	0,448
Very useful social networks	0,238	0,267
Months employed since graduation	–0,034	–0,032
Qualification (ref. Second-level degree, no additional qualification)		
First-level degree, no additional qualification	–0,385	–0,285
First-level degree plus additional qualification	–0,034	–0,010
Second-level degree plus additional qualification	0,293	0,251
Field of study (ref: Social Sciences)		
Education	–0,469	–0,474
Humanities	–0,130	–0,166
Law	–0,127	–0,265
Business administration	–0,178	–0,091
Computer science	–0,516	–0,357
Other hard sciences	0,325	0,263
Engineering & architecture	–0,207	–0,167
Agriculture & veterinary	0,196	–0,006
Health & social work	0,338	0,228
Services	–0,254	–0,248
Vocationally oriented study programme	–0,198	–0,152
Academically prestigious study programme	0,113	0,097
Economic sector (ref: Public Administration)		
Manufacturing and other productive activities	–0,464	–0,429
Trade, transport and other traditional services	0,153	0,177
Business and financial services, and communication	–0,145	–0,084
Education	0,966	0,846
Health and social work	0,606	0,559
Occupation (ref: Managers, legislators, and senior officials)		
Professionals	0,765	0,657
Technicians and associate professionals	0,585	0,422
Clerks, workers and others	0,699	0,522
Public sector	1,226	1,179
Scope of operations (ref: national)		
Local	–0,612	–0,607
Regional	–0,255	–0,272
International	0,230	0,241
Organisation size (ref: medium)		
Small	0,295	0,309
Big	–0,056	–0,013

and particularly the fact that most graduates working in the education sector in fact do not have a degree in education. The latter case refers mainly to secondary school teachers and university lecturers, most of whom did not receive their main degree in education. Especially university lecturers often have temporary contracts.

All in all, this analysis provides a rather coherent picture of graduate temporary work in the years after graduation. Temporary jobs are strongly a feature among graduates with little work experience – that is, people at the beginning of their career – and of younger graduates. Consequently, external flexibility can be understood as a temporary experience shaping the early career of graduates. Combined with the high proportion of graduates with a fixed-term contract in the first job, the results suggest that having a fixed-term contract in the very early career – what some have called an "external career" – can be understood as a device used by graduates to explore the labour market, to collect information on both jobs and employers. Correspondingly, they can be seen as a screening device used by employers to select or to test graduates, their knowledge and skills and their reliability as they enter the labour market.

Later on – five or six years after graduation – temporary work appears to be mainly a feature of the public sector, especially the education and health sectors.[7] Further, graduates more likely to be exposed to temporary work are those who have studied longer and/or gained more advanced degrees. These findings indicate that graduate temporary work depends to a large extent on regulations in the public sector and/or of specific professions employing graduates with advanced degrees, and that graduates working in temporary contracts several years after graduation do so because they are in the early stages of their career after completing a long course of studies, and/or are entering professions requiring a long preparation, which possibly resort to temporary contracts to regulate access.

4.8 Functional Flexibility in Graduate Employment and Work

We now shift our attention from the labour market on which graduates operate to their workplace. In the workplace, changing the contents of work tasks is a crucial aspect of functional (or internal) flexibility. As employers seek for a more flexible use of human resources, employees can be assigned to different activities within the organisation, and their existing work tasks can be modified. Something similar may also happen to the self-employed, although in this case the changes are likely to be driven mainly by market forces and/or public regulations.

At the time of the survey, 40% of European graduates indicated that they had experienced a major change in their work tasks since they started their current job or

[7]The high presence of women in the public sector, in education, health, and social work possibly explains why the gender variable doesn't have any significant effect on the probability of having a temporary contract five or six years after graduation.

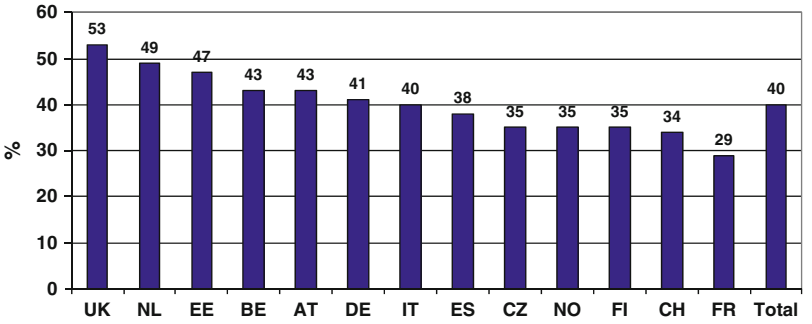

Fig. 4.9 Functional flexibility by country (% of flexible graduates)

self-employment. Graduates working in the private sector are more exposed to functional flexibility (46%) than their colleagues working in the public sector (36%). Further, graduate functional flexibility varies across countries (see Fig. 4.9). The highest levels of flexibility can be seen in the United Kingdom, the Netherlands and Estonia, where around half of all graduates are exposed to changes in their work tasks. The lowest levels are seen in the Czech Republic, Norway, Finland, Switzerland and France, where only around a third of graduates are exposed to changes in their work tasks.

In order to assess the importance of functional flexibility in graduate employment and work, we shall first investigate the drivers of functional flexibility. Next, we'll turn to the issue of competences related to functional flexibility, and of the contribution higher education gives to help graduates deal with it. As changing the contents of work tasks is a crucial aspect of functional flexibility, we shall use it as an indicator of graduates' involvement in this second dimension of flexibility.

Functional flexibility – that is, major changes in graduates' work tasks – can have two main causes. On one hand, changes in graduates' work tasks may result from the introduction of innovations in their workplaces. In Chapter 5, the three types of innovations which can affect both organisations and graduates' work – innovations in terms of product or service, of new technologies, tools or instruments, and of knowledge or methods – are discussed. On the other hand, there may be changes in the structure, corporate status and so on that may have an impact on graduates' work tasks. These changes may be related to reorganisations, mergers or takeovers by another firm, large-scale layoffs of personnel or a relocation to another region.

Although functional flexibility can apply to both the private and the public sector, its determinants may be different in the two sectors. In the private sector, innovations and organisational changes depend on the strength of competition graduates' firms are facing, and on the stability of demand in the relevant market. In the public sector, innovations and organisational changes are likely to be mainly policy driven and to depend less on the strength of competition.

In order to test our expectations concerning the drivers of functional flexibility, two multivariate models have been estimated, one for the private sector and one for

the public sector. Both models have as dependent variable a dichotomous variable contrasting graduates who have experienced a major change in their work tasks since they started working in the organisation where they were employed at the time of the survey to graduates who haven't experienced such a change. Both models have as predictors the combination of innovation and organisational change graduates have experienced in their workplace. In both models we include a set of control variables, which are the same in both models with two relevant exceptions. Graduates' tenure, economic sector, the size of the organisation in which they are working, its scope of operations and the country of employment of graduates are common to both models. In addition, in the model for the private sector, we also include the strength of competition graduates' organisations are facing, and the degree of stability of the demand in the market in which they operate.

Graduates' tenure, defined as the time spent by graduates working in their current organisation, is an important control variable, since the longer graduates have worked in their organisation, the greater the chance is that their work tasks will have changed, other things being equal. Other factors may affect innovation and organisational change differently in the private and in the public sectors. For example, in the private sector some economic sectors are more exposed to competition and globalisation, and may be expected to respond to these influences through innovative management and work practices. Some sectors, both public and private, are characterised by higher levels of research and development activities than others. In firms with an international or national scope of operations we would expect stronger competition, a greater intensity of innovation, and thus a higher degree of functional flexibility. The impact of firm size on innovation and organisational change is subject to more dispute (see also next chapter). Common sense argues that large organisations are more exposed to change, innovation and functional flexibility than small ones. However, in the private sectors, start-ups based on information and communication technologies could be very innovative. Further, small and medium size enterprises could be more exposed to competition, so functional flexibility could be higher. In the public sector, it might be that big organisations are more bureaucratic and less keen on innovation. Finally, country-specific institutional settings and economic conditions can play a role both in the private and in the public sectors.

Table 4.6 shows the results of the two binomial logistic regressions which have been run, one for each sector.

The results confirm that innovation and organisational changes can indeed be considered drivers of functional flexibility both in the private and in the public sectors. Compared to the situation in which there is neither innovation[8] nor organisational changes, graduates exposed to one or both of these influences are clearly more likely to have experienced major changes in their work tasks. It seems that being exposed to organisational changes has a somewhat stronger effect than being

[8]Defined in terms of graduates being exposed to at least one type of innovation (in product or service, in technologies, tools or instruments, or in knowledge or methods).

Table 4.6 The drivers of functional flexibility (unstandardised logistic regression coefficients)

	Private sector	Public sector
Innovation and organisational changes (ref: no innovation or changes)		
Both innovation & changes	1,007	1,178
Just innovation, no changes	0,413	0,478
No innovation, just changes	0,736	0,849
Current job tenure (months)	0,013	0,008
Economic sector:		
Manufacturing and other productive activities	–0,163	0,434
Trade, transport and other traditional services (ref: category for private sector)	n.a.	0,398
Business and financial services, and communication	–0,112	0,177
Public administration	–0,023	0,385
Education	–0,223	–0,168
Health and social work (ref: category for public sector)	–0,212	n.a.
Organisation size (ref: medium)		
Small	0,088	–0,064
Big	–0,015	–0,164
Scope of operations (ref: national):		
Local	–0,317	–0,119
Regional	0,030	–0,182
International	0,095	–0,143
Country of employment:		
Italy (ref: category for public sector)	n.a.	–0,050
Spain	–0,065	0,327
France	–0,233	–0,359
Austria	–0,020	0,197
Germany	–0,089	0,472
The Netherlands	0,277	0,716
United Kingdom	0,299	1,089
Finland	–0,236	–0,027
Norway (ref: category for private sector)	–0,315	n.a.
Czech Republic	–0,231	–0,187
Switzerland	–0,120	–0,145
Belgium (Flanders)	0,423	0,432
Estonia	0,120	0,490
Other countries	0,000	0,386
Highly unstable demand	0,002	n.a.
Strong competition	0,176	n.a.

exposed to innovations, but that being exposed to both kinds of influence has a stronger effect than being exposed to just one without the other.

Two effects of control variables are also worth mentioning. Not surprisingly, job tenure increases the probability of being confronted with major task changes in the workplace. Secondly, in the private sector, as competition gets stronger the probability of major changes in work tasks increases. This means that competition is playing

a role in promoting graduates' functional flexibility, independently of innovations and organisational changes.

Summing up the results above, we can draw the following conclusions:

- Five or six years after graduation, 40% of European graduates (43% in the private sector, 36% in the public sector) have already experienced major changes in their work tasks.
- The probability that European graduates working both in the private and in the public sectors need to cope with functional flexibility increases when they have been exposed to innovations and/or organisational changes.
- Graduates working in the private sector are more likely to be exposed to functional flexibility when competition is stronger.
- Since there is no reason to expect that innovations, organisational change and competition in European knowledge societies will become less prevalent in the near future, we can conclude that functional flexibility will remain part of the work experience of a large – and possibly growing – proportion of European graduates. We therefore consider functional flexibility to be one of the most important – if not the most important – dimensions of flexibility in graduate employment and work.

4.9 Functional Flexibility, Competences and Higher Education

Given the importance of functional flexibility, it is useful to know what kind of competences are required of flexible graduates.

According to the self-perception of respondents, the level of competence required of flexible graduates – that is, those who have experienced major changes in their work tasks – is in all cases but one slightly higher than the level required of non-flexible graduates (see Fig. 4.10). Among the 19 competences included in the REFLEX Project, the competences for which the level required of flexible graduates most strongly exceeds that of non-flexible graduates are: the ability to negotiate effectively, the ability to mobilise the capacities of others, alertness to new opportunities, the ability to coordinate activities, the ability to assert your authority, the ability to perform well under pressure, the ability to come up with new ideas and solutions, the ability to work productively with others and the ability to use computers and the internet.

The one competence that is required equally of both flexible and non-flexible graduates is – not altogether surprisingly – the mastery of one's own field or discipline.

Do flexible graduates consider themselves capable of meeting the demands and expectations of their employers in terms of these nine competences? Figure 4.11 shows the percentage of graduates with a shortage or a surplus of these competences.[9] In all cases, a strong majority of flexible graduates have at least a high

[9] See Chapter 2 for the definition of shortages and surpluses.

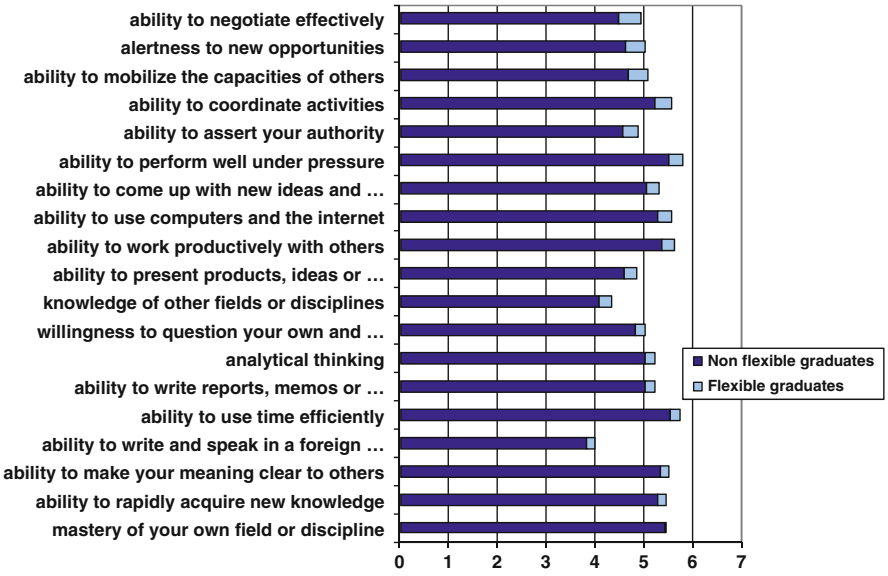

Fig. 4.10 Mean required level of competences, by functional flexibility

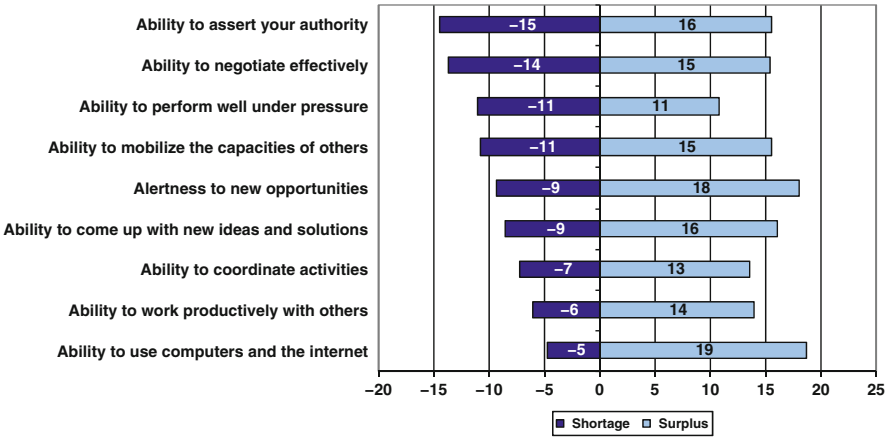

Fig. 4.11 Differences between possessed and required competences (% of flexible graduates; only competences especially required of flexible graduates)

enough level to meet employers' requirements, that is, their own competences are in balance with or are even in surplus compared to the level required in their job. Nonetheless, in some cases, a sizable proportion of flexible graduates – between 1 in 20 and 3 in 20 – experiences a shortage in their own abilities, in other words the level of competence required by employers seriously exceeds their own level of competence. This applies mainly to competences pertaining to the realm of power relations, namely the ability to negotiate effectively, the ability to assert one's

authority, the ability to mobilise others' capacities and the ability to perform well under pressure.

All in all, we can conclude that most functionally flexible graduates are well enough prepared to meet employers' demands, but that a consistent proportion of them report a deficit on one or more of the competences most specific to flexible graduates.

There are two sets of indicators which offer insights into the graduates' perception of the contribution higher education has made to preparing them for work in a changing environment. First, graduates were asked to name a maximum of three from the list of 19 competences that they regard as strong points, and a maximum of three that they regard as weak points, of their study programme. Second, graduates were asked to indicate the extent to which higher education provided a good basis for various aspects of work, career and life in general. Figure 4.12 shows the answers graduates across all countries gave on the first set of indicators.

There are a number of competences which are seen by graduates much more as strong points than as weak points of their study programme: mastery of one's own field or discipline, analytical thinking, the ability to rapidly acquire new knowledge, the ability to write reports, memos or documents, the ability to work productively with others and the ability to perform well under pressure. Only the latter two are competences that were seen above to be especially relevant to flexible graduates. It is striking that the ability to perform well under pressure, which was seen to be in deficit among a high percentage of graduates, is nonetheless more often viewed as a strong point than as weak point of the study programme. This suggests that most graduates who experience a deficit of this competence in their work don't feel that their study programme let them down in this respect. It seems likely that graduates

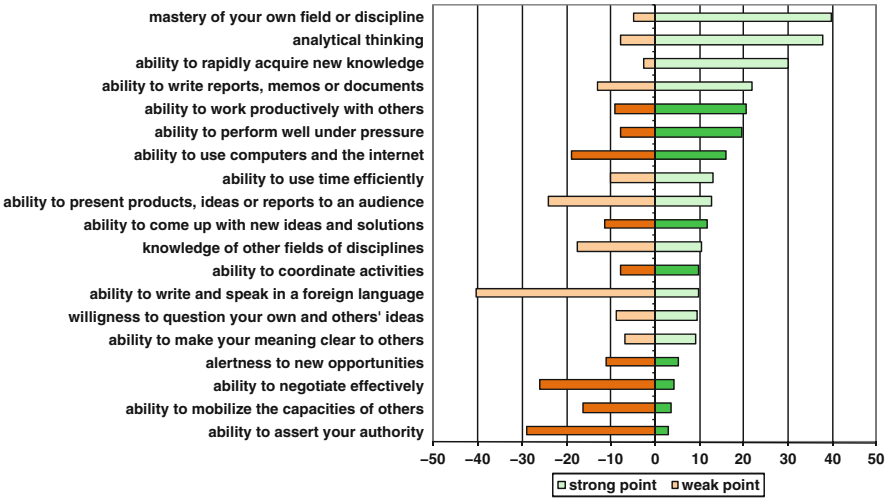

Fig. 4.12 Strong (*right*) and weak (*left*) points of graduates' study programmes (% of graduates). Competences especially required of functionally flexible graduates in darker colours

see this more as a competence that one can best acquire in a work setting rather than in the classroom.

There are other competences which are more or less equally often considered strong points as weak points: the ability to use computers and the internet, the ability to use time efficiently, the ability to come up with new ideas and solutions, the willingness to question your own and others' ideas, and the ability to coordinate activities and to make graduates' meaning clear to others. Three of these – the ability to use computers and the internet, the ability to come up with new ideas and solutions and the ability to coordinate activities – are competences especially important for flexible graduates.

The remaining seven competences are much more often considered weak points than as strong points: the ability to write and speak in a foreign language, the ability to present products, ideas or reports to an audience, the ability to assert authority, the ability to negotiate effectively, the ability to mobilise the capacities of others, knowledge of other fields or disciplines, and the alertness to new opportunities. Four of these competences are among the ones most relevant for functionally flexible graduates: the ability to assert your authority, the ability to negotiate effectively, the ability to mobilise the capacities of others and the alertness to new opportunities. As we already saw in Fig. 4.11, these competences also showed a high percentage of graduates reporting a deficit. On balance, graduates are quite negative in their evaluation of the study programme in terms of competences that are especially relevant for flexible graduates, with only two of these competences showing a clear positive balance, while four are seen much more as weak than as strong points. The fact that graduates mention these as weak points suggests that they feel that their study programme could have provided a better preparation in this respect, and thus that, in their perception at least, these competences can be learned in education.

As mentioned above, in addition to the evaluation of strong and weak points, graduates were asked to what extent their study programme formed a good basis for various aspects of work, career and life in general. Especially relevant in the discussion of flexibility is the graduates' evaluation of the programme as a basis for performing their current work tasks. It is interesting to look at what aspects of the study programme contribute most to a positive evaluation in this respect, and in particular whether this differs between flexible and non-flexible graduates. Table 4.7 shows the results of two linear multiple regressions with dependent variable the extent to which the study programme formed a good basis for performing current work tasks,[10] and characteristics of the study programme and modes of teaching and learning as predictors. The models have been estimated separately for flexible and non-flexible graduates.

There are few strong differences between flexible and non-flexible graduates as far as the effects of general programme characteristics are concerned. All six characteristics show a positive impact on the evaluation of the programme in terms of preparing graduates for their current work tasks, and the strength of the effects is

[10]Measured on a five point scale ranging from 1 = "not at all" to 5 = "to a very high extent".

Table 4.7 The impact of various aspects of study programmes on the extent to which graduates feel that they have offered a good basis for performing current work tasks (standardised regression coefficients)*

	Flexible graduates	Non-flexible graduates
Programme characteristics:		
Programme was generally regarded as demanding	**0,063**	**0,068**
Employers are familiar with the content of programme	**0,101**	**0,125**
There was freedom in composing your own programme	**0,029**	**0,039**
Programme had a broad focus	**0,055**	**0,037**
Programme was vocationally orientated	**0,190**	**0,196**
Programme was academically prestigious	**0,108**	**0,080**
Modes of teaching and learning		
Lectures	**0,048**	**0,036**
Group assignments	–0,008	0,000
Participation in research projects	0,011	0,009
Internships, work placement	**0,051**	**0,089**
Facts and practical knowledge	**0,115**	**0,103**
Theories and paradigms	**0,034**	–0,003
Teacher as the main source of information	0,015	0,016
Project and/or problem-based learning	**0,087**	**0,067**
Written assignments	0,015	**0,031**
Oral presentations by students	**0,033**	**0,058**
Multiple choice exams	0,005	**–0,031**
Participated in work placement/internships	0,019	**0,047**

*Significant effects (5% level) in bold.

similar for flexible and non-flexible graduates. There are some small differences. Academically prestigious programmes and programmes with a broad focus have a slightly stronger positive effect among flexible graduates than among non-flexible graduates. The difference in effect of broad focus is in line with what we would expect, since graduates of broader programmes would be more likely to have been exposed to a greater range of topics during higher education, which will stand them in good stead when their work tasks are changing. On the other hand, a greater familiarity by employers with the content of the study programme has a stronger effect for non-flexible graduates.

When we look at the effect of emphasis placed on different modes of teaching and learning, we see more differences. The emphasis on theories and paradigms appears to positively influence the evaluation of the study programme as preparation for current work tasks only among flexible graduates. By contrast, the emphasis on written assignments improves the evaluation only among non-flexible graduates. In addition, emphasis on oral presentations and internships or work placements show slightly stronger effects for non-flexible than for flexible graduates. The latter difference is reinforced by the finding that actual participation in work placements only has a significant impact for non-flexible graduates. Combined with the difference

noted above for the effect of familiarity of employers with the programme content, these results suggest that especially graduates with a rather stable job content benefit from links between higher education and work. By contrast, it is especially graduates faced with a changing job content who benefit from more theoretically oriented (and possibly more prestigious) programmes, which impart more abstract knowledge that can be useful in a broad range of contexts. Curiously, an emphasis on multiple choice exams is related to a poorer evaluation of the programme by non-flexible graduates, but not by flexible graduates.

4.10 Conclusions: Two Different Ways of Being Flexible

Many European graduates are faced with major changes in the labour market and their workplace in the first five or six years after graduation. In that period, 62% of European graduates changed employer at least once (half of whom changed more than once) and 40% experienced a major change in their work tasks since they started in their current place of work. The first change is related to what we call external flexibility, while the second is related to what we call functional flexibility.

There are two different faces of external flexibility. On one hand, around a quarter of all graduates are confronted with the hard face, being exposed to unemployment when they change from one employer to another. On the other hand, a little over a third of all graduates are exposed to the soft face, managing to change employers without experiencing unemployment.

Employment mobility in the early career isn't necessarily a disadvantage for European graduates. There are no major differences in competences between mobile and non mobile graduates. Only in the case of mastery of one's own field or discipline are mobile graduates slightly penalised. In other cases, mobile graduates are even slightly favoured. Moreover, five or six years after graduation, non-mobile, mobile and very mobile graduates are equally successful in terms of job satisfaction. While satisfaction for both mobile and non-mobile graduates is strongly based on mastery of their own field or discipline, satisfaction for mobile graduates is much more strongly related to a typical entrepreneurial skill, namely the alertness to new opportunities than is satisfaction for non-mobile graduates.

For most graduates, temporary- or fixed-term contracts are themselves largely a temporary phenomenon, with almost half of all European graduates having such a contract in the first job, compared to only one in five at the time of the survey some five to six years after graduation. Nonetheless, having a fixed term contract in the first job strongly increases the chance that one has a fixed term contract at the time of the survey. Work experience after graduation decreases this probability, while enrolment in further education after graduation in 1999/2000 increases it. Working in the public sector, particularly in areas such as education and the health also makes it more likely graduates will still have a temporary contract at the time of the survey.

When we turn to functional flexibility, we see that around two in five European graduates have experienced major changes in their work tasks since they started

work in their current job. This kind of flexibility is more common in the private than the public sector. Both in the private and public sectors, functional flexibility is strongly related to the introduction of innovations, to organisational changes, and – in the private sector – to the strength of competition.

The data show that a significant proportion of flexible graduates report shortages on the competences that were found to be especially important for them in comparison to non-flexible graduates. Several of these competences were regarded by many graduates as weak points of their higher education programme.

Based on an analysis of graduates’ evaluation of the study programme as preparation for their current work tasks, flexible graduates seemed to especially appreciate programmes that were broad and theoretical, presumably since the knowledge imparted by such programmes is less rigidly fixed to any given job description. By contrast, non-flexible graduates, that is, graduates with a rather stable job content, seem to especially value programmes with strong links between higher education and work.

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Chapter 5
Graduates in the Knowledge and Innovation Society

Jean-Jacques Paul

5.1 Introduction

The term *knowledge society* has been coined to indicate not only the expansion of participation in higher education or of knowledge-intensive or high-technology sectors of the economy, but rather a situation in which the characteristics of work organisations across the board change under influence of the increasing importance of knowledge (Allen & van der Velden, 2005). Some scholars, such as Drucker (1959), claim that a new kind of worker has appeared, one who represents the essence of the knowledge society. It is these knowledge workers who give the knowledge society its character, its leadership, its central challenges and its social profile. According to Drucker, these workers differ fundamentally from others in several respects. Knowledge workers gain access to work, job and social position through education. By definition, knowledge workers are specialised and work in teams. Against that background, the performance of individuals in acquiring and applying knowledge is increasingly seen as the key competitive factor for career and earnings opportunities.

Whereas Drucker (1959) does not give a precise definition of what he calls the knowledge worker, Reich (1991) tried to be more explicit with his "symbolic analysts". Symbolic analysts are workers who exchange data, words, oral and visual representations. They belong to occupations such as engineers, attorneys, scientists, professors, executives, journalists, consultants and other "mind occupations" engaged in processing information and symbols. They concern all the activities linked to problem solving, problem identifying and strategic brokering.

Other scholars, such as Wolf (2003) in the UK or Duru-Bellat (2006) in France, have cast doubt concerning the extent of the knowledge and innovation society and the changes it imposes on the labour market for graduates. Consequently, it is important to identify to what extent graduates are involved in knowledge and innovation activities, and to what extent such activities determine their work environment.

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In this chapter we examine the demand for innovation and knowledge management among higher education graduates. In particular we look at the role played by higher education graduates in the knowledge and innovation society, and how this varies with characteristics of work organisations and their environment. Five main questions will be addressed:

(1) What does innovation mean?
(2) What kinds of organisations are likely to be more innovative?
(3) What role do HE graduates play in introducing innovations?
(4) How well are they equipped to play such a role?
(5) What occupations are most related to innovation and are innovative activities rewarded?

5.2 Some Conceptual Elements About Innovation

According to Foray (2000), the knowledge economy is at the confluence of two major trends: the growing importance of human capital and the development of information and communication technologies. As Castells (2000) has argued, a global economy is something different than a world economy as described by Fernand Braudel and Immanuel Wallerstein. It is an economy with the capacity to work as a unit in real time on a planetary scale. Only in the late twentieth century was the world economy able to become truly global on the basis of the new infrastructure provided by information and communication technologies (Fig. 5.1).

Since globalisation allows faster flows of ideas, production factors, financial capital, human resources and products, competition has become fiercer and more strategic. A way to meet such increased competition is to develop new products, which allows firms and organisations to take advantage of temporary monopolies, to promote new processes in order to lower production costs, or to create new markets to allow an increase in the level of production, and to promote economies of scale.

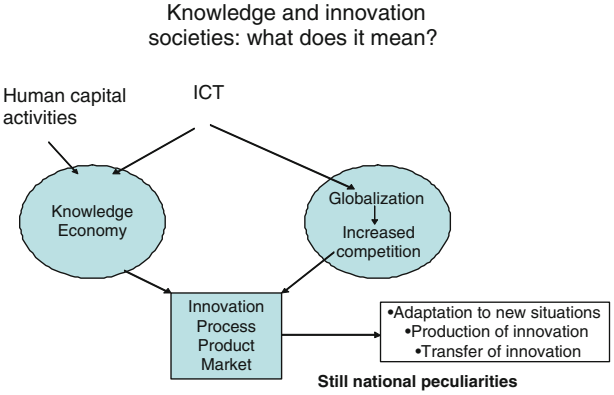

Fig. 5.1 Conceptualisation of knowledge and innovation societies

The innovation required to meet the strongest competition can be developed if organisations are prepared. To do so, organisations must really change their ways of thinking and working, at both the macro and micro levels, to adapt the rules of knowledge societies. Innovation appears to be a necessary response to increased competition, and is made possible thanks to the tools implemented in the knowledge society. As already stated, increased innovation leads to new demands for higher education graduates to be able to adapt themselves in an innovative environment, and to produce and disseminate innovations.

At the beginning of the twenty-first century, countries are developing different strategies for promoting knowledge societies, as can be seen in the differing concepts of national or social systems of innovation. For that reason, it is probably more correct to propose a concept of knowledge and innovation societies (KISS) instead of a single knowledge and innovation society.

It is not easy to capture the activities linked to KISS. Different manuals have tried to propose methodologies for measuring research and development (R&D) and innovation activities. The first of them, the Frascati manual (2002), deals with the measurement of human and financial resources devoted to R&D. The second one, the Canberra manual (1995), aims at measuring Human Resources in Science and Technology. And the third one, the Oslo manual (2002), offers guidelines for collecting and interpreting technological innovation data.

R&D is defined by the Frascati manual as covering three activities: basic research, applied research and experimental development. Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of the phenomena and observable facts, without any particular application or use in view. Applied research is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific aim or objective. Experimental development is systematic work, drawing on existing knowledge gained from research and/or practical experience, that is directed to producing new materials, products or devices, to installing new processes, systems or services, or to improving substantially those already produced or installed. According to the manual, the basic criterion for distinguishing R&D from related activities is the presence in R&D of an appreciable element of novelty and the resolution of scientific and/or technological uncertainty, that is, when the solution to a problem is not readily apparent to someone familiar with the basic stock of commonly used knowledge and techniques in the area concerned.

The first definition of innovation was proposed by Schumpeter (1934), who distinguished five types of innovative activities:

- Introduction of a new product or a qualitative change in an existing product;
- Process innovation new to an industry;
- The opening of a new market;
- Development of new sources of supply for raw materials or other inputs;
- Changes in industrial organisation.

If we refer to the Oslo manual, technological product and process (TPP) innovations are defined as comprising implemented technologically new products and processes

and significant technological improvements in products and processes. A TPP innovation has been implemented if it has been introduced on the market (product innovation) or used within a production process (process innovation). TPP innovations involve a series of scientific, technological, organisational, financial and commercial activities. The TPP innovating organisation is one that has implemented technologically new or significantly technologically improved products or processes during the period under review.

In the manual, the term "product" is used to cover both goods and services. A technologically new product is a product whose technological characteristics or intended uses differ significantly from those of previously produced products. Such innovations can involve radically new technologies, can be based on combining existing technologies in new uses or can be derived from the use of new knowledge.

A technology-improved product is an existing product whose performance has been significantly enhanced or upgraded. A simple product may be improved (in terms of better performance or lower cost) through use of higher performance components or materials, or a complex product which consists of a number of integrated technical sub-systems may be improved by partial changes to one of the sub-systems.

For the manual, technological process innovation is defined as the adoption of technologically new or significantly improved production methods, including methods of product delivery. These methods may involve changes in equipment, or production organisation, or a combination of these changes, and may be derived from the use of new knowledge. The methods may be intended to produce or to deliver technologically new or improved products, which cannot be produced or delivered using conventional production methods, or essentially to increase the production or delivery efficiency of existing products.

In the REFLEX survey, it was not possible to include refined measures for innovation, because of the limitations imposed by a questionnaire that had to be completed by graduates. Three questions were included that specifically referred to innovation. The first one deals with the extent of innovation in the organisation where graduates are employed: *How would you characterize the extent of innovation in your organization or your work, with respect to the following aspects?* Graduates had to indicate on a scale ranging from 1 (very low) to 5 (very high) the intensity of the three types of innovation (product/service, technology/tools/instruments, knowledge/methods). The second question deals with the role played by the graduates: *Do you play a role in introducing these innovations in your organisation?* Respondents had to answer *"yes"* or *"no"* or *"not applicable/no innovation"* for each one of the three types of innovation. The third question asks, *Is your organisation or – in case of self-employment – are you normally at the forefront when it comes to adopting innovations, new knowledge or new methods, or is it more a follower?* Graduates had to indicate their answers on a scale ranging from 1 (more at the forefront) to 5 (more a follower).

In the absence of a precise definition of innovation, graduates had to interpret the concept on their own. That means that the results cannot be considered as precise as

the ones from specialised surveys, such as the Community Innovation Survey, which study in detail the place of innovation within European organisations. However, they can provide a broad picture of the importance of innovation in the working life of recent graduates.

5.3 What Organisations Are Likely to Be More Innovative?

As mentioned above, graduates were asked to rate the extent of innovation in the organisation they were working in. Such an indicator can be used to study the characteristics of innovative organisations. As we have seen, innovation is often seen as a rational response by organisations to increased competition. Similarly, the degree of innovation is probably linked to the scope of the market in which organisations operate. In the next section, we look for evidence in our data that would support these assumptions. We also look at how innovation is related to economic sector and the size of organisations. According to the Lisbon Agenda, innovation represents the main fuel for economic activities in European countries. For that reason, in Section 5.3.2 we look at the extent to which innovation is developed in the organisations employing young graduates in the different European countries. Then, in Section 5.3.3 we look at the extent to which graduates are working in organisations that they feel are at the forefront of innovation.

5.3.1 Market, Sector and Size as Factor Influencing the Innovation Activities of Organisations

On average, 50% of graduates declare that the extent of innovation of product or service in their organisation is high or very high. However, this percentage drops to only 28% in organisations facing very weak competition, and rises to 60% in organisations facing very strong competition (see Fig. 5.2). A similar correlation between innovation and the strength of competition can be seen in the areas of technology, tools or instruments and – to a somewhat lesser extent – of knowledge or methods. Clearly, the stronger the competition, the more innovation is required.

The scope of operations is also clearly related to the extent of innovation, especially innovation in technology, tools or instruments and product or service (see Fig. 5.3). Whereas in locally oriented organisations the proportion of organisations with a high or very high extent of innovation in these two areas is 27% and 34% respectively, and rises to 56% and 61% in internationally oriented or ganisations. The regional and national levels are placed in a more or less linear fashion between these extremes. In the case of innovations in knowledge or methods, the main contrast is between internationally oriented organisations and the rest.

There are strong differences between economic sectors in the extent of innovation (see Fig. 5.4). There is rather strong innovation in all three areas in the sectors

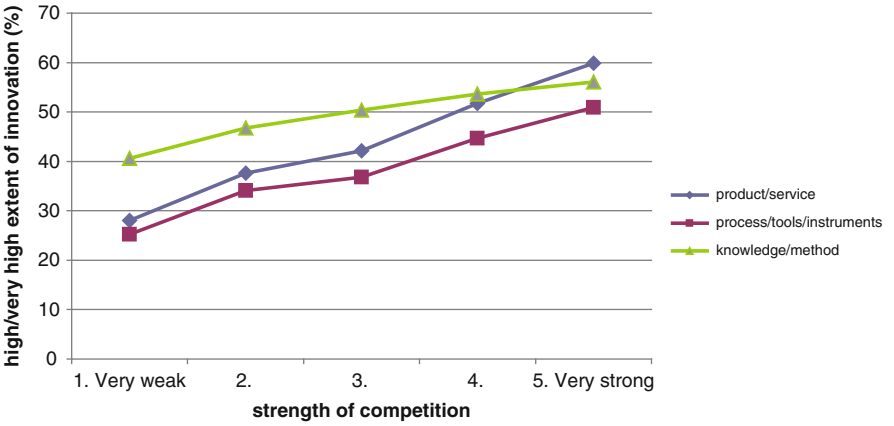

Fig. 5.2 Proportion of graduates working in an organisation where the extent of innovation is high and very high, according to the strength of competition faced by the organisation

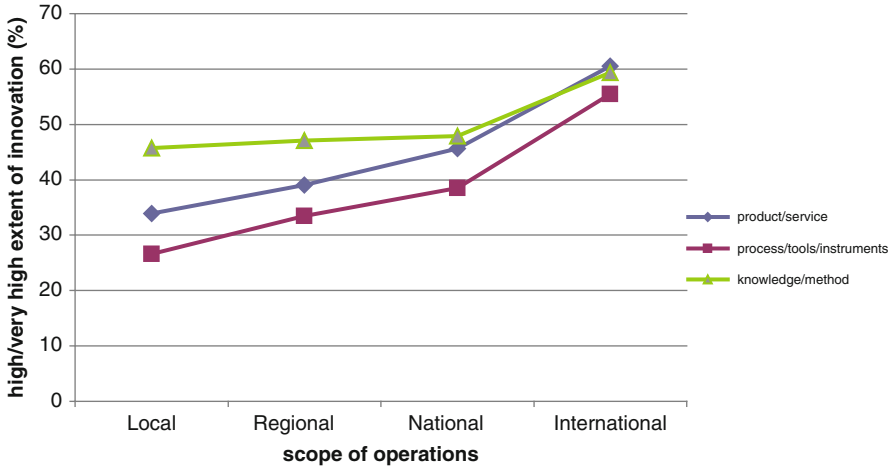

Fig. 5.3 Proportion of graduates working in an organisation where the extent of innovation is high and very high, according to the scope of operations of the organisation

Mining and quarrying, Real estate, Renting and business activities, Manufacturing and Transport, Public administration, Private households innovation is rather weak. In some cases, the pattern of innovation by economic sector differs quite strongly according to the type of innovation, with innovation in knowledge or methods being rather strong in sectors that are not particularly innovative in other respects, such as Education and Health and social work.

When the extent of innovation is related to the size of the organisation, it becomes clear that the largest organisations give more room to innovation than smaller ones (see Fig. 5.5). Again, the innovation of knowledge or methods seems to be less sensitive to the size of the organisation.

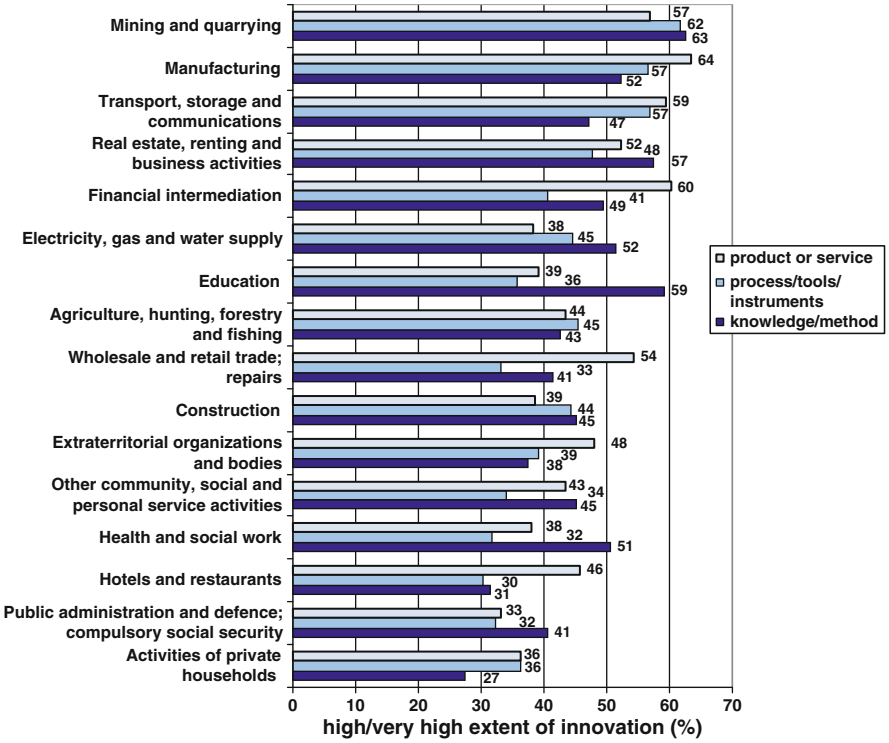

Fig. 5.4 Proportion of graduates working in an organisation where the extent of innovation is high and very high, according to the sector of activity

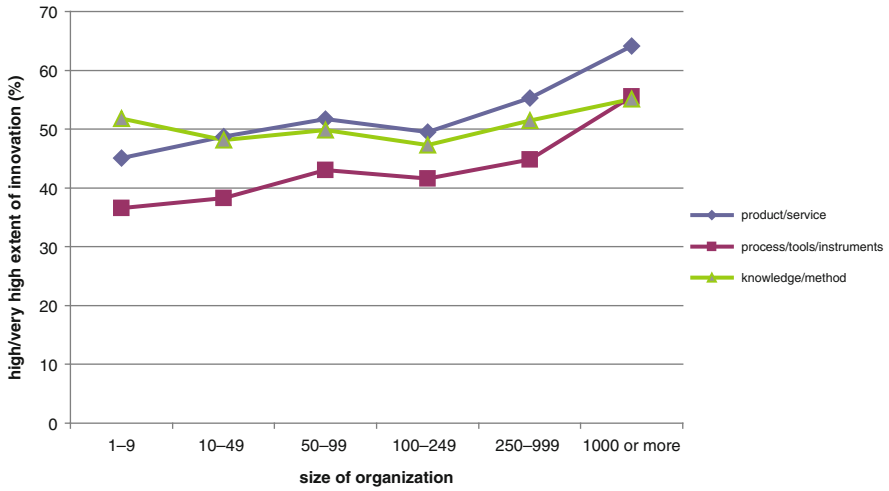

Fig. 5.5 Extent of innovation and size of organisation (private sector)

5.3.2 *Extent of Innovation in European Countries*

We now turn to the extent of innovation in different European countries, distinguishing thereby innovation in the public and private sectors. In general, private organisations appear to be more innovative, although it is striking that public sector organisations also show rather high levels (see Figs. 5.6, 5.7 and 5.8). Some strong national differences are also apparent.

The clearest distinction between the two sectors is seen in the area of product or service: 54% of graduates working in private companies across all countries report a high extent of innovation in this area, compared with 37% of graduates in public organisations. The respective proportions are 45% and 36% for the innovation

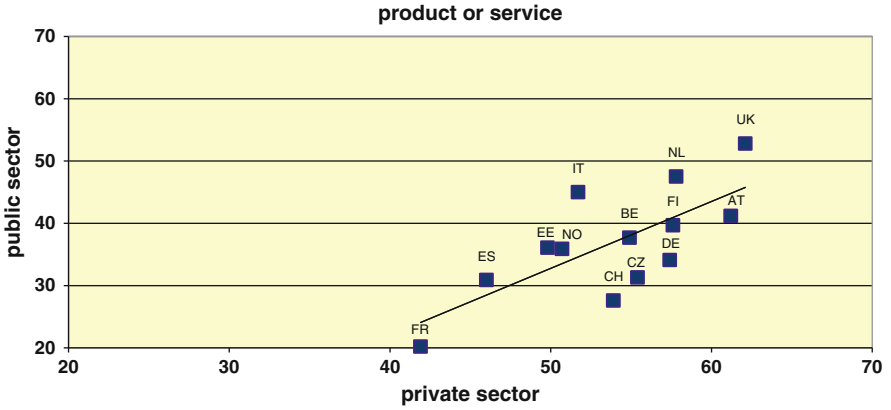

Fig. 5.6 Proportion of graduates who consider high or very high the extent of innovation in their organisation or their work with respect to the following aspects diagonal "toevoegen" plus overall "gemiddelde"

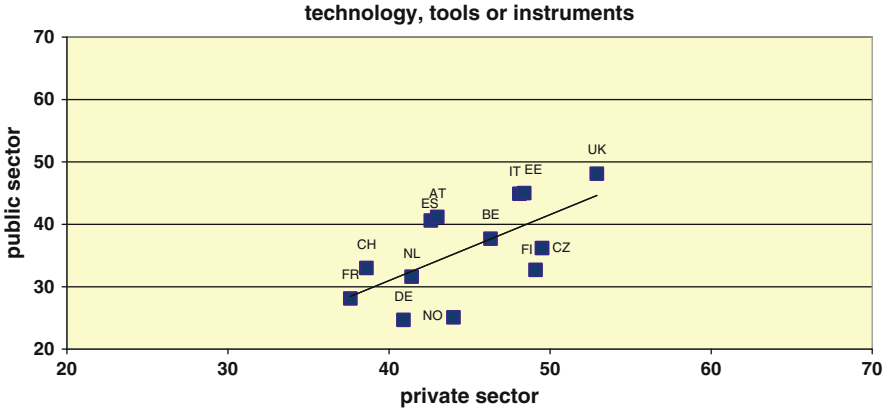

Fig. 5.7 Proportion of graduates who consider high or very high the extent of innovation in their organisation or their work with respect to the following aspects

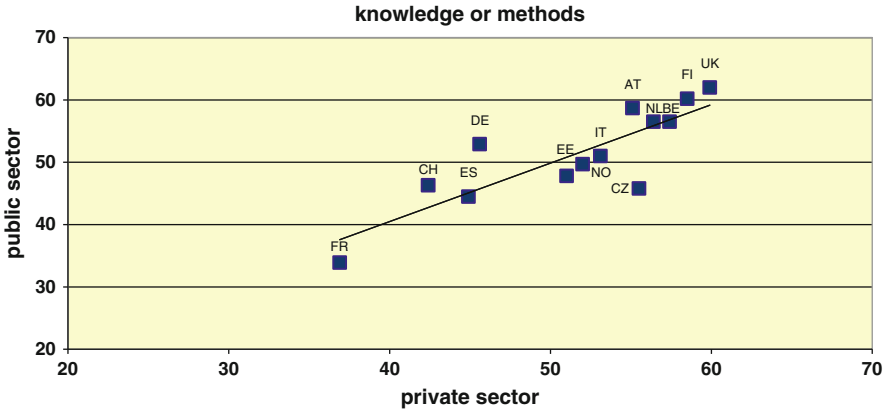

Fig. 5.8 Proportion of graduates who consider high or very high the extent of innovation in their organisation or their work with respect to the following aspects

of technology, tools or instruments. However, when innovation in knowledge or method is considered, both sectors are on equal footing, with around 51% of the graduates working in innovative organisations in both cases.

British organisations, both private and public ones, appear to be most innovative whatever the type of innovation, and Finnish and to a less extent Austrian organisations also score quite highly. French organisations, and to a somewhat lesser extent Swiss ones seem to be less innovative than their counterparts in other countries. The order of countries does vary somewhat per type of innovation and per sector, but in general the pattern is quite consistent.

5.3.3 Organisations at the Forefront of Innovation

As mentioned above, the REFLEX survey contained a different question concerning the position of the company in terms of innovation. This question asks about the extent to which graduates felt that their organisation was more at the forefront in terms of innovation or more a follower. Information gained from this question provides a complementary perspective on innovation by organisations in which graduates work. We first look at the position of countries in terms of this indicator, and look at how it is related to characteristics of organisations and market in which they operate. Following this, we will compare this information provided by the REFLEX survey with data derived from the European Innovation Scoreboard (EIS).

Figure 5.9 shows the percentage of graduates working in the private sector per country who answered 1 or 2 to the question "Is your organisation normally at the forefront when it comes to adopting innovations, new knowledge or new methods, or is it more a follower?" What is immediately striking from this is that the pattern of differences between countries is very different from that for the extent of the

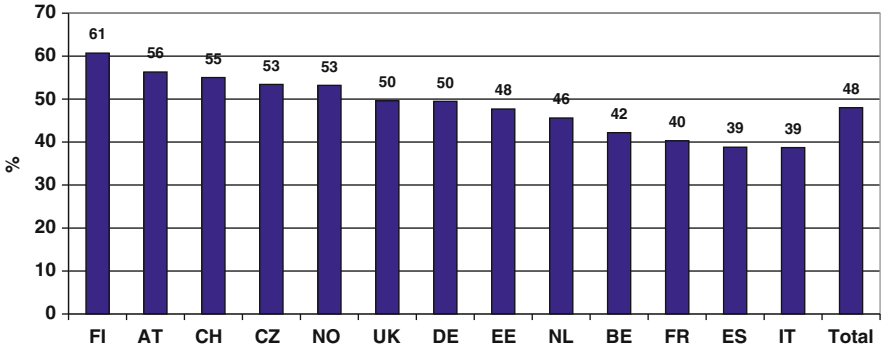

Fig. 5.9 Proportion of graduates working in organisations at the forefront of innovation by country (private sector)

three types of innovation. The main similarity is the low position of France on all four measures, but the position of other countries is quite different. For example, whereas the UK scored highest of all countries in terms of extent of innovation, it is around the middle of the range in terms of being at the forefront. Finland, Austria and Switzerland come to the fore in terms of being at the forefront of innovation, whereas particularly the latter country showed quite a low extent of innovation. At the bottom of the distribution, organisations from the three "southern" European countries of the sample, France, Spain and Italy, look more frequently like followers.

Despite the different pattern in terms of country rankings, the main characteristics of organisations at the forefront of innovation appear close to the ones already observed for organisations involved in innovation to a high extent. Half of graduates (52%) working in private companies facing a very strong competition declare these organisations are at the forefront of innovation; this is the case for 38% of graduates in organisations where the strength of competition is very weak (see Fig. 5.10).

The same holds true for the scope of operations. Graduates working in organisations with an international scope of operations declare more frequently that they are at the forefront of innovation (58% against 33% for private companies and 55% against 26% for public organisations) (see Fig. 5.11). When the size of the organisation is considered, large organisations appear more frequently at the forefront of innovation, at least in the private sector: 58% of graduates working in private companies with more than 1,000 employees consider their company at the forefront in innovation against 39% for graduates in organisations smaller than 10 employees (see Fig. 5.12). The proportion increases uniformly with size. Interestingly, there is little relation between size and being at the forefront of innovation in the public sector. Very small organisations are slightly less likely to be at the forefront of innovations, but for organisations with 10 or more employees there is no systematic relation with size.

The chance of being at the forefront also varies with economic sector. Whereas more than half of graduates working in "Mining and quarrying", "Manufacturing",

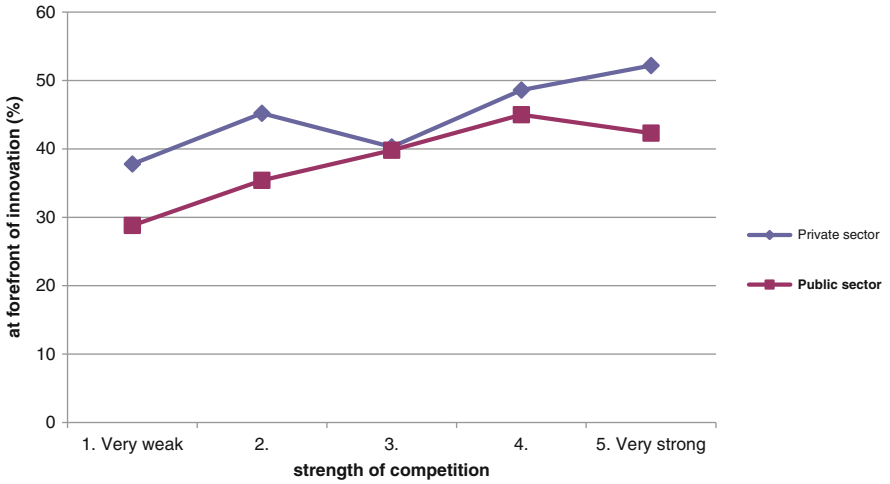

Fig. 5.10 Proportion of graduates working in organisations at the forefront of innovation, and strength of competition

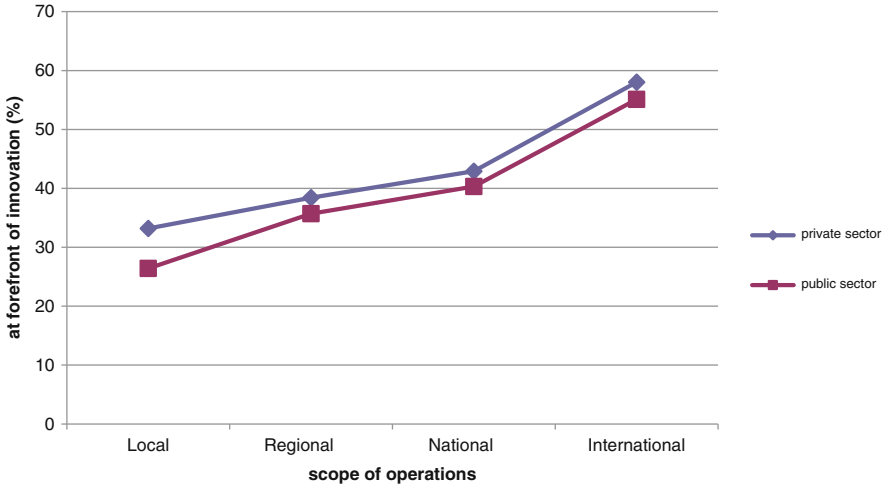

Fig. 5.11 Proportion of graduates working in organisations at the forefront of innovation, and scope of operations

"Electricity, gas and water supply" and "Transport, storage and communications" consider their company to be at the forefront of innovation, only 30% of graduates working in "Public administration" and "Extraterritorial organizations" do so (see Fig. 5.13).

It is interesting to compare the ranking of countries according to this indicator with that provided by the "European Innovation Scoreboard, 2006/ Comparative

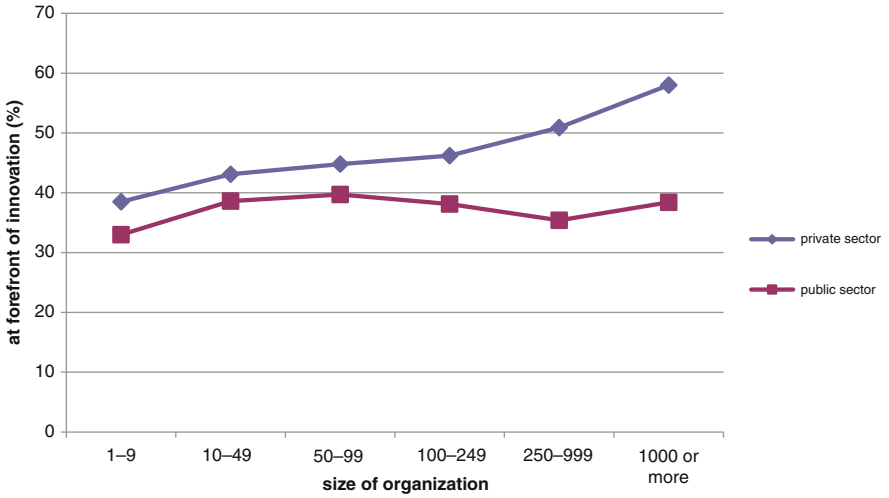

Fig. 5.12 Proportion of graduates working in organisations at the forefront of innovation, and size of organisation

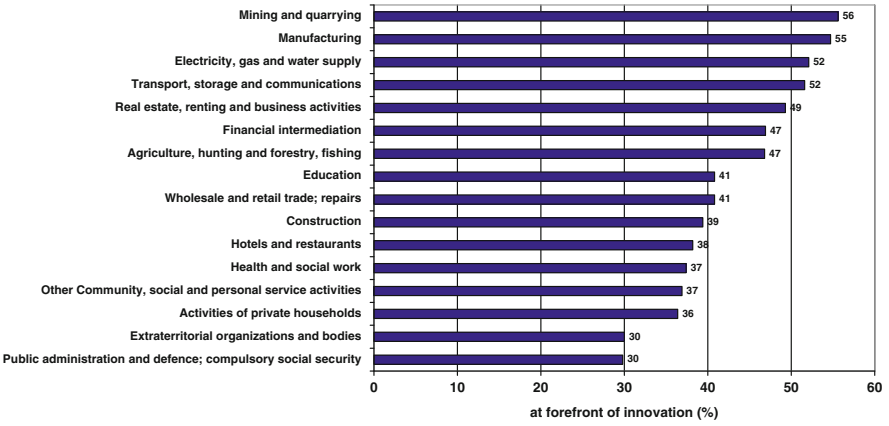

Fig. 5.13 Proportion of graduates working in organisations at the forefront of innovation, and sector of activity

Analysis of Innovation Performance" prepared for the European Commission, under the Lisbon strategy. Obviously, it is difficult to compare our results with those presented in that report, since it uses 25 indicators, split into five main categories (input/innovation drivers, input/knowledge creation, input/innovation and entrepreneurship, output/applications and output/intellectual property) to evaluate and to compare the innovation performance of the EU member states and some other countries. Seven indicators have been selected for the comparison, which seem to be more directly related to innovation in organisations and to innovative employment:

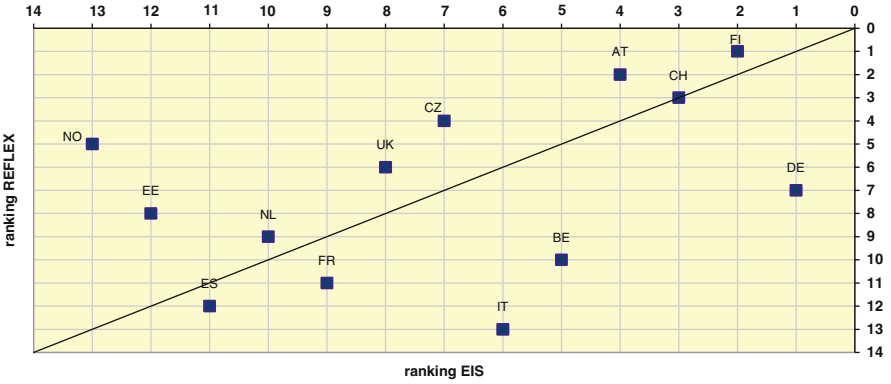

Fig. 5.14 Ranking of countries according to the European innovation scoreboard indicators and to the REFLEX survey

business R&D expenditures (% of GDP), share of medium-high-tech and high-tech R&D (% of manufacturing R&D expenditures), share of enterprises receiving public funding for innovation, SMEs using organisational innovation (% of all SMEs), sales of new-to-market products (% of total turnover), sales of new-to-firm products (% of total turnover) and employment in medium-high-tech and high-tech manufacturing (% of total workforce). Figure 5.14 compares the ranking according to these selected EIS indicators with the ranking based on the proportion of graduates working in the private sector whose organisations were considered to be at the forefront of innovation.

Obviously, the results don't match exactly, but most countries (Finland, Switzerland, Austria, the UK, France, the Netherlands and Spain) are ranked at a comparable level according to both two classifications. The strongest exceptions are Germany, Belgium and Italy, which appear more innovative in the EIS classification, and Norway, which scores much higher according to the REFLEX indicator. It is not surprising that the match is not perfect, since the EIS indicator is based on a range of indicators that reflect the whole economy in a country, while the REFLEX indicator is based on the assessment of recent higher education graduates working in the private sector. Surveys such as REFLEX can complement the information gathered through other sources, and may offer the opportunity for a discussion about the place and the role of graduates regarding innovation.

5.4 The Role of Graduates in Introducing Innovations

As we have seen, private companies in which graduates work are more often innovative than are public sector organisations. When we consider lower levels of innovation as well, it turns out than 90% of private companies where graduates work innovate at least to some extent in terms of product or service, compared to 79% for

public organisations. The corresponding proportions are 85% and 77% for technology, tools or instruments, and 91% and 88% for knowledge or methods. However, the fact that an organisation is involved in innovation does not necessarily mean that graduates themselves play a role in introducing these innovations. In this section we look at the extent to which graduates actually participate in the innovation process, and examine how this is related to their work tasks and other characteristics of their organisations.

5.4.1 The Participation of Graduates in the Innovative Process

Only 36% of graduates report that they play a role in introducing innovations in their organisation in terms of technology, tools or instruments. This rises to 47% for innovations in product or service and 61% for innovations in knowledge or methods. Figures 5.15, 5.16 and 5.17 shows the percentages per country separately for those working in the public and in the private sector.

In most countries, innovation opportunities for graduates are less frequent in the public sector in terms of product or service and technology, tools or instruments, but this is no longer the case when we look at innovation in terms of knowledge or methods. In most countries, a comparable or even higher proportion of graduates working in the public sector report that they play a role in introducing this kind of innovation compared to their private-sector counterparts. Graduates from Nordic countries (Norway and Finland) seem to be more frequently involved in the introduction of all three kinds of innovation. It is interesting to note the position of Estonia and Czech Republic, since graduates in these "new" European countries appear to be frequently involved in innovation activities. By contrast, French and German graduates appear to be less involved in the innovative process.

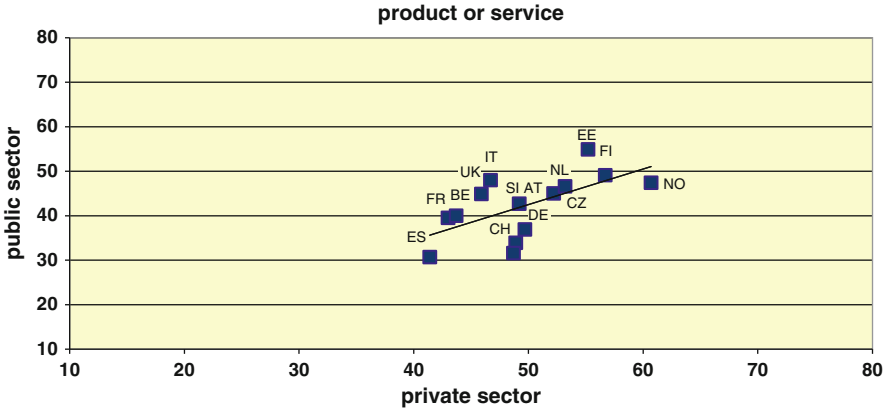

Fig. 5.15 Proportion of graduates who play a role in introducing innovations in their organisation (diagonal and overall means)

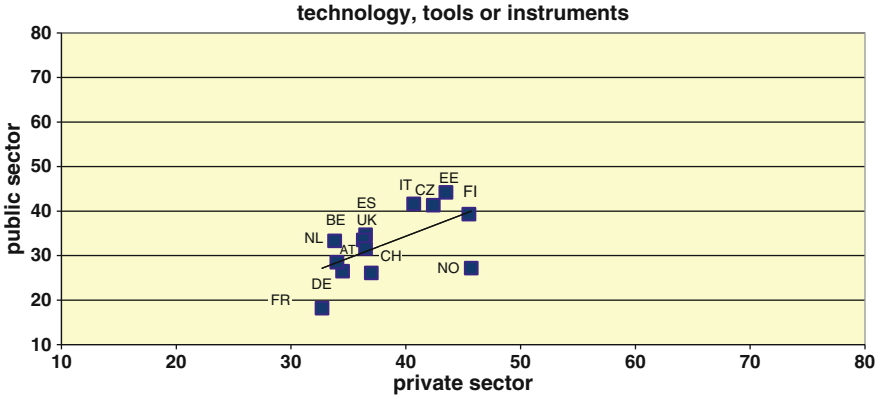

Fig. 5.16 Proportion of graduates who play a role in introducing innovations in their organisation

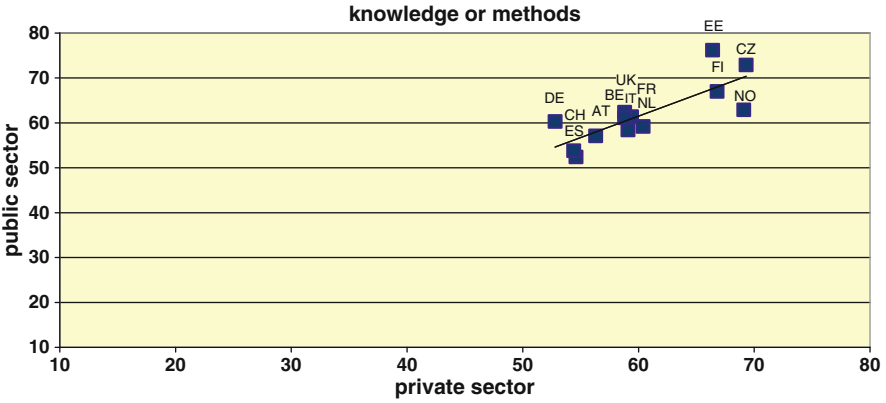

Fig. 5.17 Proportion of graduates who play a role in introducing innovations in their organisation

A characteristic of knowledge workers that is seen as highly important involves their networking activities, since innovation requires an ability to absorb ideas from outside the organisation, as Cohen and Levinthal (1990) have pointed out. The Oslo manual reminds us that "the presence of expert technological 'gatekeepers' or receptors – individuals who, through many means, keep abreast of new developments (including new technology and codified knowledge in patents, the specialised press and scientific journals), and maintain personal networks which facilitate flows of information – can be crucial to innovation within a organisation".

Graduates were asked to what extent they take the initiative in establishing professional contacts with experts outside their organisation. Those who introduce innovations are clearly engaged in active networking, since 70% of them take the initiative in contacting external experts, compared with 50% among graduates who

Table 5.1 Contacts of graduates with experts outside the organisation*, according to the role in innovation

	Plays role in introducing innovations?	
	Yes	No
Product or service	71.2	50.0
Technology, tools or instruments	70.2	45.9
Knowledge or methods	71.4	53.3

*I take the initiative in establishing professional contacts with experts outside the organisation (% 1–5 from a scale ranging from 1/not at all to 5/to a very high extent).

are not involved in introducing innovations. The proportions are practically identical for the three types of innovation (see Table 5.1).

5.4.2 Innovation and Working Environment

In order to characterise the work of graduates involved in innovative activities, a regression analysis was run (see detailed results in the appendix). The four most significant characteristics that emerged were the extent of utilisation of knowledge and skills, the demand for more knowledge and skills than possessed, the responsibility for setting one's own goals at work and the responsibility for deciding how to do one's job. Table 5.2 contrasts the answers of graduates involved in each of the three types of innovation against those not involved.

Table 5.2 Characteristics of the job content of innovative graduates

	Graduate plays role in introducing innovations?					
	Product or service		Technology, tools or instruments		Knowledge or methods	
	Yes	No	Yes	No	Yes	No
High utilisation of knowledge and skills*	76.3	68.7	77.1	69.6	77.5	63.9
More knowledge and skills required than graduate can offer*	24.0	22.4	24.9	22.1	24.0	21.8
Highly responsible for setting own goals at work*	82.9	68.8	81.2	72.2	82.4	64.2
Highly responsible for deciding how to do one's job*	87.4	76.7	86.9	78.9	87.3	72.9

*score = 4 or 5 on a scale ranging from 1 (not at all) to 5 (to a very high extent).

Whatever the type of innovation, innovative graduates utilise their knowledge and skills more intensively than graduates who play no role in innovation. In all three cases more than three quarters of them report that they utilise their knowledge and skills to a high or very high extent, against only around two thirds of graduates not involved in introducing innovations. Innovative activities don't seem to discriminate as much when it comes to the extent to which graduates' current work demands more knowledge and skills than possessed, although the differences are statistically significant. The largest differences is seen in the case of innovation involving technology, tools and instruments, where around 25% of graduates involved in such innovations declare they need more knowledge and skills than they can offer, against 22% of graduates who are not involved.

Differences are more obvious where the responsibility for the contents and execution of the job are concerned. Innovative workers are clearly more autonomous: they are more frequently responsible for setting the goals of their own work, and also for deciding how to do their job.

5.4.3 Innovation Activities and Characteristics of the Organisation

As no strong differences appeared in the previous analyses according to the type of innovation for which graduates played a role, an innovation index representing the mean score for the three types of innovation for each graduate will be used. Using a multivariate model, we relate characteristics of the organisation to the innovative role of graduates based on this index. Once again, we look at the scope of operations, the economic sector and organisation size. The results are shown in Table 5.3. Looking first at the results for scope of operations, these resemble those already seen for the extent of innovation of the organisation in which the graduate works. Graduates are more likely to be involved in innovative activities when the scope of activities of their organisation is wider. Looking at the results for economic sector, it appears that especially working in manufacturing or business and financial services promotes innovation among graduates. There is also considerable innovation in the education and health and social work sectors. However, the most striking result is found for the size of the organisation in which graduates work. Whereas larger organisations showed a much higher extent of innovation, graduates appear to be more frequently involved in innovation activities when they work in a smaller organisation. Figure 5.18 illustrates this.

Figure 5.18 shows clearly that graduates working in small organisations are more frequently involved in innovative activities than graduates hired by large organisations, both in the public and the private sector. However, most of this effect is located in the contrast between very small organisations and the rest. Whereas more than 35% of workers in organisations with less than 10 employees were involved in introducing innovations, this dropped to around a quarter of workers in slightly larger organisations of between 10 and 49 workers. Although this continues to drops off slightly with organisation size, there are still just under one in five workers in very large organisations (100 employees or more) who are involved in introducing

Table 5.3 Innovation and characteristics of the organisation

Dependent variable: Innovation index	Coefficient
Scope of operations (ref: local)	
Regional	0.15
National	0.23
International	0.56
Economic sector (ref: public administration)	
Manufacturing and other productive activities	0.35
Trade, transport and other traditional services	0.13
Business and financial services and communication	0.36
Education	0.27
Health and social work	0.27
Organisation size (ref: <10 workers)	
10–49 workers	–0.09
50–99 workers	NS
100–249 workers	–0.11
250–999 workers	–0.08
>1,000 workers	NS
Other variables in the model: country	
Adjusted R square	0.104
N	17,159

The reported coefficients are significant at 1% level.

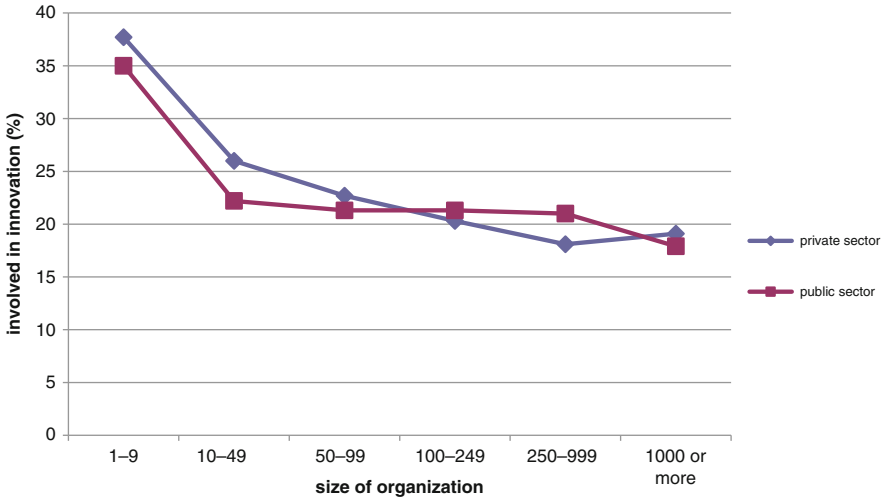

Fig. 5.18 Innovation activities according to the size of the organisation

innovations. Graduates in large organisations form just a small part of a large group of highly qualified and experienced workers, and as such are more likely to occupy positions of dependency, whereas in small organisations, they are assigned more responsibilities in terms of innovation.

5.5 Are Graduates Equipped for Innovation?

One of the main questions at the heart of this project regards the extent to which higher education institutions prepare graduates to fulfil the tasks required of them by today's knowledge and innovation societies. It is important to shed light on the links that exist between characteristics of the study programme and the ability to perform innovative activities. Three main questions will be addressed here: What are the fields of study most linked to innovation? What are the competencies most strongly related to innovation? Are innovative workers specialised?

5.5.1 Innovation Activities and Field of Study

Looking first at field of study, "engineering, manufacturing and construction" emerges as the one which produces the highest proportion of graduates who play a role in the introduction of innovation. Fifty-four percent of graduates in that field are involved in the introduction of innovations in product or service and technology, tools or instruments (see Fig. 5.19). Around two thirds of graduates in that field introduce innovations in knowledge or methods. Two other fields, "Science, mathematics and computing" and "Agriculture and veterinary" show much the same pattern. There are strong differences between fields in the proportion playing a role in introducing innovations in technologies, tools or instruments, the differences are much smaller for innovations in product or service and knowledge or methods. It is striking that the degree of innovation in the latter dimension is highest in the field of education, together with agriculture and veterinary.

The Canberra Manual, which deals with human resources in science and technology, notes the following with respect to fields of study: "some fields, like the natural sciences or engineering and technology, are often considered, at least in

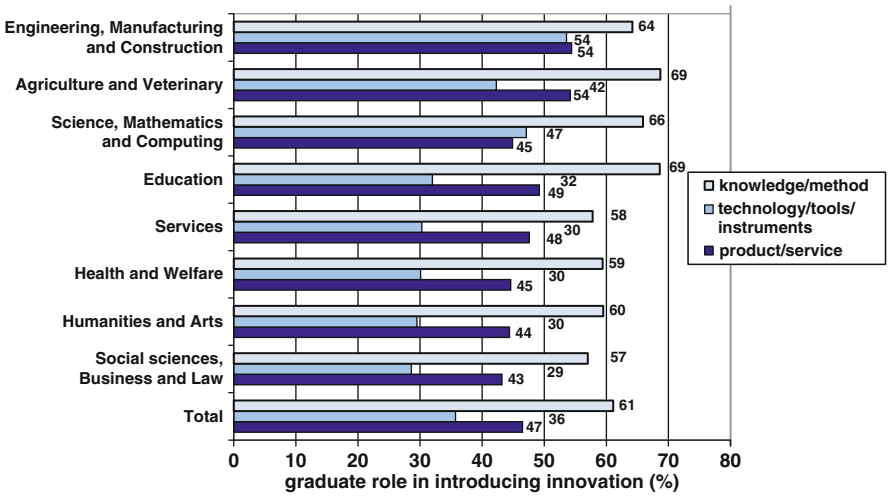

Fig. 5.19 Field of study and introduction of innovation

English-speaking areas, to be more directly relevant to S&T activities than the social sciences, humanities or other fields". This is why the manual makes a distinction within fields of study between core, extended and completed coverage. Natural sciences, engineering and technology, medical sciences, agricultural sciences and social sciences represent the core coverage, whereas humanities and other fields represent the extended coverage. This distinction appears to be consistent with the REFLEX results presented here, with the exception of the aforementioned strong position of education in the area of innovation in knowledge or /methods.

5.5.2 Characteristics of the Study Programme and Innovation Activities

How are characteristics of the study programme related to innovation activities? To answer this question, a regression analysis has been run, with the innovation index as described above as dependent variable, and various characteristics of the study programme graduates followed as predictors. Three categories of predictors can be distinguished. The first category refers to broad characteristics of the curriculum on which higher education programmes can differ, such as the degree to which it is regarded as demanding or the degree to which it is vocationally oriented. The second category refers to modes of teaching and learning, such as lectures and group assignments. The third category refers to the study behaviour of the graduates themselves while they were enrolled in the programme, such as the hours spent on study and the extent to which they strived for high marks. The significant results from this analysis are reported in Table 5.4.

Many of the predictors showed significant effects on the propensity for graduates to play a role in innovative activities, although the effects were not very strong. The strongest effects were seen for the emphasis placed in the study programme on participation by students in research projects, the degree to which the programme was regarded as demanding, and the degree to which the programme was academically prestigious. Somewhat weaker effects were seen of several modes of teaching which require students to play an active role, such as work placements and internships, project- and problem-based learning and group assignments. Somewhat strangely, there was also an effect of multiple choice exams, but no effect of more active forms of assessment such as written assignments and oral presentations. Programmes of which employers were familiar with the content, with a broad focus and a strong emphasis on theories and paradigms allowing students a high degree of freedom to compose their own programme were also related to innovation by graduates. The only aspect of study behaviour that was related to innovation was the willingness to strive for the highest possible marks.

5.5.3 How Are Competences Related to Innovation?

Taking into consideration that graduates are equipped with different types of competences, a large part of which have been developed in the higher education

Table 5.4 Regression coefficients of the characteristics of the study programme

Dependent variable: Innovation index	Coefficient
Programme characteristics:	
Generally regarded as demanding	0.04
Employers familiar with the content of programme	0.02
Broad focus	0.02
Freedom in composing your own programme	0.03
Academically prestigious	0.04
Modes of teaching and learning	
Participation in research projects	0.05
Internships, workplacement	0.03
Theories and paradigms	0.03
Group assignments	0.02
Project and/or problem-based learning	0.03
Multiple choice exams	0.02
Description of study behaviour:	
Strived for the highest possible marks	0.02
Other variables included in the model: country, field of study, level of degree, gender	
Adjusted R square	0.085
N	17,942

The reported coefficients are significant at 1% level.

programme, it is important to observe how these are linked to the three types of innovation. To identify the competences most strongly related to each type of innovation, the probability that the graduate plays a role in introducing each of these types of innovation has been regressed separately on each of the 19 competences acquired by graduates, controlling for country of graduation. The competences that showed a regression coefficient higher than 0.2 are identified as the most relevant competences for each type of innovation. This resulted in six competences that are highly relevant for the introduction of innovation of product or service, four for the introduction of technology, tools or instruments, and nine for the introduction of knowledge or methods.

Figures 5.20, 5.21 and 5.22 show the means of these competences for graduates who play a role in the introduction of each type of innovation and for those who play no role.

The competences which differentiated most between those who play a role in introducing innovations in terms of product or service and those who don't are competences commonly associated with the qualities of a researcher: the ability to come up with new ideas and solutions, the willingness to question your own and others' ideas, and alertness to new opportunities (see Fig. 5.20). Also important are some competences related to working in groups: the ability to coordinate activities and the ability to mobilise the capacities of others. Strong communication capacities also seem useful, such as the ability to present products, ideas or reports to an audience.

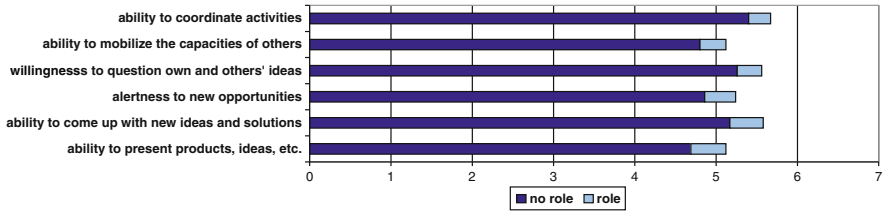

Fig. 5.20 Means of the most differentiated competences (Introduction of innovation of product or service)

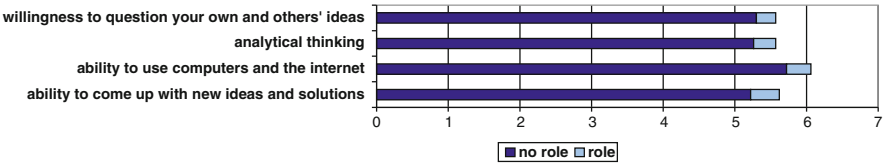

Fig. 5.21 Means of the most differentiated competences (Introduction of innovation of technology, tools or instruments)

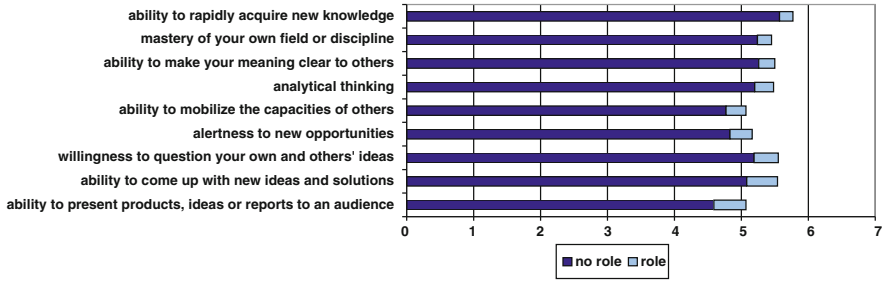

Fig. 5.22 Means of the most differentiated competences (Introduction of innovation of knowledge or method)

When the introduction of innovations in terms of technology, tools or instruments is considered, only four competences strongly distinguish graduates who play a role in introducing this type of innovation and those who don't (see Fig. 5.21). These are also mostly typical researchers' competences: the ability to come up with new ideas and solutions, analytical thinking and the willingness to question your own and others' idea, but in this case computer and internet skills are also important.

The situation is quite different in the case of the third type of innovation, involving knowledge or methods. In this case, nine competences clearly distinguish those who play a role in introducing innovations from those who don't. There is a strong overlap with the competences linked to innovation in terms of product or service, but academic competences, such as the mastery of one's own field or discipline are also important (see Fig. 5.22).

Table 5.5 Field specialisation and innovation

	Graduate plays role in introducing innovations?					
	Product or service		Technology, tools or instruments		Knowledge or methods	
	Yes	No	Yes	No	Yes	No
Exclusively own field	30.7	33.0	31.1	32.4	32.4	31.3
Own or a related field	55.8	50.8	56.5	51.3	55.2	50.0
A completely different field	6.6	6.9	6.4	7.0	6.0	7.8
No particular field	6.8	9.3	6.0	9.3	6.3	10.9

5.5.4 Are Knowledge Workers Specialised?

According to Peter Drucker (1959), knowledge workers are supposed to be highly specialised. To investigate this assumption, we looked at the graduates' response to the following question: "what field of study do you feel is most appropriate for your current work?" In Table 5.5 we show the distribution of answers to this question for those who play a role in introducing the three types of innovation compared to those who don't.

The most striking result in Table 5.5 is that the vast majority of graduates are highly specialised in their work, regardless of their situation in relation to innovation. More than 80% consider either exclusively their own or their own or a related field to be most appropriate field for their current work. We do see that graduates who are involved in innovative activities appear to be a bit more specialised than those who are not: around 88% of them consider their own field or a closely related field to be a prerequisite for their work.

5.6 Innovation, Occupations and Rewards

In this section we look at the relation between occupations and innovation, as well as the impact of innovation activities on earnings.

5.6.1 Occupations and Innovation

Figure 5.23 shows the percentage of graduates who play a role in introducing innovations for the main occupational groups in which graduates work. These 18 occupations, in which at least 2% of graduates work, represent 70% of all working graduates.

There is a strong relation between the three types of innovation when it comes to the occupational groups in which graduates play a strong role. All three types of innovation score highly among various categories of managers, while business, finance and legal professionals, as well as administrative associate professionals,

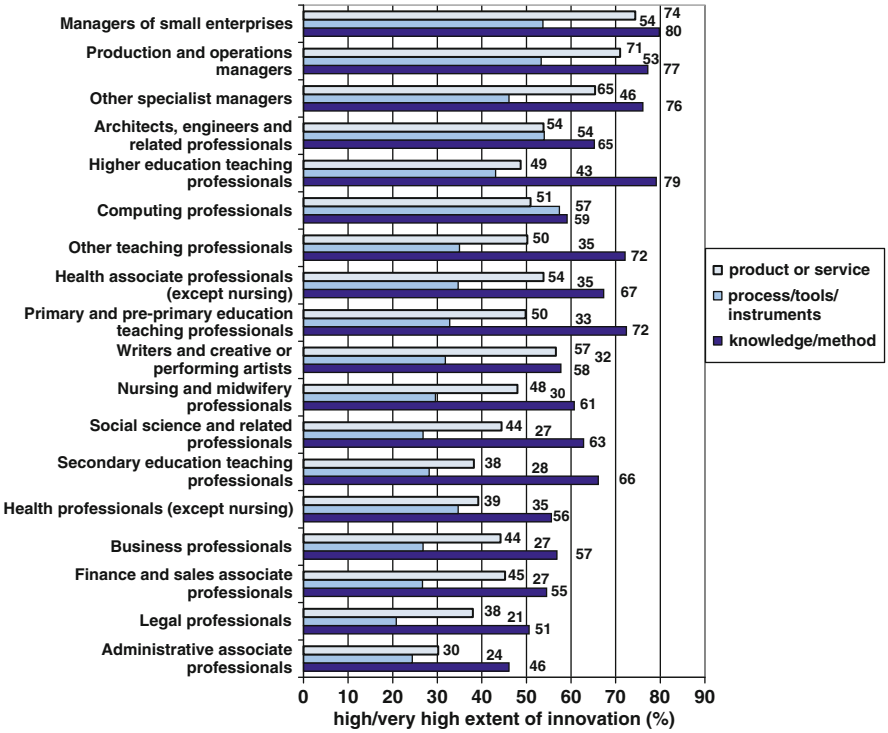

Fig. 5.23 Participation in innovative activities by occupation

score quite low in all respects. There are some occupations in which graduates are strongly involved in certain types of innovation but much less in others. In general, graduates are much more involved in introducing innovations in terms of knowledge and methods across the full spectrum of occupations than in introducing the other two types. Particularly teaching professionals stand out in this respect. The results underscore the observation that innovation is not only limited to technical matters.

These findings can be related to the classification of occupations proposed by the Canberra Manual. The core occupations according to this manual are physical, mathematical and engineering science professionals (such as physicists, chemists, operations research analysts, computer systems engineers, architects and mechanical engineers), and life sciences and health professionals. Extended occupations include production and operations department managers, general managers, teaching professionals (university professors, school teachers), physical and engineering science associate professionals, life science and health associate professionals, lawyers and economists. Although our results are mostly consistent with this classification, according to our results managers may belong more in the core than in the extended category, since they appear clearly as one of the occupations most concerned with innovation. Unsurprisingly, the same comment applies to the teaching professionals, who consider innovation to be a central part of their duties.

Table 5.6 Relative earnings of innovative activities

	Coefficient		
Dependent variable: Logarithm earnings main job	Private sector	Public sector	All
Role in introduction of innovation:			
Product or service	0.06	0.05	0.05
Technology, tools or instruments	0.03	NS	0.03
Knowledge or methods	0.05	NS	0.06
Other variables included in the model: countries, sector, gender, level of degree, total working hours main work, size of the organisation			

The reported coefficients are significant at 1% level.

5.6.2 Are Innovation Activities Rewarded?

Regression analysis allows us to determine whether innovation activities are rewarded, and if so to what extent. The results of this regression analysis is shown in Table 5.6. The results show that it is worthwhile to play a role in the introduction of innovation. In the private sector, the earnings premium for introducing innovations in terms of product or service and of knowledge or methods is around 5–6% and that for innovations in terms of technology, tools or instruments is 3%. In the public sector, only innovation in terms of product or service is rewarded, adding 5% to graduates' earnings.

5.7 Conclusions

The concept of the knowledge and information society(/ies) has undoubtedly become a reality in Europe. The results presented in this chapter confirm that innovation represents an important tool in the day-to-day life of most organisations, especially those confronted with strong competition and globalisation. Surveys like REFLEX offer a complementary perspective to surveys specifically dedicated to innovation activities in organisations. The extent of innovation as perceived by graduates differs from country to country, based on differences in the economic, social and political climate, in the culture, and in the representation of the different sectors of economic activity.

Graduates are crucial actors in this innovation process: more than half report that they play a role in introducing innovations in their organisation. Innovations are not restricted to industrial processes, but are also important in service sectors, even in the public sector (education, health). Innovative graduates play the role of knowledge workers and expert technological gatekeepers. Their jobs show a number of specific characteristics: a high level of autonomy, more leeway to define their own goals and to perform their tasks.

An interesting paradox that emerged in this chapter is the following: although innovation is more strongly developed in large organisations, small organisations offer graduates more opportunities for graduates to play a role in introducing innovations. This is because graduates working in large organisations form just a cog in a very large wheel, whereas those working in small organisations are in a position to strongly influence the course followed by those organisations.

Graduates who play a role in introducing innovation have quite a specific competence profile, scoring highly on typical researchers' competences, on teamworking competences and on field-specific knowledge and skills. The study programmes of graduates involved in innovation are frequently demanding, and offer good opportunities to participate in research projects and internship. Modes of teaching involving an active participation by students, such as project- and problem-based learning, also seem to provide a good basis for preparing graduates to be part of the innovation society.

When earnings are considered, innovative activities appear to be rewarded, in the private sector. That confirms the impression that innovation is recognised as valuable by organisations.

Appendix: To What Extent Innovative Activities Are Related to a Specific Working Environment?

Dependent variable: innovation index	Role in innovation of product			Role in innovation of technology			Role in innovation of technology		
	B	SE	Sig.	B	SE	Sig.	B	SE	Sig.
Responsible for setting goals for own work	0.297	0.019	0.000	0.208	0.020	0.000	0.357	0.018	0.000
Responsible for deciding how to do own job	0.191	0.021	0.000	0.164	0.022	0.000	0.219	0.021	0.170
Performance monitored closely by supervisor	0.012	0.011	0.252	–0.018	0.011	0.107	0.015	0.011	0.014
Work demands more knowledge and skills than you can actually offer	0.025	0.015	0.089	0.058	0.016	0.000	0.039	0.016	0.000
Knowledge and skills utilised in work	0.153	0.017	0.000	0.197	0.018	0.000	0.276	0.017	0.316
Public sector	–0.336	0.033	0.000	–0.196	0.034	0.000	0.034	0.034	0.000
Female	–0.327	0.032	0.000	–0.756	0.033	0.000	–0.324	0.033	0.102
Italy	0.046	0.073	0.531	0.398	0.076	0.000	0.124	0.075	0.828
Spain	–0.313	0.073	0.000	0.281	0.077	0.000	0.016	0.075	0.021
France	–0.262	0.078	0.001	0.288	0.082	0.000	0.185	0.080	0.000
Austria	–0.293	0.076	0.000	–0.182	0.082	0.026	–0.311	0.079	0.000
Germany	–0.338	0.073	0.000	–0.412	0.080	0.000	–0.308	0.074	0.642
United Kingdom	–0.084	0.076	0.270	0.053	0.081	0.513	0.037	0.079	0.019

(continued)

Dependent variable: innovation index	Role in innovation of product			Role in innovation of technology			Role in innovation of technology		
	B	SE	Sig.	B	SE	Sig.	B	SE	Sig.
Finland	0.205	0.071	0.004	0.468	0.074	0.000	0.176	0.075	0.017
Norway	0.195	0.070	0.005	0.104	0.074	0.161	0.175	0.073	0.000
Czech Republic	0.044	0.070	0.537	0.510	0.073	0.000	0.560	0.077	0.003
Switzerland	–0.200	0.073	0.006	–0.077	0.078	0.323	–0.225	0.075	0.486
Belgium	–0.303	0.078	0.000	0.075	0.082	0.363	–0.056	0.080	0.000
Estonia	0.214	0.088	0.015	0.492	0.091	0.000	0.399	0.096	0.000
Ref: Netherlands									
Intercept	–2.460	0119	0.000	–2.690	0.127	0.000	–2.990	0.121	
-2 log likelihood	23856			22280			22533		
Cox & Snell R-squared	0.071			0.075			0.099		
Nagelkerke R-squared	0.095			0.103			0.135		

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Chapter 6
Mobilization of Human Resources

Jim Allen

6.1 Clarifying Concepts

In a sense, this chapter is something of an oddity in the context of this report. It is only a slight exaggeration to say that the report as a whole is about different kinds of human resources of higher education graduates, and most chapters pay attention among other things to the mobilization of the particular type of resource that is the subject of the chapter. In this chapter, the focus is on the mobilization of human resources in general. The oddity lies in the fact that the ability to mobilize human resources is itself a human resource. In particular when the discussion turns to the competences which are thought to be especially relevant to mobilization of human resources, things can get a little confusing. We may even find ourselves in a situation where we are describing the degree to which competences important for mobilization are themselves being mobilized.

At an abstract level, it looks deceptively simple to define the subject of mobilization of human resources. In large part as a result of the learning that takes place in higher education institutions in different countries, there is at any given moment a certain stock of human capital that could, at least in principle, be put to productive use in the economy. Economic growth can be achieved not only by increasing this stock of human capital, but also by increasing the *proportion that is actually being put to productive use*. The main idea of this chapter is that higher education has an important role to play in this latter area as well as the former, by teaching its participants how to put their own knowledge and skills to good use, as well as how to play a role in mobilizing the competences of other people with whom they work.

If higher education does play such a role, this should be reflected in the ways in which human resources are mobilized *in higher education*. One might expect that graduates who actively mobilize their own and others' resources after leaving higher education already start doing so in higher education. This is not only a matter of

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putting in long hours at study, but should involve a high degree of motivation to get more out of their study than what is minimally required to pass exams. In addition, there are often ample opportunities for students to mobilize their own capacities by taking part in various extra-curricular activities, such as paid work, positions in student or voluntary organizations, or time spent abroad. It is important to take into account the possibility that engaging in such extra-curricular activities might leave students with less time to spend on their studies. More generally, it is important to look at features of higher education that are related to a high degree of study effort and motivation.

At the most basic level, the first thing to look at when describing the mobilization of human resources *after graduation* is whether they are being mobilized at all. In other words: do graduates participate in the labour force, and if so are they in paid employment? In general we can say that it is better for graduates to work than not to work, but there may be a large amount of variation among those participating in the labour force in terms of the *extent* to which human resources are being mobilized. Not every working graduate is necessarily employed for a full working week. This is of course not always a bad thing: part-time work may provide opportunities for some graduates taking care of young children, or for participation in further education and training.

For those who work, whether this is full-time or part-time, a more important consideration is the extent to which they are able to make use of their full potential in the time they spend at work. There is an extensive literature on this subject, most of which falls under the general heading of overeducation (see e.g. Cohn & Khan, 1995; Duncan & Hofman, 1981; Hartog & Oosterbeek, 1988; Hersch, 1991; Sicherman, 1991; Van Smoorenburg & Van der Velden, 2000). Although working in a job requiring one's own level (or, in some cases, one's own field) of education is something most graduates would strive for, this is neither a necessary nor a sufficient condition for mobilizing one's own capacities (see e.g. Allen & van der Velden, 2001). In particular, graduates can acquire skills that help them to mobilize their own capacities even when they are working in jobs other than they were trained for. In the context of this chapter, in which the focus is about the ability to mobilize resources as well as the actual mobilization, this is an important point.

Things get more complicated when we consider the fact that higher education graduates are not only responsible for mobilizing their own capacities, but can also be called on to help mobilize the capacities of other workers. It should be stated at the outset that our data don't allow anything like a comprehensive analysis of this aspect of mobilization. The main limitation is that we have almost no information at all about who these others are. Are they other higher education graduates, or workers with a lower level of education? What kind of work are these other workers doing? And in particular: to what extent are these workers utilizing their capacities, and what is the contribution of the graduates in our survey to this? These are questions we simply cannot answer. We can, however, answer other important questions, such as: To what extent are graduates expected to work with, and particular to monitor and supervise, others? To what extent is the output of graduates interdependent with that of co-workers? To what extent do graduates bear responsibility for setting goals

or deciding strategies for the organizations in which they work? And what kinds of competences are they required to use in fulfilling these duties?

This chapter is not just about describing the extent to which graduates mobilize their own capacities, or are involved in mobilizing those of their co-workers. At least as important is to try to uncover the factors that contribute to this mobilization. A basic assumption underlying this chapter is that graduates are not entirely at the mercy of the work situation they find themselves in for the mobilization of competences, but can actively strive to increase the level of mobilization even when the objective conditions are unfavourable. Higher education has a role to play, by teaching its students how to put the available human resources – whether their own or others' – to good use. How well higher education plays this role is a key element of the chapter.

If we manage to establish that higher education indeed has the capacity to influence the level of "mobilization" competences, the next step is to see whether this actually results in more mobilization. In doing so, it should be kept in mind that there are limits to what higher education and higher education graduates can do. Mobilization is likely to be influenced as much or even more by the characteristics of the firms and organizations in which graduates work. A key focus of this project is to establish whether firms and organizations do what they need to do in order to get the best out of higher education graduates.

In the next section we describe various indicators for the degree of mobilization of one's own resources in higher education: study hours, intrinsically and extrinsically motivated study behaviour, and extracurricular activities, and use several multivariate analyses to determine which features of higher education are related to a high degree of study effort. We subsequently look at how graduates rate their own study programmes as producers of competences that are thought to be relevant to mobilizing human resources, and look for features of higher education that are related to high acquired levels of these competences. In the next section we describe various indicators for the degree of mobilization of one's own resources: labour force participation and working hours, participation in activities outside the world of work, the education-job match and (under)utilization. Following that we move on to a description of several indicators of mobilization of the capacities of others, including supervision, quality control and strategic decision-making authority. Sections 6.5 and 6.6 contain a number of multivariate analyses aimed at exposing some important determinants of the utilization of one's own capacities and the mobilization of others' capacities. Section 6.7 comprises a brief conclusion.

6.2 Mobilization of Human Resources During Higher Education

The data contain a number of indicators of the mobilization of human resources by students during their time in higher education. Several of these refer to the amount of effort made by students to achieve good study results: the amount of time spent each week on studying, doing extra work above what is required to pass

one's exams and striving for higher grades. In addition, and potentially important in preparing students to mobilize their own and others' resources after graduation, we have information on various kinds of other experiences gained while enrolled in higher education. After describing these features, in this section we will present the results of a series of regression analyses aimed at uncovering features of higher education that are related to a high degree of effort by students.

6.2.1 Study Behaviour

Figure 6.1 shows three different indicators of the amount of effort students put into achieving good results. The most seemingly straightforward of these is the total amount of time spent on average on studying (including lectures, internships etc.). A limitation of this indicator is that it may be influenced negatively by students' ability and/or efficiency: in order to achieve the same results, less gifted students, or students who are less efficient in their use of time, will need to spend more hours studying just to achieve the same results as their more talented and/or efficient peers. Particularly the possible relationship with time efficiency is potentially problematic when we wish to consider this as an indicator of mobilization of one's own human resources. For this reason, we include two additional indicators. The first indicates the degree to which students did extra work during higher education above what was needed to pass their exams. This can be regarded as an indicator of intrinsic study motivation, since it is not related to any obvious rewards in terms of demonstrable study achievement. In contrast, the second indicator, the extent to which students strive for higher grades, is more an indicator of extrinsic study motivation, since such grades can improve graduates' CVs.[1] Fig. 6.1 shows the distribution of the three indicators across the participating countries.

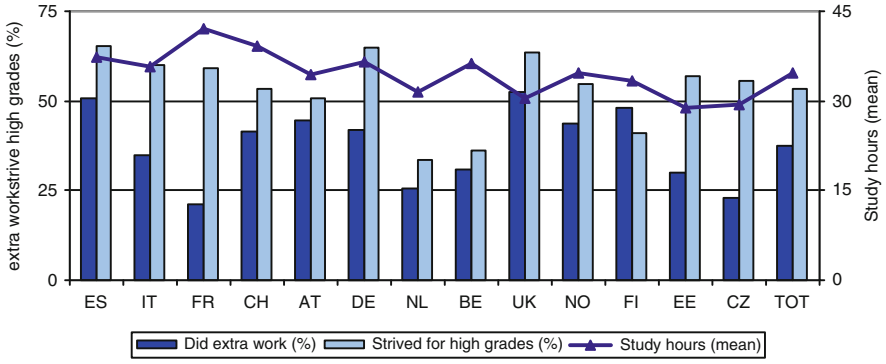

Fig. 6.1 Study behaviour, by country (%)

[1] Both of these indicators are measured on a 5-point scale ranging from 1 "not at all" to 5 "to a very high extent". Figures 5.1 and 5.2 present the percentage of answers 4 or 5.

According to the three indicators, the effort that European students put into achieving good study results in higher education is moderate at best. Although students report working close to a full-time working week on their study (slightly less than 35 h per week; this rises to 37 h for full-time students), only 37% of graduates reported doing substantial extra work above what was required to pass their exams. A higher percentage (but still only slightly more than half) reported that they strived for the highest possible grades, suggesting that the study motivation of European graduates is more extrinsic than intrinsic.

Figure 6.1 reveals large differences between countries in all three indicators. Study hours vary from less than 30 in Estonia and the Czech Republic to more than 42 in France. The other two indicators also vary greatly between countries. With the exception of Finland, more graduates in each country indicated that they strived for high marks during higher education than that reported doing extra work above what was required to pass exams. Only in Spain and the UK do more than half of graduates report having done substantially more work than needed to pass exams, compared to a quarter or less in France, the Czech Republic and the Netherlands. Spanish and British graduates are also among the top with respect to striving for higher grades, together with their German peers. Around two thirds of graduates in these countries reported that they strived for higher grades, compared to only around a third of Dutch and Flemish graduates. In general, there is little relation between the mean study hours in a country and the other two indicators. A notable exception is the Netherlands, which combines below average study hours with low levels of both extrinsic and intrinsic study motivation. Figure 6.2 shows the same indicators by level and type of education.

Second-level graduates report slightly higher study hours than first-level graduates. The differences by field are more pronounced. At both levels graduates in the "harder" fields such as Engineering or Health report much higher study hours than graduates in the "softer" fields like Humanities or Social Sciences. The order is almost reversed for the other indicators: Humanities graduates report the highest levels of both intrinsic and extrinsic motivation, while Engineering graduates report quite low levels.

6.2.2 Other Experiences During Higher Education

Figure 6.3 shows the total number of months that students spent acquiring various kinds of other experience while in higher education.[2] In terms of mobilization of human resources, these indicators have rather mixed meanings. At a general level one might argue that any kind of additional activity is a sign of an active attitude and

[2]It should be noted that the number of months says nothing about the amount of time spent each month on the activity in question. It is likely that some activities, particularly experience abroad and internships, are more or less full-time activities, while others, particularly voluntary positions, may involve no more than a few hours each month.

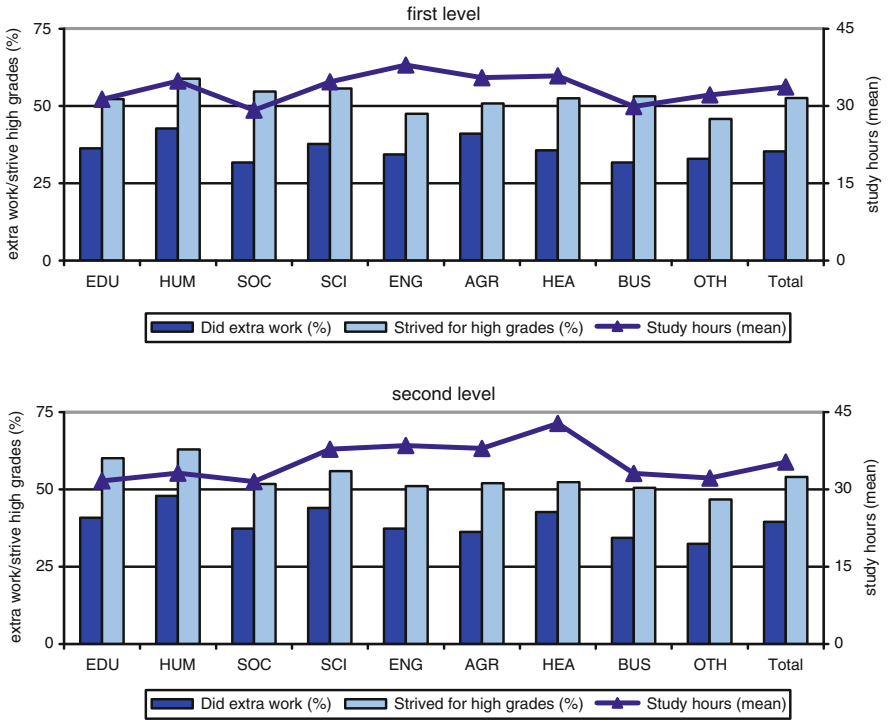

Fig. 6.2 Study behaviour, by field and level of education (%)

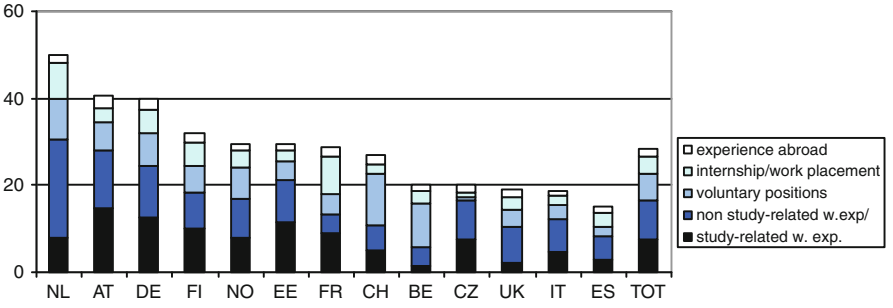

Fig. 6.3 Experiences during higher education, by country (months)

is therefore positive. However, some activities, in particular non-study-related work experience, are probably undertaken mainly for instrumental reasons and have little bearing on what students hope to do after graduating. In contrast to internships, other study-related work experience and experience abroad may prove highly relevant to graduates' later career development. Voluntary positions occupy an intermediate place: while in most cases probably not directly related to graduates later career

in terms of substance, such experience can help students develop assertiveness and leaderships skills that may prove invaluable.

Most striking in Fig. 6.3 are the large differences between countries. Even taking into account the fact that the number of months is a far from perfect indicator of actual time spent, it is surprising that the differences are so large. Dutch graduates spend an average of 50 months on the included activities, compared to less than 20 months in Spain, Italy and the UK. Closer inspection reveals that almost half the experiences of Dutch students involve non-study-related work. Relevant work experience is most common in Austria and Germany, and hardly occurs in Flanders and the UK. Swiss, Flemish and Dutch students spend the most time occupying voluntary positions, French and Dutch students spend most time on internships, and Austrian graduates spend the most time abroad. Figure 6.4 shows the same figures by level and type of higher education.

Second-level graduates acquire more of most forms of experience than first-level graduates. The exception is internships and work placements, on which the often more vocationally oriented first-level students spend more time. At both levels, health graduates spent a lot of time on the various forms of experience, particularly on study-related work experience and internships. Second-level humanities and

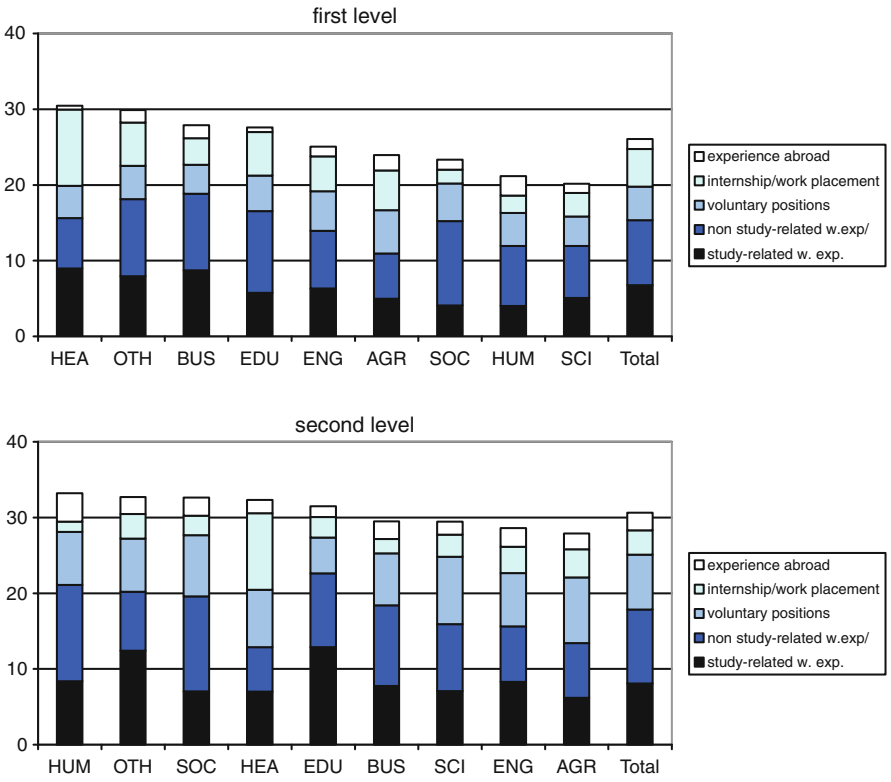

Fig. 6.4 Experiences during higher education, by field and level of education (months)

social sciences graduates also spend a lot of months on experience outside education, but a large proportion of this involves non-study-related work experience. Voluntary positions are particularly common among second-level graduates in almost all fields. Second-level Humanities graduates gain the most experience abroad.

6.2.3 Determinants of Study Behaviour

To some extent at least, the effort students expend on their study is likely to depend on their own innate personality. It is, however, conceivable that experiences gained in higher education can influence this, by exposing students to situations in which they feel more motivated. To examine this, OLS regression analyses were run with the three indicators presented in Section 6.2.1 as dependent variables, and personal background characteristics, programme characteristics and additional experiences as predictors.[3]

Table 6.1 shows the effects of personal background characteristics on the indicators of study behaviour. According to all three indicators, women clearly work harder in higher education than men. Older students worked less hours but did more often extra work than younger students, which may indicate a greater degree of efficiency or other benefit of their greater life experience. Interestingly, social background in terms of having at least one parent with a higher education degree has no effect at all on study hours, and a negative effect on the other two indicators. These negative effects seem at first sight counterintuitive, but may in fact reflect a lower degree of self-confidence among students who are so to speak treading new ground in their family. Such students may feel an extra need to prove that they belong in

Table 6.1 Relation between personal background characteristics and study behaviour (linear regression coefficients)[4]

	Did more work than needed to pass exams	Strive for highest possible grades	Study hours
Gender (female)	0.038	0.084	0.040
Age	0.054		–0.023
At least one parent has HE	–0.018	–0.023	
Had (pre)school-aged child during HE			

Only results presented that were significant at 1% level.

[3]It must be remarked at the outset that we cannot establish with any certainty the causal link involved. Nonetheless, in some cases it seems at least plausible that the feature in question promotes motivation and effort.

[4]The results presented in Tables 6.1, 6.2, 6.3 and 6.4 are based on the same three regression analyses, so all reported effects include controls for all other variables. All multivariate analyses in this chapter include controls for country, field and type of HE, gender, age and parents' education.

Table 6.2 Relation between programme characteristics and study behaviour (linear regression coefficients)

	Did more work than needed to pass exams	Strive for highest possible grades	Study hours
Second-level programme	0.059		0.038
Part-time programme	–0.083	–0.100	–0.277
Other programme characteristics:			
• *Generally regarded as demanding*	0.137	0.089	0.156
• *Employers familiar with content*			
• *Freedom to compose own programme*		0.026	–0.028
• *Broad focus*		0.019	
• *Vocational orientation*		0.028	
• *Academically prestigious*		0.028	

Only results presented that were significant at 1% level.

higher education, while for those whose parents have already been there it may seem more natural. Having (pre)school-aged children while in higher education has no effect at all on study behaviour as indicated by these three items.[5]

Table 6.2 shows the effect of various programme characteristics. Second-level students studied longer hours and did more often extra work than first-level graduates, but were no more or less inclined to strive for higher grades. Trivially, part-time students studied much shorter hours than full-time students. Less obvious is the finding that this is also reflected in the intrinsic and extrinsic motivation of students. Of the other programme characteristics, the degree to which a programme was regarded as demanding has the strongest effects. Again, in the case of study hours this is only to be expected. It is at least a little surprising that such programmes are positively related to the other two indicators. One might as well imagine that students of programmes that are especially demanding might have their hands full just getting through the required study material, and would find extra work and striving for higher grades a luxury that they can ill afford. The positive effect of demanding programmes may suggest that students who are challenged by a demanding programme rise to the challenge by working even harder than they need to get their degree. The remaining programme characteristics have only weak or non-significant effects, and in one case even a weak negative effect.

Table 6.3 shows the effect of various modes of teaching and learning on study behaviour. In most cases the effects are only rather weak. A somewhat stronger effect is seen for the extent to which the teacher as source of information was emphasized on the willingness to strive for higher grades. This feature has no effect at all on either study hours or intrinsic motivation, suggesting that strongly teacher-centred education may promote a more extrinsic study motivation. A strong emphasis on

[5]This holds for both mothers and fathers.

Table 6.3 Relation between modes of teaching and learning and study behaviour (linear regression coefficients)

	Did more work than needed to pass exams	Strive for highest possible grades	Study hours
Lectures	0.034	0.037	0.035
Group assignments			
Participation in research projects	0.028		
Work placements/internships			0.031
Facts & practical knowledge	0.028	0.029	0.028
Theories & paradigms			
Teacher as source of information		0.052	
Problem- or project-based learning	0.032		0.031
Written assignments	0.033	0.036	
Oral presentations	0.033	0.043	
Multiple choice exams			

Only results presented that were significant at 1% level.

Table 6.4 Relation between experiences during higher education and study behaviour (linear regression coefficients)

	Did more work than needed to pass exams	Strive for highest possible grades	Study hours
Study-related work experience	0.032	0.021	
Non-study-related work experience	–0.020	–0.037	
Voluntary positions		–0.026	
Work placements			0.034
Experience abroad			

Only results presented that were significant at 1% level.

lectures and on facts and practical knowledge has positive, although not very strong, effects on all three indicators.

Table 6.4 shows the effects of experiences gained during higher education. In general, only quite weak effects are observed. Particularly in the case of study hours this is surprising; one would expect time spent on one activity to be at the expense of another, so one would expect to observe negative relationships. This is not the case.[6] It seems that students find time for these other activities without this compromising the time they spend on studying. Study-related work experience has a positive effect on intrinsic and extrinsic study behaviour, but for non-study-related experience the opposite is true. Spending time in voluntary positions is related to a lower degree of striving for high marks. This may reflect a greater degree of self-confidence among graduates who have acquired such experience.

[6]Work placements (which are included in study hours) even have a positive effect on the overall hours of study.

6.3 Higher Education as Producer of "Mobilization" Competences

A key idea underlying this whole chapter is that graduates are not entirely at the mercy of the work situation they find themselves in for the mobilization of competences, but can actively strive to increase the level of mobilization even when the objective conditions are unfavourable. In the previous section we saw some indications for this in the different levels of effort students put into their study. We also saw indications that certain features of higher education may stimulate students to apply themselves more and to try to get more out of their higher education programme. It may be that such experiences actually foster the acquisition of competences that help graduates to make the most of their capacities regardless of the objective conditions in which they find themselves. If this is the case, higher education may have a role to play, by fostering such abilities. It is equally conceivable that higher education may play a role in fostering abilities that are useful for mobilizing the human resources of others.

As pointed out in Chapter 2, six competences were singled out in advance on theoretical grounds as likely to be important for graduates' ability to mobilize human resources. These are the ability to *work under pressure*, the ability to *use time efficiently*, the ability to *work productively with others*, the ability to *mobilize the capacities of others*, the ability to *make one's meaning clear to others* and the ability to *coordinate activities*. The first two competences are thought to be especially important for mobilizing one's own human resources, and the last four especially for mobilizing the human resources of others. We refer to these six competences in this chapter collectively as "mobilization competences".

In Chapter 2 a mixed picture emerged in terms of graduates' evaluation of their study programme in terms of mobilization competences. On one hand, around one in five graduates described the ability to work productively with others and the ability to perform well under pressure as a strong point of the study programme, and few saw these competences as weak points. In contrast, around one in six graduates regarded the ability to mobilize the capacities of others as a weak point of the study programme, with hardly any mentioning this competence as a strong point. The ability to use time efficiently was more in balance, although it was slightly more likely to be rated a strong point than a weak point. Relatively few graduates offered any opinion one way or the other about the study programme in terms of the remaining two mobilization competences, the ability to make one's meaning clear to others, and the ability to coordinate activities.

It is reasonable to assume that graduates evaluation of the study programme with respect to a given competence is related to the extent to which graduates have acquired the competence in question during higher education. While we don't have a measure of this in our data, we do know how highly graduates rate their own competences at the time of the survey. Figure 6.5 shows the percentage of graduates who report that the mobilization competences were weak or strong points, split into those who at the time of the survey report a low, medium or high level of the

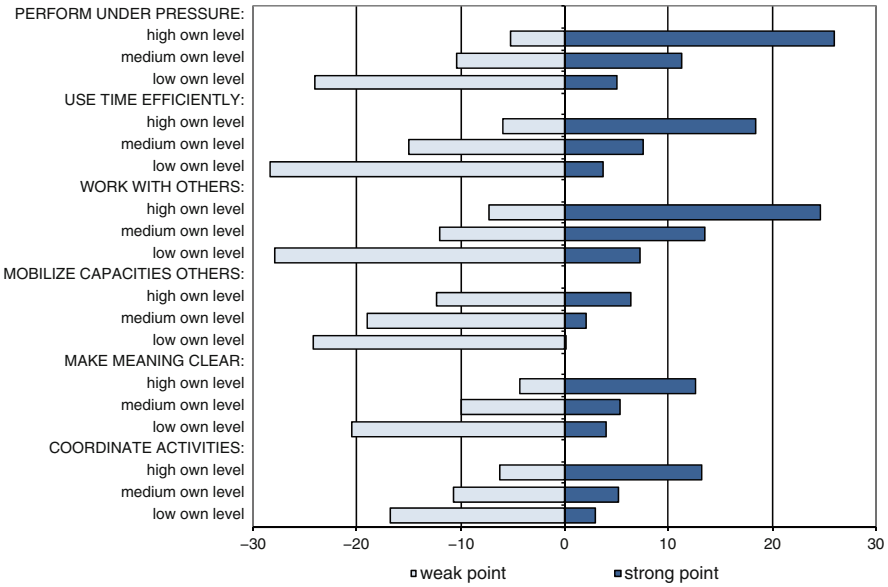

Fig. 6.5 Strong and weak points of mobilization competences, by own level

relevant competence (respectively those who answered 1–2, 3–5 and 6–7 on the 7-point scale ranging from 1 "very low" to 7 "very high").

As we might expect, the higher graduates rated their own level of competence, the more inclined they are to rate that competence as a strong point and the less likely they are to rate it as a weak point of their study programme. That said, it is far from a one-to-one relationship. Some graduates rated a competence as a weak point even though their own level was high, and some rated a competence on which their own reported level was low as a strong point of the programme. Particularly striking is the pattern for the ability to mobilize the capacities of others. Even graduates who reported that their own level was high were much more likely to rate this competence as a weak point than as a strong point of the programme. It may be that these graduates have acquired most of this competence at work. While we cannot test this supposition directly, we do have some indirect indications. Almost half of those graduates who rated their own level on this competence as high but regarded it as a weak point of their study programme are currently responsible for supervising others in their current work. This percentage is considerably higher than the 37% for the population as a whole (see Section 6.4.2), which may suggest that at least part of this competence has been developed at work.

The question arises what higher education can do about improving the level of graduates' competences in these areas. To gauge this, we conducted a series of multivariate analyses, in which the effect of various aspects of graduates' higher education experiences were used as predictors of the graduates' own level of the

Table 6.5 Effects of programme characteristics on the acquired level of competences relevant for mobilization (linear regression coefficients)

	Ability to:					
	Perform well under pressure	Use time efficiently	Work productively with others	Mobilize capacities of others	Make meaning clear to others	Coordinate activities
Second-level programme						
Other programme characteristics						
• Generally regarded as demanding	0.026	0.046	0.041	0.026	0.051	0.039
• Employers familiar with content	0.030					–0.021
• Freedom to compose own programme						
• Broad focus						
• Vocational orientation				0.027		0.028
• Academically prestigious	0.028	0.031				

Only results presented that were significant at 1% level.

mobilization competences. We focus hereby on some key characteristics of higher education programmes, the main modes of teaching and learning applied, the experiences acquired during higher education, the results achieved at the end of the programme, and the behaviour of students during the programme as independent variables. Tables 6.5, 6.6, 6.7 and 6.8 show the relevant results.

Before going into a discussion of the results in detail, we can make some remarks about the results in general. First of all, it appears that higher education can make a difference in terms of generating mobilization competences. Many of the characteristics and experiences of higher education have a statistically significant effect on the acquired level of these competences. Secondly, it should be remarked that the individual effects, even when statistically significant, are not very large. To give some kind of perspective on what the effects mean, a graduate who reported that his or her study programme is regarded as demanding to a very high degree scores on average a quarter of a point higher (on a 7-point scale) on the ability to make your meaning clear than a graduate who reported that the programme was not at all demanding. It should be stressed that this was one of the strongest effects observed; most of the other effects were not as strong. Thirdly, the cumulative effect of these characteristics is also not very large. Only a small fraction of the total variance in these competences is explained by these variables. Even taking into account the fact that our indicators almost certainly do not cover the full range of variation in educational experiences that might help shape competences, this is disappointing. In

Table 6.6 Effects of modes of teaching and learning on the acquired level of competences relevant for mobilization (linear regression coefficients)

	Ability to:					
	Perform well under pressure	Use time efficiently	Work productively with others	Mobilize capacities of others	Make meaning clear to others	Coordinate activities
Lectures						
Group assignments		0.031	0.044			0.030
Participation in research projects						
Work placements/ internships						
Facts & practical knowledge		0.030	0.036		0.032	0.024
Theories & paradigms	0.021		0.030	0.031	0.030	
Teacher as source of information						
Problem- or project-based learning						
Written assignments						0.026
Oral presentations	0.037		0.034		0.052	0.027
Multiple choice exams						

Only results presented that were significant at 1% level.

Table 6.7 Effects of experiences during higher education on the acquired level of competences relevant for mobilization (linear regression coefficients)

	Ability to:					
	Perform well under pressure	Use time efficiently	Work productively with others	Mobilize capacities of others	Make meaning clear to others	Coordinate activities
Study-related work experience	0.025			0.029		0.037
Non-study-related work experience				0.023		
Voluntary positions			0.022	0.041	0.032	0.049
Work placements						
Experience abroad						

Only results presented that were significant at 1% level.

sum, we can say that not only is there no individual "magic bullet" that on its own guarantees success, even cumulatively the contribution that higher education can make is quite modest.

Turning now to the effects of the various indicators, Table 6.5 shows that the programme characteristic that makes the biggest difference in most cases is whether or

Table 6.8 Effects of level of study behaviour on the acquired level of competences relevant for mobilization (linear regression coefficients)

	Ability to:					
	Perform well under pressure	Use time efficiently	Work productively with others	Mobilize capacities of others	Make meaning clear to others	Coordinate activities
Study behaviour						
• *Average study hours*			0.024			
• *Strived for higher grades*		0.040				
• *Did more work than needed to pass exams*	–0.031					

Only results presented that were significant at 1% level.

not the programme was demanding. This is not very surprising, one would expect students of demanding programmes to learn more competences *in general* than graduates of less demanding programmes. Vocationally oriented programmes are good at producing those competences that are thought to be relevant for mobilizing the human resources of others, while academically prestigious programmes are good at producing competences relevant to mobilizing one's own human resources. Programmes that are familiar to employers seem to produce somewhat higher levels of ability to perform under pressure, but lower levels of ability to coordinate activities. Freedom to choose and the breadth of focus do not have any significant effects on mobilization competences. First- and second-level programmes also do not generate significantly different levels of mobilization competences.

Table 6.6 shows effects of various modes of teaching and learning on the level of mobilization competences. Student-centred aspects like group assignments and oral presentations have quite strong effects on several mobilization competences. Although these are often features of project- and/or problem-based learning, this mode of teaching and learning has hardly any effect after controlling for these aspects. Interestingly, facts and practical knowledge and theories and paradigms also have rather strong effects. This suggests that, in addition to methods in which students play an active role, a strong emphasis on theoretical and practical knowledge helps generate competences that are important for mobilizing human resources. We can only speculate about the mechanism involved here, but it is conceivable that the possession of a good knowledge base makes it easier for graduates to make the most out their own and others' human resources.

Table 6.7 shows the effects of various forms of experience gained during higher education. As we might expect, study-related work experience has an effect on the development of several of the mobilization competences. The effects are not very strong, however. The strongest effects, however, are those of positions held in voluntary organizations during higher education, especially on the competences thought

to be relevant for mobilizing the human resources of others. Non-study-related work experience, work placements and time spent abroad have little or no effect.

Table 6.8 shows the effects of level of study behaviour on the level of the six mobilization competences. In general, study behaviour showed surprisingly little effect on the development of mobilization competences. This is doubly surprising, since one would expect a high degree of motivation to work hard and achieve good results to not only to be good for developing competences in general, but in a sense to be a component of the very competences we are looking at here. After all, one might assume that a high degree of motivation is a prerequisite for mobilizing human resources. The only positive exception is a rather strong effect of a willingness to strive for higher grades on the ability to use time efficiently. The only other effect of note is a negative effect of willingness to do more work than needed to pass exams on the ability to perform under pressure. It is unclear what mechanism is involved here, but it may be a case of reverse causality, whereby students who cannot handle pressure well tend to over-prepare for their exams.

6.4 Mobilization of Human Resources After Higher Education

In this section we will try to put a further piece of the puzzle into place by describing some indicators that may be regarded as relevant to the mobilization by graduates of their own resources. We start by briefly describing the extent to which graduates mobilize their own human resources: are they actively engaged in the labour force, if so for how many hours and at what level, to what extent do they utilize their capacities in the hours when they are at work and what other activities are they engaged in. In this section we try to provide an impression of this dimension of mobilization. We then present some indicators of the extent to which graduates are involved in mobilizing the human resources of others: are they directly responsible for supervising or monitoring the performance of other staff members, and do they have real strategic decision-making authority at the level of the organization?

6.4.1 Mobilizing One's Own Capacities

Labour Force Participation and Education-Job Match

Chapter 8 reports extensively on labour force participation and the education-job match, so we will not dwell long on this here. It is sufficient to mention a number of the most striking results. The authors show that around three-quarters of first-level graduates and a slightly lower proportion of second-level graduates are currently employed in jobs that match their own level and field of education. The remaining graduates are either unemployed or are employed in jobs for which their own level and/or field of education is not considered appropriate. The authors refer to these graduates collectively as "mismatched". British and Spanish graduates have relatively high shares of mismatches, while relatively few Finnish and Norwegian

graduates samples are mismatched. Czech and British first-level graduates are quite often employed in jobs that do not match their own field of education, while Spanish graduates are more often employed or working in jobs that match neither their own level nor their own field. This shows that the Spanish sample more often than the other samples experience the most severe forms of mismatch. Graduates in the Humanities are most likely to be mismatched both in terms of being unemployed and in terms of having employment at an appropriate level and in an appropriate field. Health and Welfare graduates are least likely to experience such mismatches.

Working Hours

Mobilizing one's own resources is not only a matter of having appropriate employment. Graduates can only mobilize their own capacities in the hours that they actually work, and many graduates work less than a full-time week. Figure 6.6 shows the percentage of graduates who work part-time.[7]

About 13% of all graduates work part-time. In general, the highest proportion of part-time work is seen in those countries with a high level of unemployment. The major exception to this rule is the Netherlands, where part-time work is known to be particularly popular as a form of work-sharing between young parents, and where the unemployment level is low. Most of these Dutch graduates work in "longer" part-time jobs, with working hours between 20 and 32 h per week. In countries such as Italy and Spain, where the unemployment level is relatively high and a higher proportion of graduates work less than 20 h per week, it seems more likely that part-time work is more often involuntary, being the only work that graduates have been able to obtain.

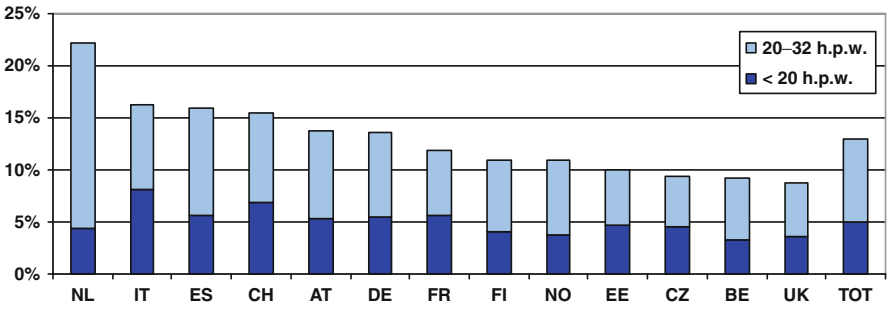

Fig. 6.6 Percentage of graduates working part-time, by country (% of graduates in paid employment)

[7]Since there is no international standard definition of full-time work, any cut-off point we choose will be somewhat arbitrary. We adopt a conservative definition of full-time work. Based on the assumption that a standard working day is no more than eight hours, anybody working 33 h or more per week will be working for more than the equivalent of four standard days. We define this for our purposes as a full-time working week.

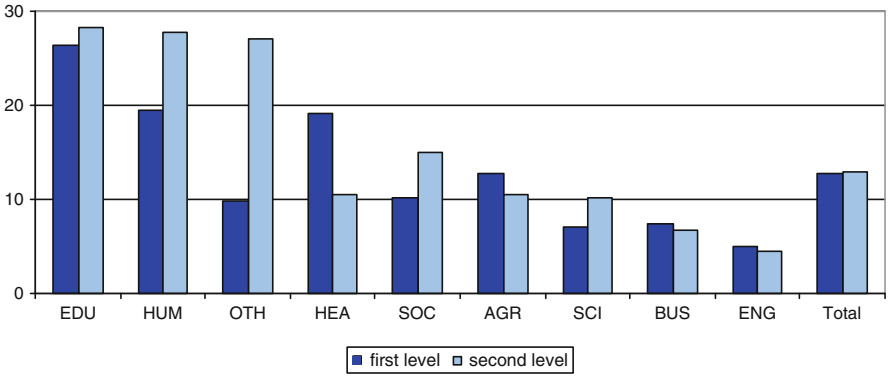

Fig. 6.7 Percentage of graduates working part-time, by field and level of education (%)

There is little difference between first- and second-level programmes in terms of part-time work (see Fig. 6.7). There are, however, pronounced differences between fields of study. Arts & Humanities and Education graduates are more likely to work shorter hours than graduates in other fields. By contrast, only a small proportion (less than 5%) of all graduates at both levels in Engineering, Manufacturing and Construction work part-time.

Utilization of Knowledge and Skills

Although we have established that a large proportion of graduates work for long hours in jobs matching their education, this provides no guarantee that graduates' capacities are sufficiently utilized. It is often assumed that overeducation implies underutilization. However, in recent years, there has been an increasing awareness that, although overeducation is likely to be related to underutilization, the two are in fact quite distinct (see e.g. Allen & van der Velden, 2001). By no means all overeducated workers fail to utilize their capacities and, conversely, some adequately educated workers are less than satisfied about the extent to which their knowledge and skills are utilized in their work. Such discrepancies may be due to the fact that graduates are in fact more or less able than their level of education suggests or, alternatively, to the fact that the requirements of the job in terms of knowledge of skills is different from what one would expect from the formal level of education required. Since it is actual mobilization of graduates' own capacities we are interested in, we need a more direct indicator than overeducation. Figure 6.8 shows the proportion of graduates per country who report that they utilize their capacities to a high or very high extent.[8]

[8] Answer 4 or 5 on a 5-point scale ranging from 1 (not at all) to 5 (to a very high extent) to the question "To what extent are your knowledge and skills utilized in your current work?"

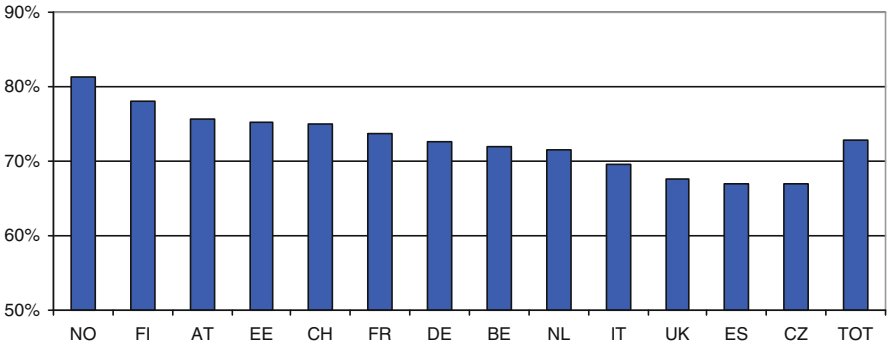

Fig. 6.8 Utilization of knowledge and skills, by country (%)

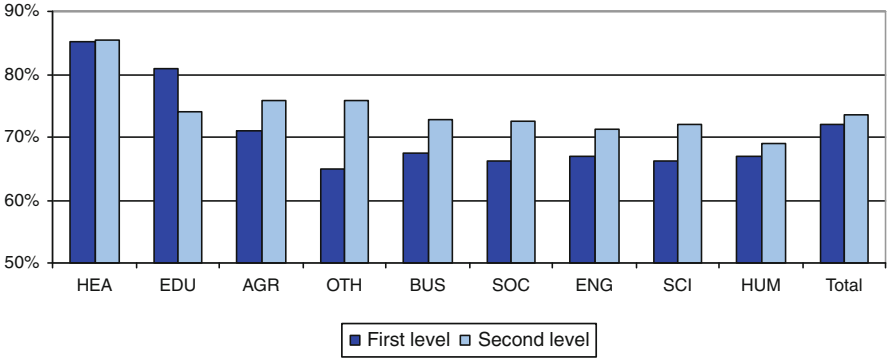

Fig. 6.9 Utilization of knowledge and skills, by field and level of education (%)

In general, as one would expect, there is quite a strong correspondence between the degree of overeducation and the degree of skill utilization in a country. The countries that are shown in Chapter 8 to have high levels of mismatches are generally speaking the countries with the lowest levels of skill utilization and vice versa. First-level programmes show slightly lower levels of skill utilization than second-level programmes (see Fig. 6.9). Again mirroring the results in Chapter 8, Arts & Humanities graduates show a relatively low degree of utilization, and Health & Welfare graduates a high degree.

These results suggest that overeducation is indeed related to skill utilization. In order to confirm that this also applies at the individual level, Fig. 6.10 shows the percentage of graduates that report high levels of utilization, by categories of education-job match and country.

Figure 6.10 indeed confirms the expected relation. In every country, the highest percentage of skill utilization is seen among graduates working at the same or a higher level, decreases somewhat for graduates working at a lower level of tertiary education, and is lower still for graduates working below tertiary level. At each level we also observe a strong relation with the horizontal match: graduates working in

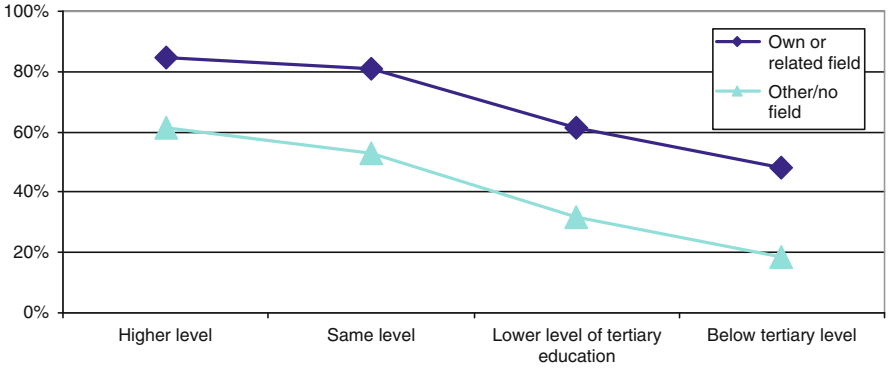

Fig. 6.10 Utilization of knowledge and skills, by education-job match and country (%)

jobs for which their own or a related field is most appropriate report much higher levels of skill utilization than those working in jobs for which another field or no particular field would have been more appropriate. Although the expected relation between education-job match on one hand and skill utilization on the other is confirmed, there are a number of points that are worthy of note. Firstly, although the utilization level is high for graduates working in jobs for which at least their own level and their own field are most appropriate, it is well below 100%. One might be inclined to dismiss this as random noise, but additional analyses confirm that the level of skill utilization within this group is clearly associated with higher values on outcome variables like job satisfaction and income. More striking is the fact that about one in five graduates working below tertiary level and outside their own field nonetheless report a high degree of skill utilization. This result is once again validated by a strong relation with outcome variables. Although finding employment that matches one's own level and/or field of education obviously increases one's chances of utilizing one's own knowledge and skills capacities, many overeducated graduates nonetheless manage to mobilize their own human resources in this respect. Given this variation in skill utilization within categories of education-job match (over which higher education and graduates will have little if any direct control), it is of interest to identify factors that have an impact on it. We will return to this point later in the chapter.

Other Activities

Although the focus of this chapter is mainly on mobilization of human resources within the world of work, it is important not to lose sight of the fact that graduates can also put their capacities to use in other areas. Figure 6.11 shows the degree of participation in the four weeks preceding the survey in activities other than paid work.

Given the fact that the survey was conducted around five years after graduation, a surprisingly large proportion (about a third) of all graduates are involved in

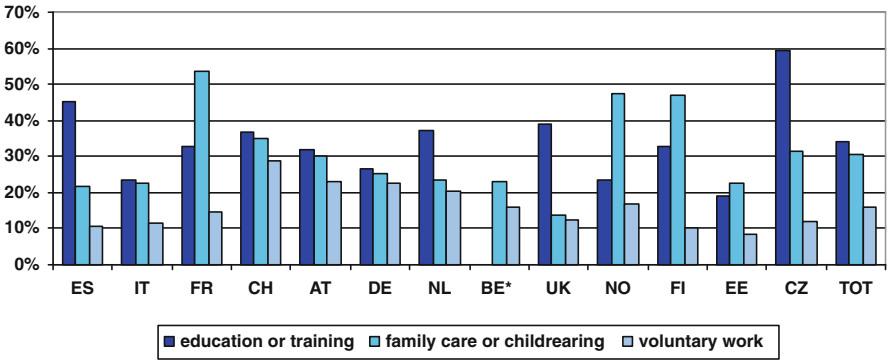

Fig. 6.11 Participation in past four weeks in activities other than work, by country (%). Education/training not asked in Belgium-Flanders.

some kind of education or training. There are pronounced differences between countries, with around 60% of Czech graduates engaged in further learning, compared to around one in five in Estonia and less than a quarter in Italy and Norway. A slightly lower proportion of graduates were involved in family care, ranging from more than half in France, to less than 15% in the UK. The proportion of graduates doing some kind of voluntary work is lower than that engaged in the other two classes of activity, but at around 17% is still substantial. Almost 30% of Swiss graduates do voluntary work, and even in the country with the lowest percentage (Estonia) more than 8% are engaged in this type of work.

Additional analyses (not shown here in detail) reveal that participation in training is hardly related to labour force status. It is highest among part-time workers, suggesting a kind of dual status incorporating study and work, and lowest among those not in active employment, indicating that training and paid work are not generally speaking substitutes for each other may even be to some extent complementary. In contrast, there are clear indications that family care and voluntary work are substitutes for paid employment. Family care is very common among those not in the labour force and relatively rare among full-time workers (although more than a quarter of full-time working graduates still take on some caring duties). Unsurprisingly, full-time workers participate less in voluntary work than graduates working less hours or not at all.

6.4.2 Mobilizing Capacities of Others

We have established that most graduates are fairly successful at mobilizing their own capacities. Ideally, we would like to find out whether the same applies to mobilizing capacities of others. In the case of one's own capacities, we had a very direct indicator of the degree to which these are actually utilized at work. In the case of mobilization of the capacities of others, things are less straightforward. On one

hand, we have quite a lot of indicators of the formal role graduates play in the organizations in which they work. We know whether graduates are responsible for supervision and/or quality control with respect to the work of others, and the extent to which graduates bear strategic decision-making authority in their organization. In other words, we know *whether* graduates are involved in mobilizing the capacities of others. However, the impact of these things on the actual performance of other workers – the direct measure of this kind of mobilization – takes place "offstage" as it were. Although we can probably assume that, in general, employers assign such responsibilities to people who they feel are best suited to them, we need to keep in mind that we may be missing variance in *how well* graduates are fulfilling these duties.

Formal Responsibility for Other Staff Members

The simplest indicator of the role played in mobilizing others, and the one most commonly encountered in labour market research, is whether or not a person is responsible for supervising others. Although this indicator is far from useless, it clearly has its limitations. The label "supervisor" is used to describe a multitude of roles, ranging from a simple "first among equals" role in a team-working situation to positions of great authority and responsibility. Nor does additional information help us much, since genuine authority figures in many organizations may only have one or two other key figures working under them, while lower level managers on the workfloor may "supervise" the work of tens or even hundreds of unskilled workers. A key question is that of control over the quality of performance of others. Figure 6.12 therefore supplements information on the proportion of graduates who supervise others with data on the proportion of graduates who report a high degree of responsibility for assessing the work of others.

It is clear from Fig. 6.12 that only a minority of graduates are responsible for mobilizing others, even based on these rather minimalist indicators. About a third of

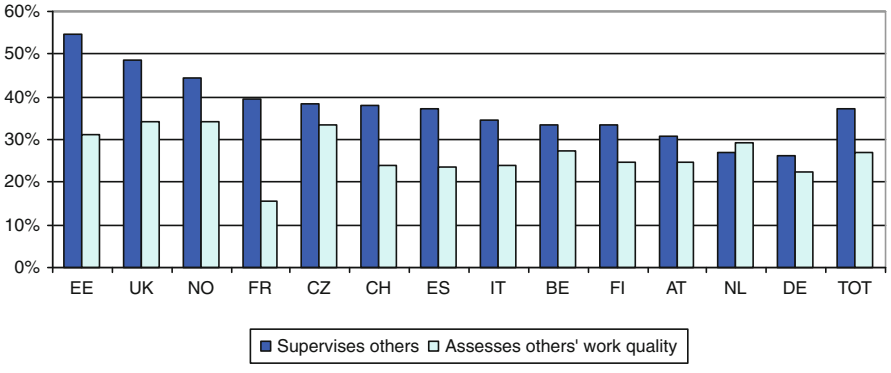

Fig. 6.12 Responsibility for other staff members, by country (%)

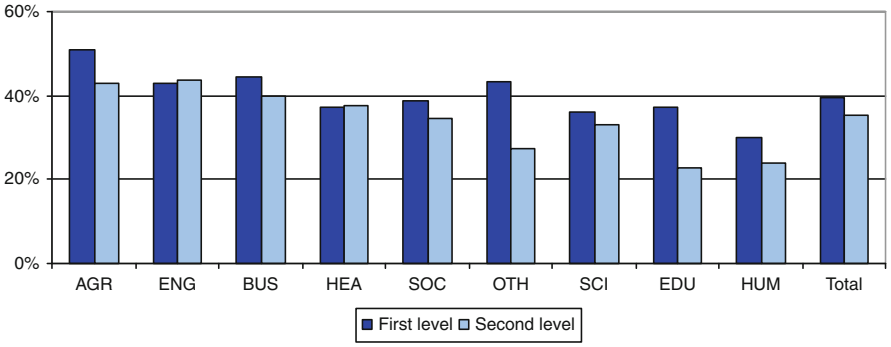

Fig. 6.13 Percentage of graduates who supervise others, by field and level of education (%)

graduates supervise other workers, and only a quarter are responsible for assessing the work of others. This suggests that supervision may indeed often be a rather perfunctory task without much substance. Nonetheless, at the aggregate level of countries, there is a clear relation between the two. Estonian and UK graduates bear supervisory responsibility most often, and UK graduates are also most often responsible for assessing others' work. In contrast, German graduates score rather low on both indicators. The main exception to the general pattern is formed by French graduates, who rarely assess the quality of others, but quite often supervise.

A little unexpectedly, first-level graduates are slightly more likely to supervise others than their more highly qualified second-level graduates (see Fig. 6.13).[9] This difference is probably attributable to the fact that second-level graduates are much more likely to work as autonomous professionals than their first-level peers. Engineering and Agriculture graduates often have such responsibilities. Education and Arts & Humanities graduates are less likely to do so.

Strategic Decision-Making Authority

Regardless of whether they actually work with others, graduates who play a strong role in setting goals and/or deciding strategies for their organization will thereby also influence the mobilization of their co-workers. Although we have indicators of the role of graduates in both setting goals and deciding strategies for their organization, these are highly correlated. To avoid unnecessary repetitions, Fig. 6.14 shows the percentage of graduates who report that at least one of these two descriptions applies to them to a high or very high extent. Because the meaning of these questions depends on organization size (it is easier to bear responsibility for a small than a large organization) a breakdown by size is presented. To allow easier comparison

[9]To avoid cluttering things, the percentage of graduates who assess others' work quality is not shown. The overall pattern for this indicators is similar to that for supervision.

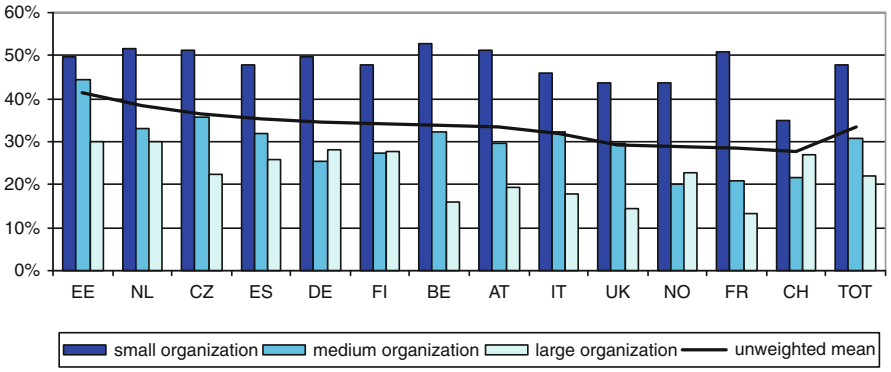

Fig. 6.14 Strategic decision-making authority, by country and organization size (%)

between countries, an unweighted mean of the percentages in small, medium and large organizations is superimposed on the graph.

As expected, the proportion of graduates who bear responsibility for the organization is strongly dependent on organization size. Almost half those working in small organizations (1–49 employees) bear such responsibility; only about 1/5 of those working in large organizations (≥250 employees) do so. Although this pattern is largely reproduced in all countries, there are some differences in the absolute level per country. French, Swiss, British and Norwegian graduates are relatively unlikely to bear strategic decision-making authority for their organization. Estonian and Dutch graduates are most likely to bear such responsibility. There is little difference between first- and second-level graduates (see Fig. 6.15). Education and Agriculture & Veterinary graduates often bear such responsibility, and Science, Mathematics & Computing graduates are relatively unlikely to bear such responsibilities.

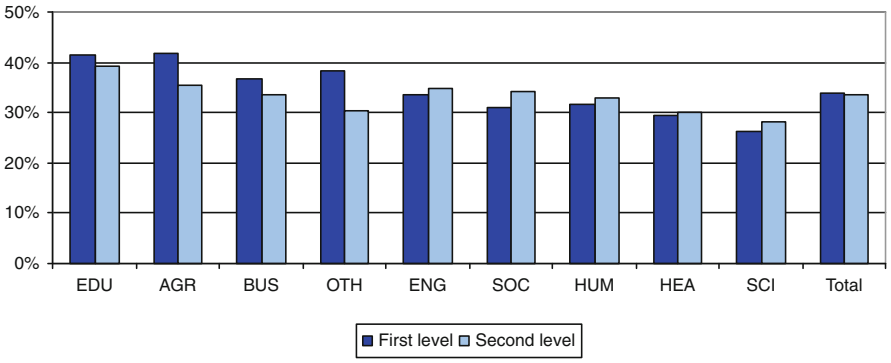

Fig. 6.15 Strategic decision-making authority (Unweighted mean of percentage in small, medium and large organizations), by field and level of education (%)

6.5 Determinants of Utilization of Own Capacities

Having established, in Section 6.3, that higher education has only a modest capacity to influence the level of mobilization competences, we may wonder whether it can realistically make a contribution to increasing the actual level of mobilization. We do this by way of a series of multivariate regression analyses. In this section we look at determinants of utilization of own capacities. Of course a key point hereby is to establish whether the competences relevant to mobilizing human resources have the expected effects. It is important to remark at this point that although we have earmarked the abovementioned six abilities as mobilization competences on theoretical grounds, we cannot be certain in advance that these are the only, or indeed even the most important, competences that play a role in mobilizing human resources. For this reason, we also include clusters of the competences representing professional expertise, functional flexibility and innovation and knowledge management. In addition, because we cannot be sure that all of the effects of higher education occur through competences, we include the same set of higher education characteristics and characteristics as were included above as predictors of competences. Such characteristics may influence utilization directly, by making graduates better at getting the most out of themselves in difficult situations, but also indirectly, by improving graduates' chances of being selected for jobs that are well matched to their abilities. In addition to competences and higher education characteristics and experiences, we also include some indicators of experiences gained outside higher education and some characteristics of the organizations in which graduates currently work that may have an effect on their ability to mobilize their own human resources. The results are shown in Tables 6.9, 6.10, 6.11, 6.12, 6.13, 6.14 and 6.15.[10]

Looking first to the results as a whole, we can say that a limited number of predictors have very strong effects, while most predictors have little or no effect. All in all, the model explains about one eighth of the total variance in utilization. Encouragingly, a large part of this is accounted for by competences and higher education characteristics and experiences. This suggests that, although higher education only explains a relatively small proportion of mobilization competences, it has a meaningful effect on the actual utilization of one's own capacities. Nonetheless, it is clear that utilization is influenced more by factors outside our model than by the indicators we have included. A large part of this is of course the match between one's own education and that regarded as appropriate for the job. This has not been included here because it is conceptually so closely intertwined with utilization, which would mask a lot of the effects of our predictors. More interesting, especially in the case of the effects of higher education characteristics, is the pattern of effects within categories of mismatch. If education has a role to play, this may be mainly in those unfortunate but inevitable situations where graduates find themselves in

[10]Because the analyses are conducted for separate sub-groups, some of which are much smaller than others, we include results that are significant only at the 5% level as well as results that are significant at 1% level.

employment not matching their education. Especially then graduates are likely to benefit from having competences that help them get more out of themselves. For this reason, the effects of competences and higher education characteristics and experiences are shown separately for different categories of mismatch.

Turning to the effects of individual predictors, Table 6.9 shows the effects of different kinds of competences.

The results shown in Table 6.9 are surprising in several respects. First of all, the competences that were thought to be important for mobilizing one's own resources – the ability to perform well under pressure and the ability to use time efficiently – have relatively little effect. The ability to perform under pressure does help somewhat in jobs matching the graduates own field, but the ability to use time efficiently has no positive effect at all and even a strong negative effect in jobs that match neither the graduates' level nor their field. We might speculate that in such jobs, which presumably place few demands on graduates' specialized abilities, being able to organize one's time efficiently may only exacerbate the problem.

At least as surprising as the relative absence of effects of the competences that were expected to be especially relevant is the strong effect of the cluster professional expertise. Even more remarkable is the finding that the effect is strongest among graduates working in jobs for which their own or a higher level but a different field is regarded as most appropriate. It would seem that possessing a high level of professional expertise enables graduates to better utilize their capacities in

Table 6.9 Utilization of capacities, by own level of competences (regression coefficients)

	Own level and field	Own level, other field	Lower level, own field	Lower level, other field	All employees
Mobilization competences:					
• *Ability to perform well under pressure*	**0.031**		0.058		**0.043**
• *Ability to use time efficiently*				**–0.098**	
• *Ability to work productively with others*	**0.026**				
• *Ability to mobilize the capacities of others*					
• *Ability to make your meaning clear*	**0.035**		0.068		**0.031**
• *Ability to coordinate activities*	–0.023			**0.100**	
Clusters of other competences:					
• *Professional expertise*	**0.099**	**0.202**			**0.120**
• *Functional flexibility*	**–0.036**		–0.063		**–0.065**
• *Innovation and knowledge management*	**0.050**				**0.060**

Only results presented that were significant at least at 5% level.
Coefficients in bold significant at 1% level.

general, even (or especially) when their work doesn't match their field of training. Competences related to innovation and knowledge management also improve mobilization, although not when the job doesn't match one's education. The quite strong negative effects of functional flexibility could be a case of reversed causality: graduates who are not in a position to do what they are good at may need to become more flexible.

Table 6.10 show the effects of several programme characteristics.

Higher education characteristics have some residual effects on utilization after controlling for competences. Graduates of second-level programmes are more successful in utilizing their knowledge and skills than graduates of first-level programmes, although this only holds in jobs that match the graduates' own level. The familiarity of employers with the content of the programme has quite strong effects, as does vocational orientation and to a lesser extent academic prestige. It may be that these effects work more indirectly, by increasing the chance that graduates find their way to employers who know what they are capable of, than directly, by enhancing graduates' abilities to get the most out of themselves. This is consistent with the finding that the effects of these characteristics are largely confined to graduates working in jobs matching their own field. Having graduated from a demanding programme has no significant overall effect on utilization after controlling for competences (on which, as we saw, it has a rather strong effect).

Modes of teaching and learning have few residual effects after controlling for competences (see Table 6.11). The effect of work placements may, like vocational orientation and familiarity of employers with the content of the study programme, be indirect, increasing the chances that graduates are employed by organizations that are geared to their specific knowledge and skills. Such an effect is, however, not plausible for lectures, which also show a positive effect. It is not clear what mechanism underlies this effect.

Table 6.10 Utilization of capacities, by programme characteristics (regression coefficients)

	Own level and field	Own level, other field	Lower level, own field	Lower level, other field	All employees
Second level programme	**0.033**	**0.094**			**0.043**
Other programme characteristics					
• *Generally regarded as demanding*	0.020				
• *Employers familiar with content*	**0.062**		**0.069**	0.073	**0.089**
• *Freedom to compose own programme*					
• *Broad focus*					
• *Vocational orientation*	**0.063**		**0.093**		**0.075**
• *Academically prestigious*	**0.030**				**0.038**

Only results presented that were significant at least at 5% level.
Coefficients in bold significant at 1% level.

Table 6.11 Utilization of capacities, by modes of teaching and learning (regression coefficients)

	Own level and field	Own level, other field	Lower level, own field	Lower level, other field	All employees
Lectures	**0.043**				**0.033**
Group assignments					
Participation in research projects					
Work placements/internships		0.097			**0.029**
Facts & practical knowledge	**0.038**			–0.073	
Theories & paradigms					
Teacher as source of information					
Problem- or project-based learning		0.071			
Written assignments					
Oral presentations				**0.101**	
Multiple choice exams					

Only results presented that were significant at least at 5% level.
Coefficients in bold significant at 1% level.

As Table 6.12 shows, experiences either before, during or after higher education have little effect on utilization. Only study-related work experience during higher education has a significant positive effect. Interestingly, work experience since graduation has no significant effect. The so-called waiting-room hypothesis (see e.g. Asselberghs, Batenburg, Huijgen & de Witte, 1998) predicts that work experience

Table 6.12 Utilization of capacities, by experiences before, during and since higher education (regression coefficients)

	Own level and field	Own level, other field	Lower level, own field	Lower level, other field	All employees
Experiences before he:					
• *Study-related work experience*					
• *Non study-related work experience*					
Experiences during he:					
• *Study-related work experience*	**0.039**		–0.053		**0.039**
• *Non study-related work experience*					
• *Voluntary positions*					
• *Work placements*					
• *Experience abroad*					
Experiences after he:					
• *Work experience*		–0.058			
• *Initial search duration*	–0.020		**–0.075**		**–0.030**

Only results presented that were significant at least at 5% level.
Coefficients in bold significant at 1% level.

will improve the education–job match over time, and that initial overeducation is largely a temporary situation that is alleviated over time, as adjustments are made by changing jobs. Although this hypothesis refers to overeducation, we might expect the hypothesis to transfer more or less directly to utilization, with the additional possibility that adjustments could be made within as well as between jobs. Following this line of reasoning, we would expect a strong positive effect, so the absence of an effect is a little surprising. The only other significant effect in Table 6.12 is that of initial search duration, which decreases the level of utilization.

As Table 6.13 shows, study achievements, in the form of grades, has a significant, but not very large effect on utilization. Study motivation, indicated by the extent to which graduates were prepared to do more work than needed to pass exams and/or to strive for the highest possible grades, has no overall significant effect on later utilization, although a very weak effect is seen for graduates working in jobs matching their own level and field of education. Social capital, in the form of a good social network, has a strong positive effect on utilization – also in non-matching jobs – but cultural capital, in the form of having at least one highly educated parent, only seems to improve utilization of one's knowledge and skills very slightly. Both these effects may be due to an increased chance of finding employment in which one can utilize more of one's capacities rather than through an increased ability to get more out of oneself. However, we should remark that the measure of social capital, like the dependent variable, refers to the situation as it was when graduates completed the questionnaire. In contrast to the other predictors described so far, which refer to the situation during or even before higher education, we cannot plausibly claim that this relation is causal, only that graduates who have a good social network utilize

Table 6.13 Utilization of capacities, by study achievement and motivation, cultural and social capital and parental role (regression coefficients)

	Own level and field	Own level, other field	Lower level, own field	Lower level, other field	All employees
Study achievement and motivation:					
• *Relative grade*	0.022				**0.037**
• *Did more work than needed to pass exams*	0.020				
• *Strived for higher grades*	**0.027**				
Cultural and social capital:					
• *Quality of social network*	**0.077**	**0.073**	**0.063**	**0.124**	**0.090**
• *At least one parent has HE*					**0.021**
Parent of young child (<5 yrs):					
• *Father*					
• *Mother*	**–0.039**				**–0.033**

Only results presented that were significant at least at 5% level.
Coefficients in bold significant at 1% level.

their capacities more on average than graduates with a less useful network. Having at least one child under five years has a small but significant negative effect, however only for women.

Table 6.14 shows the effects of various characteristics of the organization in which graduates work and the market in which the organization operates. Like social network, the situation described by these variables is concurrent with that for the dependent variable, so the effects should be regarded as descriptive rather than causal. As such, there is little point in considering the results separately for different categories of education-job match. We suffice with the results for all employed graduates.

As one might expect, the self-employed are better able to utilize their own capacities than those who work for others. Working in the public or non-profit sector has an even stronger positive effect. There is little evidence that working in larger organizations, and/or in organizations with a national or international scope, allows graduates any more or less opportunities to utilize their capacities than they have in smaller and/or more locally oriented organizations. Of the market characteristics, competition based on quality (as opposed to price) has a small positive effect on utilization. Instability in demand is associated with lower levels of utilization. Organizational change in the form of reorganizations and/or large scale layoffs has a negative effect on utilization, although this is not very large. Graduates working

Table 6.14 Utilization of capacities, by organization and market characteristics (regression coefficients)

Self-employed	0.060
Public/non-profit sector	0.122
Scope of operations (ref.: local):	
• *Regional*	
• *National*	
• *International*	
Size of organization (ref.: <10 employees):	
• *10–49*	
• *50–99*	
• *100–249*	–0.021
• *250–999*	
• *1,000 or more*	
Market characteristics:	
• *Strong competition*	
• *Competition based on quality*	0.030
• *Unstable demand*	–0.020
Changes in organization:	
• *Work tasks*	
• *Reorganization*	–0.033
• *Large-scale layoffs*	–0.038
Organization at the forefront of innovation	0.073
Extent to which performance is monitored	

Only results presented that were significant at 1% level.

in organizations that are more at the forefront when it comes to introducing innovations have more opportunities to utilize their knowledge and skills than graduates who work in organizations that tend to follow rather than set the trend. There is no significant effect of monitoring of performance, suggesting that, in general, graduates neither abuse the greater degree of freedom, nor make use of it to put their capacities to better use.

6.6 Determinants of Mobilization of Others' Capacities

As mentioned above in Section 6.4.2, in the case of mobilization of the capacities of others, we only have indicators of *whether* graduates are involved in mobilizing the capacities of others, and not of *how well* they are doing so. This means that any observed effects of educational and background characteristics work through increasing or decreasing the chance that employers assign such responsibilities to graduates, and not necessarily through making graduates better or worse at actually fulfilling such roles. Since we assume that employers will be more inclined to assign such responsibilities to people who they feel are best suited to them, educational and background characteristics may act as signals (or help to promote other characteristics that in turn are seen as signals) of suitability.

In this section, the results of three multivariate analyses will be presented. The dependent variables are supervision (logistic regression analysis of chance that one is a supervisor), assessing quality of others (OLS regression analysis of the extent to which one is responsible for this) and strategic decision-making authority (OLS regression analysis of the mean of the two underlying variables). Most of the same independent variables are included as in the analysis of utilization. Tables 6.15, 6.16, 6.17, 6.18, 6.19 and 6.20 show the results of these analyses.

Table 6.15 Mobilization of capacities of others, by own level of competences (regression coefficients)

	Supervise others	Quality control	Strategic decision-making authority
Mobilization competences:			
• *Ability to perform well under pressure*	0.133	0.055	0.025
• *Ability to use time efficiently*	–0.066	–0.050	–0.054
• *Ability to work productively with others*	–0.107		–0.047
• *Ability to mobilize the capacities of others*	0.228	0.139	0.094
• *Ability to make your meaning clear*		–0.023	
• *Ability to coordinate activities*	0.198	0.079	0.078
Clusters of other competences:			
• *Professional expertise*	0.187	0.058	0.049
• *Functional flexibility*		0.026	0.081
• *Innovation and knowledge management*			0.029

Only results presented that were significant at 1% level.

Table 6.16 Mobilization of capacities of others, by programme characteristics (regression coefficients)

	Supervise others	Quality control	Strategic decision-making authority
Second-level programme	0.153		
Other programme characteristics			
• *Generally regarded as demanding*			
• *Employers familiar with content*			
• *Freedom to compose own programme*	–0.077		
• *Broad focus*			
• *Vocational orientation*			
• *Academically prestigious*			

Only results presented that were significant at 1% level.

Table 6.17 Mobilization of capacities of others, by modes of teaching and learning (regression coefficients)

	Supervise others	Quality control	Strategic decision-making authority
Lectures			
Group assignments			
Participation in research projects		0.021	0.041
Work placements/internships			
Facts & practical knowledge			
Theories & paradigms			0.019
Teacher as source of information			
Problem- or project-based learning		0.031	0.026
Written assignments			
Oral presentations			
Multiple choice exams			0.019

Only results presented that were significant at 1% level.

In all three cases, higher education variables and competences account for 7–8% of the total variance in the dependent variables. Particularly competences have quite strong and consistent effects (see Table 6.15). As we might expect, the ability to mobilize the capacities of others has the strongest effects on all three indicators, especially the chance that one supervises others. A similar pattern holds for the ability to coordinate activities and the ability to perform well under pressure, but the effects are not as strong. Contrary to expectations, the ability to make your meaning clear has no effect on any of the three outcomes, and the ability to work productively with others even has a negative effect on supervision and strategic decision-making authority. This seems to suggest a rather hierarchical attitude towards leadership. Surprising as well is the finding that the ability to use time efficiently significantly

Table 6.18 Mobilization of capacities of others, by experiences before, during or after higher education (regression coefficients)

	Supervise others	Quality control	Strategic decision-making authority
Experiences before the:			
• *Study-related work experience*	0.149	0.034	0.039
• *Non-study-related work experience*			
Experiences during the:			
• *Study-related work experience*			
• *Non-study-related work experience*			–0.022
• *Voluntary positions*	0.163		
• *Work placements*			
• *Experience abroad*			
Experiences after the:			
• *Work experience*	0.293	0.030	
• *Initial search duration*	–0.050	–0.047	–0.048

Table 6.19 Mobilization of capacities of others, by relative grade, cultural and social capital and parental role (regression coefficients)

	Supervise others	Quality control	Strategic decision-making authority
Study achievement			
• *Relative grade*			
Cultural and social capital:			
• *Quality of social network*		0.037	0.050
• *At least one parent has HE*			–0.018
Parent of young child (<5 yrs):			
• *Father*	0.241	0.039	0.058
• *Mother*	–0.334	–0.031	–0.041

reduces the chances that one is assigned a leadership role in terms of the three indicators.

As was the case for utilization, the competence cluster representing professional expertise has strong effects. This is not so surprising: one would expect employers to put someone who knows his or her stuff in charge. In contrast to what we saw for utilization, functional flexibility has a positive effect on quality control and strategic decision-making authority. Innovation and knowledge management has only a rather weak effect on strategic decision-making authority.

Programme characteristics have little effect on leadership (see Table 6.16). It seems that employers look for direct signals of leadership traits in terms of competences rather than relying on characteristics of the programmes graduates have followed. Graduates of second-level programmes are slightly more often employed

Table 6.20 Mobilization of capacities of others, by organization characteristics (regression coefficients)

	Supervise others	Quality control	Strategic decision-making authority
Self-employed		0.038	0.190
Public/non-profit sector	–0.318	–0.085	
Scope of operations (ref: local)			
• *Regional*			–0.036
• *National*			–0.075
• *International*			–0.102
Size of organization (ref. <10 employees)			
• *10–49*			–0.104
• *50–99*	–0.258	–0.035	–0.116
• *100–249*			–0.136
• *250–999*	–0.391		–0.132
• *1,000 or more*	–0.464	–0.025	–0.142
Market characteristics:			
• *Strong competition*		0.027	
• *Competition based on quality*			0.026
• *Unstable demand*		0.019	
Changes in organization:			
• *Reorganization*	0.395	0.072	0.047
• *Large-scale layoffs*			–0.030
Organization at the forefront of innovation	0.051	0.043	0.082
Extent to which performance is monitored		0.033	–0.059

as supervisors, while graduates who reported a high degree of freedom in composing their own study programme were less likely to be supervisors.

The reliance of employers on competences rather than educational proxies to assign leadership roles is further borne out by Table 6.17. Although several modes of teaching and learning have significant effects on quality control and strategic decision-making authority, the effects are quite weak. A strong emphasis on participation in research projects and on problem- or project-based learning has a positive effect on both indicators, while emphasis on theories and paradigms and – curiously – multiple choice exams increase the chances that one is responsible for strategic decision making.

The most marked effect of the experience variables (see Table 6.18) is a strong negative effect of search duration prior to the first job. Although several types of experience at work or in other activities have some effects, those are generally smaller than those of search duration. This leads to the somewhat cynical conclusion that employers seem to find it more important not to put someone in charge who has been out of work for a long time than to make sure that the person in charge has actual hands-on experience. An interesting point is that study-related experience before higher education and work experience after graduation, but not study-related

experience during higher education, have effects on leadership. Non-study-related experience shows a weak negative effect on strategic decision-making authority.

Table 6.19 shows that having a good social network can get you places at work. Although this has no effect on supervision, it does increase the extent to which one is responsible for quality control and/or strategic decision making. Confirming a widely held stereotype, employers would rather put dads in charge than mums. For women (the interaction effect with gender) the effect of having one or more young children is uniformly negative, while for men (the main effect), it is consistently positive.

Finally, Table 6.20 shows the effects of organization characteristics. Being self-employed trivially increases the extent of strategic decision-making authority, and only slightly less trivially the extent to which one is responsible for quality control. Graduates working in the public or non-profit sector are less likely to supervise and/or assess the work of others. Size and scope of organizations have the expected (trivial) effects on strategic decision-making authority. More interestingly, there is also a negative effect of size on supervision and quality control. It is not immediately obvious why these organizations would be less likely to let higher education graduates supervise or assess others.

Graduates working in organizations experiencing strong competition, and those working in organizations experiencing unstable demand are more likely to supervise and/or assess the work of others. There is, however, no effect on strategic decision-making authority. By contrast, the more competition is based on quality, the more responsibility graduates bear for strategic decision making.

The degree of stability of the organization and its environment seems mainly to work in the graduates' favour in terms of their being assigned leadership roles. We saw already that unstable demand increases graduates' role in quality control. Further, graduates in organizations that have undergone a reorganization since they started working there are much more likely to be supervisors and to bear responsibility for quality control and/or for strategic decision making. This is consistent with the idea that supervisors survive. However, graduates in organizations that have experienced large-scale layoffs are given less strategic decision-making authority. Innovations in product or service, or in knowledge or methods, appear to provide organizations with a reason to assign higher education graduates more leadership responsibility. Finally, the only characteristic to show opposing effects is the extent to which a graduate's own performance is monitored. Graduates for whom this is the case are in turn more likely to be responsible for controlling the quality of the work of others. This may suggest that the degree of control or monitoring may to some extent be a structural characteristic of organizations as a whole. In contrast, graduates whose work is closely monitored bear less strategic decision-making authority.

6.7 Conclusions

In this chapter we looked at several indicators of mobilization of human resources during and after higher education and attempted to shed some light on the factors that promote or inhibit such mobilization. When it comes to mobilizing their own

human resources while still in higher education, it seems that European students are somewhat economical with the effort they put into achieving good study results. To the extent that they put in more effort than strictly needed, they appear to be more often extrinsically than intrinsically motivated, aiming for higher grades rather than knowledge for its own sake.

If students don't work as hard as they might on their study, this does not mean that they are idle. On average students put in almost 30 months during their study on other activities, mainly paid employment. Contrary to what we might expect, there is little evidence for a trade-off between study and extra-curricular activities. There is no relation between work experience and study hours, and study-related work experience is even associated with increased study motivation (both intrinsic and extrinsic). By contrast, experience that was not related to the content of the study programme is associated with lower levels of study motivation. These results suggest that it is possible for students to mobilize their own capacities to a high degree both in study and in paid work, especially if the work is related to their study.

We found strong evidence that higher education institutions can influence the extent to which students mobilize their capacities. Graduates of programmes that were regarded as demanding reported longer study hours as well as higher levels of intrinsic and extrinsic motivation than graduates of less demanding programmes. In the case of study hours this is only to be expected, but one might imagine that students of programmes that are especially demanding would find doing extra work above the minimum requirements and striving for higher grades – the indicators used for respectively intrinsic and extrinsic study motivation – a luxury that they can ill afford. The positive effect of demanding programmes suggests that students who are challenged by a demanding programme rise to the challenge by working even harder than they need to get their degree.

Demanding study programmes are also highly effective in fostering competences that are thought to be relevant for mobilizing one's own and others' human resources in the world of work. A little surprisingly, study hours and intrinsic and extrinsic study motivation have almost no additional effects on these competences after controlling for the demandingness of the programme and other relevant aspects of higher education. Of these aspects, student-centred modes of teaching and learning and – more surprisingly – a strong emphasis on both theoretical and practical knowledge appear to be rather effective in imparting mobilization competences. The latter effect suggests that a good knowledge base may make it easier for graduates to make the most out their own and others' human resources. As we might expect, the acquisition of other forms of experience during high education through participation in extra-curricular activities also promotes competences relevant to mobilization of human resources, although the effects were less strong than might have been expected. The strongest effects are found for positions held in voluntary organizations during higher education, especially on the competences thought to be relevant for mobilizing the human resources of others. Study-related work experience was also related to higher levels of some of these competences.

In general, higher education graduates seem to be rather successful at mobilizing their own capacities in their current work. Most are employed in a more or less full-time capacity in jobs that match their own level and field of education. Relatively few graduates report that their capacities are underutilized. Even those graduates who work in jobs requiring no tertiary education often manage to utilize a good proportion of their capacities, particularly those competencies that were predicted to be relevant for mobilization of human resources. And graduates are not only active in the world of work: a large proportion are also engaged in training, family care or voluntary work. This even applies to full-time working graduates, although they are somewhat less likely to be engaged in family care or voluntary work (but not training) than graduates who work shorter hours or not at all.

As might be expected, fewer graduates are involved in mobilizing the capacities of others at work than who mobilize their own capacities to a high extent. Nonetheless, a considerable proportion of graduates also occupy positions in which they are responsible for mobilizing the capacities of others. About a third of graduates are supervisors, and about a quarter bear a high degree of responsibility for quality control. Especially in small organizations graduates often bear a high degree of strategic decision-making authority.

Perhaps the most striking finding of this chapter is that the degree of mobilization of own capacities appears to be more strongly influenced by one's own level of professional expertise than by specific mobilization competences. This effect is strong, even among graduates working in jobs not related to their field of study. It seems that possessing a high level of professional expertise enables graduates to better utilize their capacities in general, even when their work doesn't match their field of training. There are relatively few residual effects of higher education characteristics and experiences after competences have been taken into account. However, one's social network appears to be a good predictor of all forms of mobilization of human resources, suggesting that knowing the right people can help get one into demanding jobs with real authority. Graduates working in the public sector are more successful than their peers in the private sector at mobilizing their own capacities, but those working in the private sector are more likely to play some kind of leadership role in their organization. Working in an innovative organization has a positive effect on all forms of mobilization.

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Chapter 7
International Dimensions of Higher Education and Graduate Employment

Ulrich Teichler

7.1 The Growing Relevance of International Dimensions

"Internationalization" and "globalization" tend to be named as key issues in Europe when changes in the relationships between higher education and the world of work are under consideration. The technological and economic dynamics are often described in terms of globalization, whereby an increasing proportion of graduates are active in organizations which are globally interconnected. As a consequence, these graduates are expected to communicate in foreign languages with people from different cultures, to build up in-depth knowledge about other countries, and to serve as representatives of their organization abroad. Life in general is becoming more international, with growing migrant populations as well as more and more graduates opting for careers in other countries. Historically, universities have always been among the most international organizations anyway, and in recent years many curricular reforms have been undertaken to better prepare students, both for the globalizing world in general and for possible international careers in particular (cf. Altbach, 2006; Huisman & van der Wende, 2005; Knight, 2006; Teichler, 2004). Last but not least, an increasing number of students – many of them mobilized by the ERASMUS Programme of the European Union – opt for temporary student mobility, whereby most of them expect that this will help them to cope more successfully with the increasingly international character of the world of work and other spheres of life, and that it will enhance their careers (see Janson, Schomburg & Teichler, 2009; Teichler, 2002).

In the framework of the REFLEX study on graduate employment and work, attention has been paid to international mobility over the life course: graduates' country of origin as well as the country where they lived, studied and worked in different life stages. This allows us not only to analyse patterns of mobility over these life stages, but also to examine how internationally mobile graduates

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differ from their non-mobile peers in the early stages of the career. With a view to shedding some light on the increasingly international character of work, the REFLEX study has addressed the role foreign language proficiency plays. This makes it possible to both identify the kinds of jobs and organizations in which high levels of foreign language skills are required and to examine how the careers of graduates who are highly proficient in foreign languages differ from those of graduates who are less proficient in this respect. Moreover, as similar questions were posed in the CHEERS, the precursor of the REFLEX project, it is possible to determine what changes have occurred in this respect between the 1994/1995 graduate cohort and the 1999/2000 cohort (Jahr & Teichler, 2007; Teichler & Jahr, 2001).

In the following section, an overview will be provided of the mobility that has occurred in graduates' early life stages, during their course of higher education study and during the first few years after graduation. Subsequently, we will examine the extent to which mobility during the course of study and shortly afterwards has an impact on employment and work. Following this, the relevance of foreign language proficiency for graduates' professional life will be examined. Finally, we will look at how the careers of those employed in their home country differ from those of graduates who have been internationally mobile since graduation.

7.2 International Mobility

7.2.1 Information Available

The REFLEX study addressed international mobility at various stages of graduates' lives. First, graduates were asked to state whether they and their parents were born abroad, and whether they lived in a foreign country:

- at the age of 16,
- during their course of study,
- when they became employed for the first time after graduation, and
- at the time the survey was conducted, i.e. about five years after graduation.

Second, they were asked to provide information whether they spent time abroad during their time in higher education for study and/or work. Those who reported having spent some time abroad were asked as well about the length of their stay abroad.

Third, similar questions were posed regarding international mobility after graduation. Graduates provided information on whether they spent any time abroad after graduation for study and/or work, and on their country of employment at the time the survey was undertaken. Again, mobile graduates were asked to indicate the length of their stay abroad.

7.2.2 Migration and Mobility Prior to Study

As Fig. 7.1 shows, about 4% of graduates surveyed in the REFLEX study were born in another country than that in which they graduated; we can assume that most of them were foreign citizens. This is more or less the same percentage as was found five years earlier in the CHEERS project. The proportion of graduates who were born abroad varies from about 10% in Switzerland and the United Kingdom to only 2% or less in Belgium, the Czech Republic, Estonia, Finland, Italy and Spain.

About twice as many of the REFLEX graduates' parents as the REFLEX graduates themselves were born in another country. The number of respondents living in the country of graduation since birth whose parents were immigrants is about as high as the number of respondents who were born in another country and came to the country of graduation either as migrants' children or moved to this country for the purpose of studying the full degree programme.

About 2% of respondents lived at the age of 16 in a different country from that in which they graduated. This suggests that around half of foreign-born graduates did not move to the host country as a young child or while in secondary school, but came later, presumably for the purpose of study.

Available educational statistics show that about 6% of students in the European countries analysed in the late 1990s were foreign students (cf. Kelo, Teichler, & Wächter, 2006; UNESCO, 2006). There are two factors which probably account for the fact that the proportion of foreigners among graduates according to the REFLEX survey is slightly lower. First, some of the foreign students included in the educational statistics are only short-term exchange students who eventually graduate in the home country. Second, foreign students seem to be less likely to successfully complete higher education than home students.

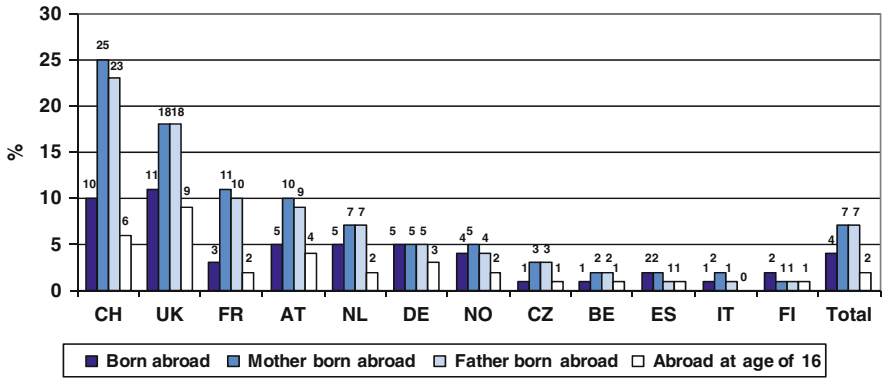

Fig. 7.1 Mobility prior to study by country (%) [No data available for Estonia]

7.2.3 Mobility During the Course of Study

Twenty-six percent of graduates reported that they spent time abroad for study and/or work during their course of study. Twenty-one percent spent time abroad for study and 7% for work. This means that about 2% spent time abroad for both study and work. Other student and graduate surveys suggest that most students who report work abroad actually refer to an internship, that is, working experience linked to their study.

Figure 7.2 shows substantial differences between countries in mobility during the course of study. However, even in countries where temporary periods abroad for study and/or work were less common than average – Spain, Italy, the United Kingdom, Estonia and Norway – a period spent abroad for study or work is by no means an exception. The proportion ranges even in these countries from 16 to 19%.

Figure 7.2 shows as well that many graduates from the Czech Republic (17%) and Finland (14%) had spent a period of time abroad for work during their course of study. By contrast, few Italian and Spanish graduates participated in an internship or other period of work abroad while enrolled in higher education. As Fig. 7.3 shows, those who spent time abroad during higher education for study and/or work spent on average seven months abroad for study and six months for work.

These findings confirm by and large the results of earlier studies of temporary student mobility in Europe. Of the respondents of CHEERS survey who graduated five years earlier, 18% had spent some time abroad during the course of study for study and/or work (Jahr & Teichler, 2007), that is about a third less than the respondents of the REFLEX survey. These results underscore the findings in other student surveys that temporary student mobility was clearly on the rise in Europe over the 1990s.[1]

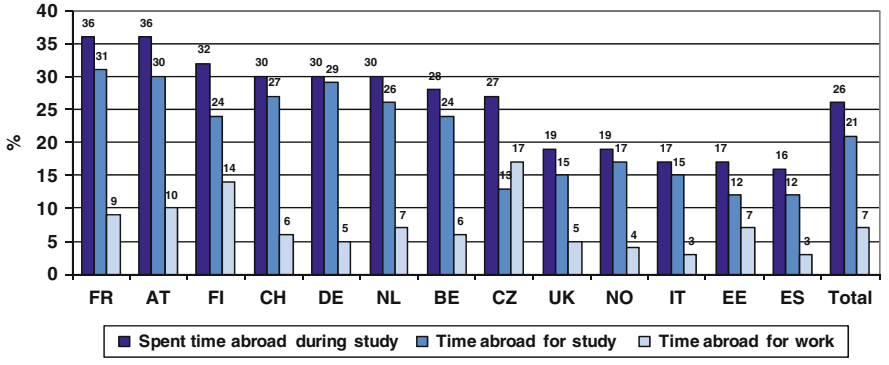

Fig. 7.2 Mobility during the course of study by country (%)

[1] It should be noted that no Europe-wide statistics are available on this issue (see the overview of available statistics in Kelo et al., 2006; data available for Germany and Italy are in line with

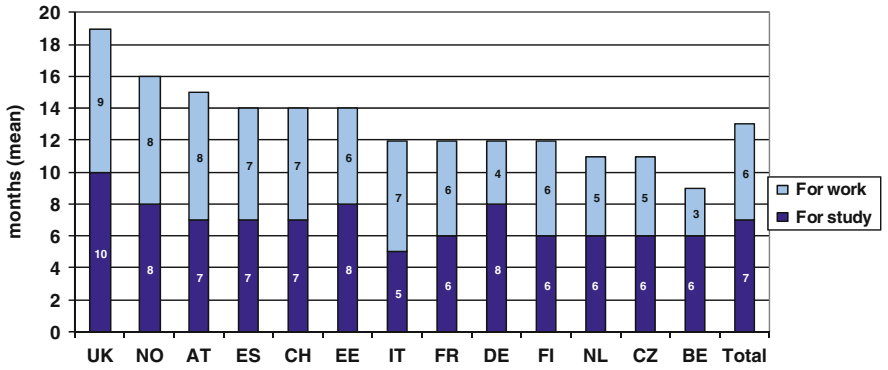

Fig. 7.3 Time spent abroad during higher education by internationally mobile students (mean months)

7.2.4 Mobility After Graduation

Altogether, 22% of graduates surveyed who were born in the country where they graduated in 1999/2000 have spent time abroad since graduation for study and/or work (see Fig. 7.4). In contrast to mobility during higher education, which was mostly for study purposes, most mobility after graduation has been for work. Just 7% reported that they had spent some time abroad after graduation for the purpose of further study. This proportion was highest among graduates from Estonia (13%) and Switzerland (12%). Altogether, 40% of respondents undertook further studies within the first five years after graduation. This means that about one in six of the graduates embarking on further study did so at least in part in another country. Sixteen percent

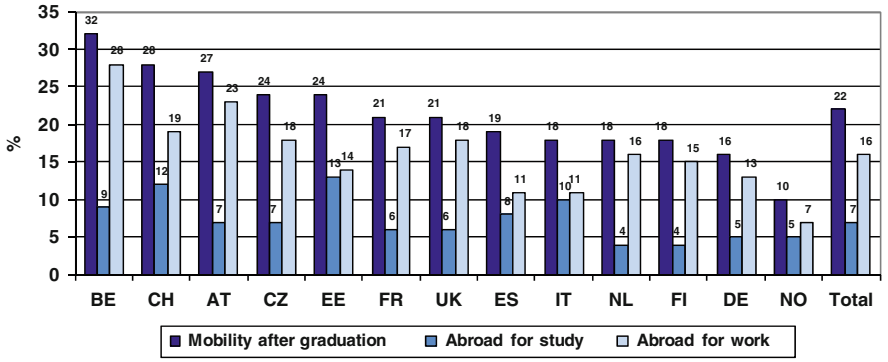

Fig. 7.4 International mobility during the first five years after graduation by country (% of those graduating in their home country)

the findings presented in Fig. 7.2; see Teichler, 2006). Consequently, the findings presented here represent a valuable contribution to our knowledge of student mobility in Europe.

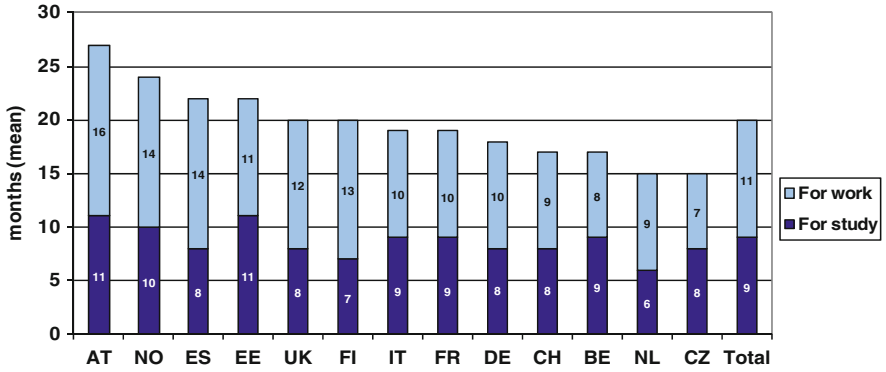

Fig. 7.5 Time spent abroad since graduation by internationally mobile students (% of those graduating in their home country)

of graduates spent at least some time abroad *after graduation for work*. As Fig. 7.4 shows, this proportion was clearly highest among those who graduated in Belgium (28%) and Austria (23%).

For those graduates who studied abroad since graduation, the average *period* for which they did so was nine months (see Fig. 7.5). On average, those working abroad during the first five years after graduation did this for 11 months.

It is interesting to make a distinction between graduates who have worked abroad for a short time – less than a year – and graduates who have put in a longer stay abroad. One may assume that the former group of graduates are less serious about international mobility than the latter, for many of whom a career abroad may be a real option, as opposed to for example a short stay abroad commissioned by an employer in their home country. Figure 7.6 shows that most graduates who have been internationally mobile for work since graduation have done so for a relatively short stay. Only 5% of graduates across all countries have worked abroad since

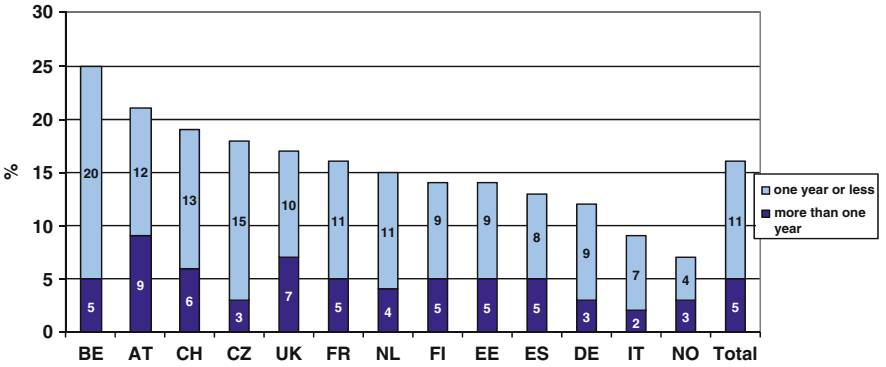

Fig. 7.6 International mobility during the first five years after graduation by country (% of those graduating in their home country)

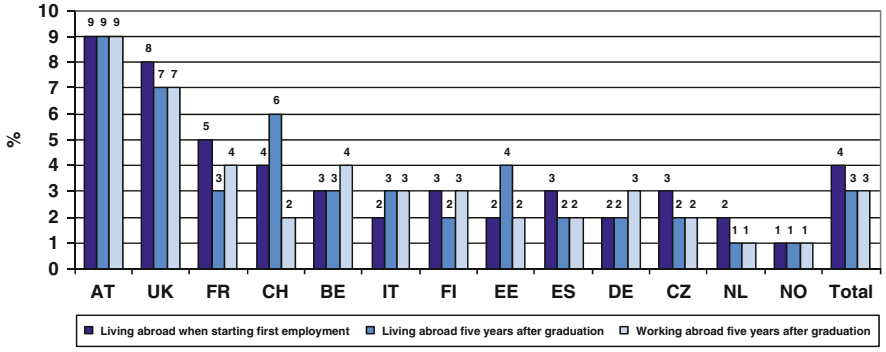

Fig. 7.7 Living and working abroad since graduation (% of those graduating in their home country)

gradation for more than a year. The countries that show the highest levels of longer term work mobility are Austria and the United Kingdom.

The low levels of longer term work mobility are reflected in low percentages of graduates who have actually taken up residence in another country. Figure 7.7 shows that only 4% lived abroad at the time of first employment after graduation, and 3% lived abroad five years after graduation, that is, at the time of the survey. We also note that 3% of those employed five years after graduation worked abroad at that time. For the most part the graduates working abroad are likely to be the same graduates who are living abroad, but we see some small discrepancies in some countries. Such discrepancies are most likely to occur because graduates commute across national borders to work (either living in their home country and commuting abroad or vice versa), but could also be due in part to the fact that not all those living abroad actually have paid work. The proportion of graduates living and working abroad is highest in countries with high levels of longer term work mobility, notably Austria and the United Kingdom.

The results presented above are quite consistent with those of the CHEERS survey, which found that about 3% of graduates were employed abroad when they started their career, and that the same proportion worked and lived abroad at the time of the survey. Eighteen percent of graduates reported that they had worked abroad for some period, the majority of whom were commissioned for some period abroad by their home country employer (Jahr & Teichler, 2007). The results of both the REFLEX and CHEERS surveys are also consistent with available labour market statistics, which suggest that only about 3% of the highly qualified labour force in Europe are nationals of other European countries. There is no indication that international work mobility has increased in recent years. However, the relatively small numbers involved combined with the differences in research methodology between the REFLEX and CHEERS surveys make it impossible to draw any firm conclusions on this point.

Of graduates surveyed in the REFLEX study who worked abroad five years after graduation, 17% chose to work in Germany, 12% in the United Kingdom, 11% in

Table 7.1 Major countries of work abroad five years after graduation by country of graduation (% of those graduating in their home country)

Country of employment	ES	IT	FR	CH	AT	DE	NL	BE	UK	NO	FI	CZ	Total
Germany	12	9	16	22	43	*	32	7	2	0	12	20	17
United Kingdom	17	16	5	21	4	10	7	21	*	9	12	34	12
Switzerland	0	9	31	*	15	16	0	0	6	0	8	3	11
United States	16	9	0	16	6	18	12	7	15	35	4	4	9
Netherlands	2	0	3	7	3	2	*	33	0	10	6	6	7
France	13	9	*	15	2	6	2	16	13	0	0	2	6
Belgium	6	6	5	5	3	5	11	*	2	0	4	8	4
Luxembourg	2	0	13	0	1	15	0	2	0	0	0	0	4
Sweden	0	3	0	0	0	3	4	0	0	34	23	1	3
Spain	*	10	4	3	0	2	0	2	0	0	6	1	3
Ireland	6	3	2	0	0	0	4	0	12	6	7	0	2
Canada	2	3	8	0	0	3	3	0	3	0	0	3	2
Italy	8	*	0	5	3	0	0	0	7	0	0	1	2
Denmark	1	5	0	0	1	0	0	0	0	0	9	0	1
China	0	2	3	0	1	2	0	0	2	0	0	0	1
Liechtenstein	0	0	0	3	5	0	0	0	0	0	0	0	1
Austria	2	3	0	2	*	3	0	0	0	0	4	1	1
Norway	3	0	0	0	0	0	0	0	6	*	4	0	1
Australia	0	0	0	0	2	0	3	0	5	0	0	0	1
United Arab Emirates	0	0	0	0	2	0	0	2	0	0	0	0	1
Russia	0	1	0	0	1	0	3	0	3	0	0	1	1
Thailand	0	0	0	0	0	6	4	0	0	0	0	0	1
Slovakia	0	0	0	0	0	0	0	0	0	0	0	10	1
Romania	0	0	3	0	1	0	0	0	0	0	0	0	1
South Africa	0	0	0	0	3	0	0	0	0	0	0	0	1
Portugal	8	0	0	0	0	0	0	0	0	7	0	0	1
Other	2	13	5	0	7	10	15	10	24	0	2	5	8

* - No answer.

Switzerland and 9% in the United States (see Table 7.1). The proportion working in the United Kingdom and the United States is lower than was observed in the CHEERS survey, where each of these two countries as well as Germany were each the chosen destination for some 15–16% of mobile graduates. Again, the relatively small numbers and slightly different research mobility make it difficult to draw any firm conclusions from this. Not surprisingly, we see a strong tendency for mobile graduates to work in countries with a border with their home country. Germany is especially popular with Austrian, Dutch, Swiss and Czech graduates, Switzerland with French, German and Austrian graduates, and the Netherlands with Flemish graduates. In the latter case the shared language is undoubtedly a factor, and several of the abovementioned countries also share a common language as well as a border. In the case of the United Kingdom and the United States, language again, rather than proximity, appears to be the factor, albeit the world language of English rather than the language of the home country.

Of the graduates who participated in the REFLEX survey who were still living abroad at the age of 16 – in most cases shortly before entering higher education – 27% were employed abroad five years after graduation, mostly in their country of birth.

7.3 The Impact of International Mobility on Employment and Work

7.3.1 The Manifold Relevance of Early International Mobility

Various earlier studies have shown that international mobility prior to or during higher education is related to a higher incidence of international careers after graduation, and of more internationally oriented employment in the home country. These earlier studies are less conclusive with respect to whether international experience leads to more high-flying careers *in general*. In fact, surveys of former ERASMUS students suggest that these students expect to reap benefits from their experience abroad when they enter the labour market, but that such benefits are not evident a few years after graduation (see Janson, Schomburg, & Teichler, 2009; Maiworm & Teichler, 1996; Teichler, 2002). It is therefore interesting to compare the careers of internationally experienced REFLEX respondents to those not mobile prior to and during the course of study.

7.3.2 The Distinct Profile of Mobile Graduates

It is widely assumed that those who opt to go abroad for study or work are a somewhat select group. If this is true, any career benefits that seem to accrue to mobile students might in reality be due to differences in socio-biographic background and/or the specific course of study chosen between mobile and non-mobile students. It is often argued that mobile students often come from high-status families, and they are often depicted as highly motivated and energetic persons, whose values and abilities might turn out to be attractive to employers in any case. Of course, one cannot simply assume that these arguments are well founded. For one thing, the ERASMUS programme, which is the single most important institutional driver of international mobility of students in Europe, is clearly aimed at a broad range of students in terms of socio-biographic background, country and field of study, as well as academic ability. Studies suggest that ERASMUS is only socially selective when compared with all young people in Europe, but not when compared with those young people enrolled in higher education. Nonetheless, it is prudent to take into account the *possibility* of selectivity when considering the relation between mobility and career outcomes.

Since outcomes – including current levels of competences – can be influenced by international mobility since graduation from higher education as well as by mobility

during higher education, it is appropriate to examine the impact of mobility in both life stages. It turns out that 15% of graduates who were born in the country where they graduated were mobile *only during higher education*, 11% had been mobile *only since graduation*, while 10% had been mobile *both during and since their time in higher education*.

Figure 7.8 shows how these forms of mobility are related to the *socio*-biographic background of graduates. Graduates who were mobile only during higher education differed little from non-mobile graduates in terms of gender, but those who had been mobile since graduation were much more likely to be men, especially those who had not been mobile during higher education as well. All three groups of mobile graduates were more likely to have at least one parent with a higher education degree. This applied more to mobility during higher education than mobility after, and even more to those who were mobile both during and after higher education.

As Fig. 7.9 shows, mobile graduates, especially those who were mobile during higher education, and even more when this was combined with mobility after graduation, are more likely than non-mobile graduates to have graduated from second-level programmes (i.e. those higher education programmes that provide direct access to PhD programmes). International mobility of all kinds is related to higher than average grades.

As Fig. 7.10 shows, graduates who were mobile during higher education – whether in combination with mobility after graduation or not – are relatively likely to have been enrolled in Humanities programmes. However, those who were only

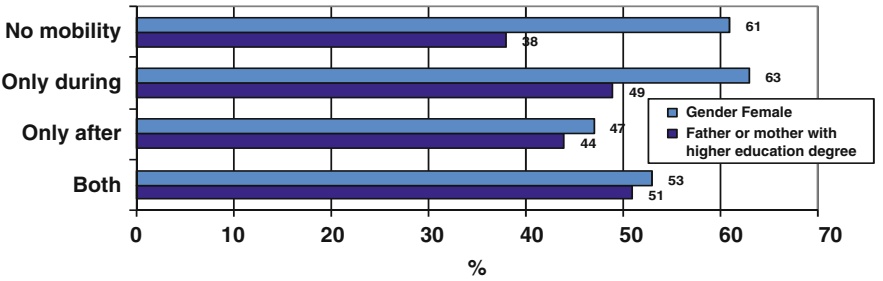

Fig. 7.8 Socio-biographic background by international mobility during and shortly after the course of study (% of those graduating in their home country)

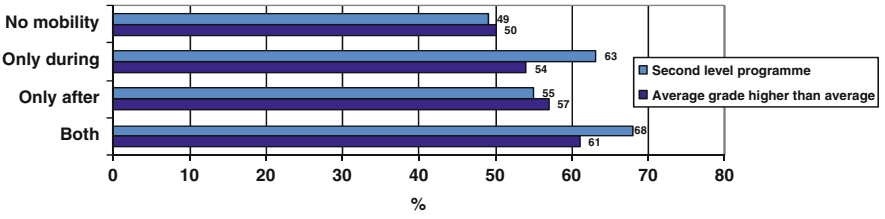

Fig. 7.9 Programme level and average grades by international mobility during and shortly after the course of study (% of those graduating in their home country)

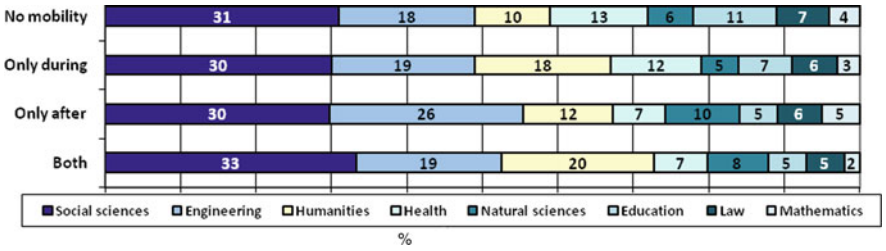

Fig. 7.10 Field of study by international mobility during and shortly after the course of study (% of those graduating in their home country)

mobile after graduation were hardly any more likely than non-mobile graduates to come from Humanities programmes. The opposite pattern appears for Engineering, which is only overrepresented among graduates who were only mobile after higher education. Health graduates were only strongly mobile during higher education, while graduates in the Natural Sciences appear to have been mainly mobile after graduation. Education graduates are underrepresented among all groups of mobile graduates.

One might suppose that mobility, at least during higher education, would make it more difficult for students to acquire other forms of experience during higher education. As Fig. 7.11 makes clear, this does not seem to be the case. In fact, mobile graduates – especially those who were mobile during higher education – were more active in student organizations or other voluntary organizations and were more likely to have acquired work experience (both study-related and non-study-related) during higher education. Those who were only mobile during higher education were also somewhat more likely to have participated in internships or work placements during higher education, but those who were mobile after graduation were less likely to have done so. It is likely that the increased proportion of internships during higher education among graduates who were mobile in this period reflects the fact that a large proportion of this mobility was precisely for this purpose.

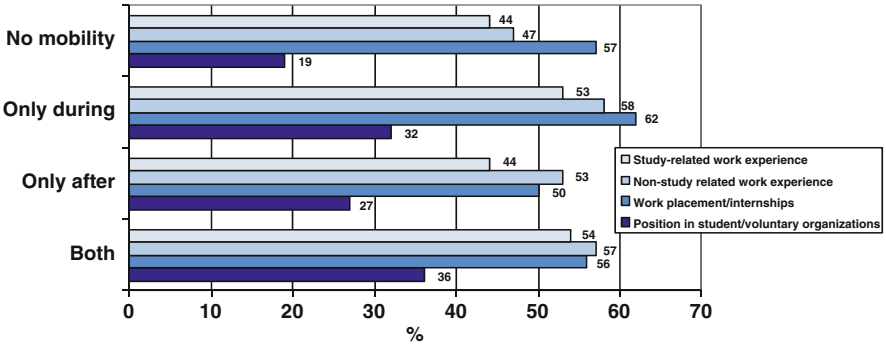

Fig. 7.11 Other experiences gained during higher education by international mobility during and shortly after the course of study (% of those graduating in their home country)

7.3.3 Relation Between Mobility and Competences

If mobility has an effect on labour market outcomes, it is reasonable to suppose that at least part of that effect is due to differences in competences between mobile and non-mobile graduates.[2] In this section we look at the relation between mobility during or after higher education and the level of competence in the five key domains covered by the REFLEX project. Although we can't be certain that this is a causal relation – students or graduates may be mobile because their competences allow this, or may become more competent as a result of mobility – it is important to be aware of any differences that exist.

As Fig. 7.12 shows, mobile graduates have much better foreign language skills than non-mobile graduates. Especially graduates who were mobile both during and after higher education have good foreign language skills. This is what we would expect. In other respects, however, there is little difference between mobile and non-mobile graduates in terms of competences. Those who were mobile only during higher education had almost identical levels of competence in the other four domains as those who were not mobile. Those who were mobile after graduation seemed to show slightly higher levels in these other domains, but the differences are slight.

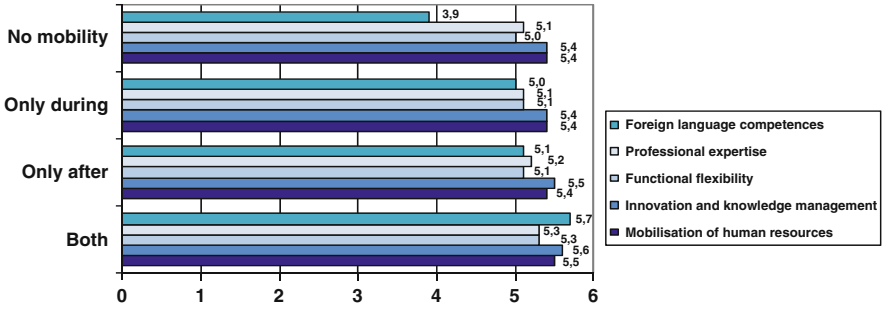

Fig. 7.12 International mobility during the course of study and shortly after study and rating of competences[3] five years after graduation (% of home graduates)

7.3.4 Impact on Employment and Work Five Years After Graduation

International mobility during or after higher education seems to be related to somewhat better labour market outcomes five years after graduation but in other respects there are no appreciable difference or even an apparent disadvantage for mobile graduates. Figure 7.13 shows that mobile graduates were somewhat more likely to

[2]There are other ways in which it might affect outcomes, for example through contacts with employers.

[3]Competences rated on a 7-point scale ranging from 1 "very low" to 7 "very high". Foreign language competences are based on a single item, foreign language proficiency. See Chapter 2 for operationalization of the other four competence domains.

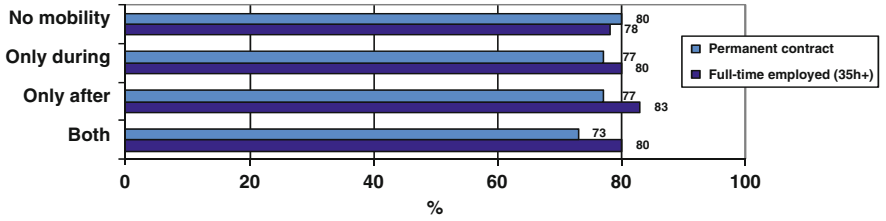

Fig. 7.13 The relation between international mobility and terms of employment five years after graduation (% of home graduates living in home country five years after graduation)

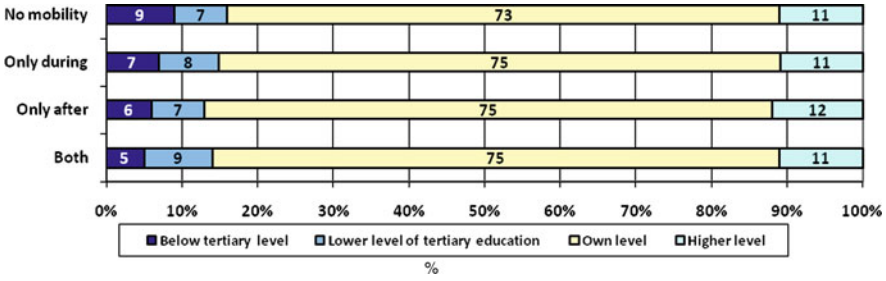

Fig. 7.14 The relation between international mobility and level of education considered most appropriate for job five years after graduation (% of home graduates living in home country five years after graduation)

be working full time five years after graduation, but that this is more likely to be in a job with a temporary contract.

As Fig. 7.14 shows, mobile graduates are less likely to work in a job for which a lower level of education than their own is considered appropriate. This applies especially to graduates who were mobile only after graduation. These graduates were slightly more likely than other graduates to have a job for which a higher level than their own is considered appropriate.

The view of mobile graduates working in relatively high level jobs is further confirmed by Fig. 7.15, which shows the occupational group in which graduates

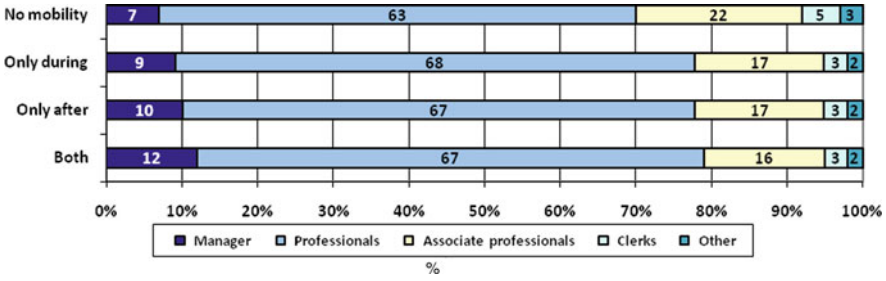

Fig. 7.15 The relation between international mobility and occupational group five years after graduation (% of home graduates living in home country five years after graduation)

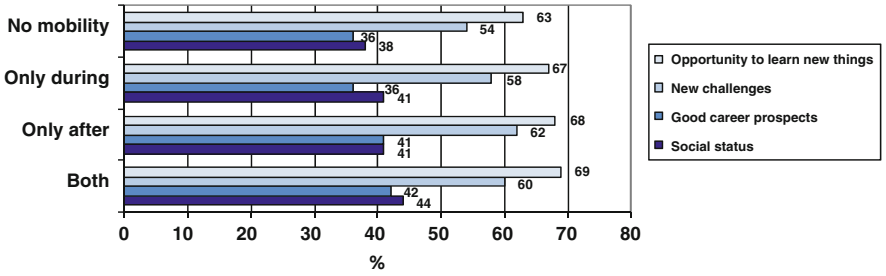

Fig. 7.16 The relation between international mobility and job characteristics five years after graduation (% of home graduates living in home country five years after graduation)

were working five years after graduation. Mobile graduates were clearly more likely than non-mobile graduates to be employed as managers or professionals.

As part of the REFLEX survey, graduates were asked to indicate the extent to which a set of characteristics applied to their current job. Figure 7.16 shows how some of these characteristics are related to international mobility during or after higher education. Mobility, especially after graduation, is associated with more opportunities to learn new things in one's work, with new challenges, with good career prospects and with a higher social status.

As Fig. 7.17 makes clear, mobile graduates are more likely to work in innovative organizations five years after graduation. This applies especially to mobility after graduation, and more to innovation in terms of product or service and technology, tools or instruments than to innovation in terms of knowledge or methods.

As Fig. 7.18 shows, mobile graduates are much more likely to work in an organization with an international scope of operations than non-mobile graduates. As we would expect, this mainly applies to graduates who have been mobile after graduation, more than half of whom work in internationally oriented organizations. However, even those who have only been mobile during higher education are clearly more likely to work in an internationally oriented organization than non-mobile graduates. This suggests that mobility during the course of study stimulates graduates to seek work in an international environment, and that internationally

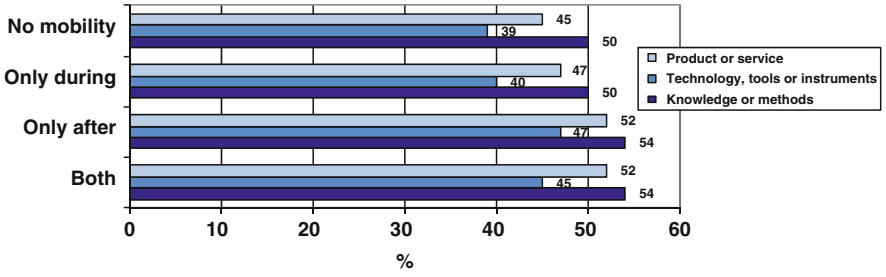

Fig. 7.17 The relation between international mobility and the extent of innovation in the organization where graduates work five years after graduation (% of home graduates living in home country five years after graduation)

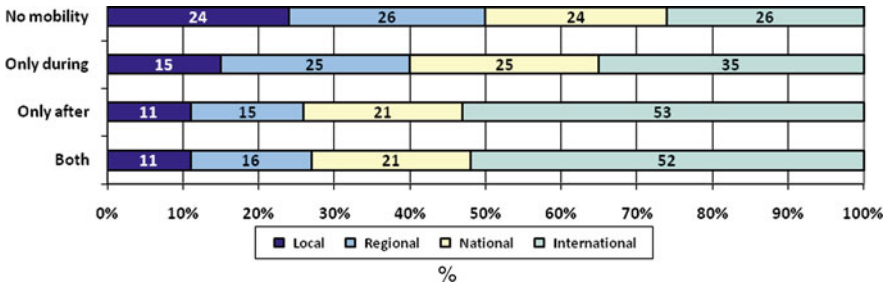

Fig. 7.18 The relation between international mobility and the scope of the organization in which graduates work five years after graduation (% of home graduates living in home country five years after graduation)

oriented organizations are interested in hiring them. It is interesting to note that the higher percentage of mobile graduates employed in internationally is almost entirely accounted for by a reduction in employment at the regional and local levels. Employment at the national level is only slightly lower among mobile than among non-mobile graduates.

Figure 7.19 shows the gross monthly income of full-time employed graduates five years after graduation, by mobility status. It is clear that mobile graduates do better than non-mobile ones. Intriguingly, those who were mobile during higher education did better than those who had only been mobile after graduation, although those who had been mobile both during and after higher education did equally well as those who were only mobile during higher education.

As already pointed out, the data presented above cannot be viewed as direct impact measures, because they might be influenced by other factors, such as country of graduation, field of study, kind of degree, etc. For that reason it makes sense to show results after controlling for such factors. It would be tedious to present all the abovementioned outcome variables again, but a good indication of the importance of such controls can be obtained by presenting results for the last indicator, gross monthly income. This is shown in Table 7.2. The multiple regression analysis was performed separately for countries and study programmes within countries (first- and second-level programmes) in order to check whether the relevance of international mobility during study depends on country and level of degree. Because the direction of causality is not clear in the case of the relation between mobility after

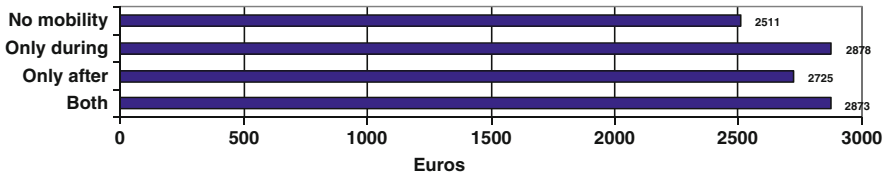

Fig. 7.19 The relation between international mobility and monthly income five years after graduation (% of home graduates living in home country five years after graduation)

Table 7.2 The professional impact of international mobility *during study* by country and type of study programmes (significant regression coefficients; OLS)

	Model 1		Model 2	
	First level	Second level	First level	Second level
IT		++		++
ES		++		++
FR		++		++
AT				+
DE	++		++	
NL				
UK				
FI				
NO	++	+	++	
CZ		++		++
CH				
BE				++
EE				

+ significant at 5% level.
++ significant at 1% level.

graduation and current income, we limit the analysis to the effects of mobility during higher education. Two models were developed and tested. In the first model, only field of study (dummies) and international mobility (dummy variable) were included. In the second model relevant socio-biographic variables (gender, school performance) and aspects of study behaviour (work experience, activities in student organizations) were added.

Table 7.2 makes clear that, in some countries at least, there is a significant effect of mobility on graduates' incomes. Furthermore, it seems that the links between mobility and income is mostly not spurious: the effect remains visible even after controlling for relevant socio-biographic and educational factors. However, the effects are not universal, but are rather restricted to certain countries and types of study programmes. Regarding countries, we note that mobility has no significant impact at all on incomes in Finland, Estonia, the Netherlands, Switzerland and the United Kingdom. Regarding types of programmes, mobility is more often beneficial for graduates of second-level programmes, which provide direct access to a doctorate programme, than for graduates of first-level programmes. Germany and Norway form exceptions to this general rule: in both of these countries, there are strongly significant effects of mobility on incomes for first-level graduates, but none at all – at least after the relevant controls have been added – on the incomes of second-level graduates.

7.4 Foreign Language Proficiency

The only competence measure included in the REFLEX study that addresses the domain of international orientation of graduates is foreign language proficiency. Although this is obviously only a narrow part of international orientation, it is

interesting to focus on the differences in employment and work situation between those graduates with high and those with low foreign language requirements in their work, as well as between those with high and low language proficiency. To begin with, we can note that international experience is a key factor for acquiring foreign language proficiency. Eighty-four percent of graduates who were internationally mobile during or after completion of higher education rated their foreign language proficiency as high, compared to 40% of those who were not mobile. Table 7.3 shows how required and actual foreign language proficiency is related to a number of key aspects of employment and work.

Jobs requiring a high level of foreign language proficiency are as a rule "better jobs", based on a large range of indicators of employment and work success. As Table 7.3 shows, jobs requiring a high level of foreign language proficiency

Table 7.3 Foreign language proficiency and select aspects of employment and work five years after graduation (% of home graduates living or working at home five years after graduation)

	Language competences		Language requirements	
	Low	High	Low	High
Permanent contract	80	77	79	78
Full-time employed	79	80	78	83
Appropriate (sub)level of education current job				
Higher level	12	10	10	12
Same level	72	75	71	76
Lower level of tertiary education	7	8	8	7
Below tertiary level	9	7	10	5
Occupational position				
Manager	7	9	7	10
Professionals	62	68	62	69
Associate professionals	22	17	22	17
Clerks	6	4	6	3
Other	3	2	4	1
Job characteristics				
Opportunity to learn new things	61	67	59	73
New challenges	53	60	51	66
Good career prospects	34	36	31	42
Social status	35	41	34	45
Working in innovative organizations regarding				
Product or service	43	52	42	56
Technology, tools or instruments	36	44	34	50
Knowledge or methods	48	54	46	59
Scope of operations of organization				
Local	27	16	27	12
Regional	27	21	29	16
National	24	22	25	20
International	22	42	19	52
Gross monthly income job 2005 (mean)	2,414	2,775	2,454	2,750

are characterized by a higher proportion of graduates with a high social status, occupying positions as managers or professionals, good career prospects, good opportunities to learn on the job and facing new challenges to a high degree. In addition, jobs requiring a high level of foreign language proficiency are characterized by considerably higher wages, are more often full-time jobs, are somewhat more likely to have a level for which at least the graduate's own level is considered appropriate, and are more likely to be in internationally oriented and/or highly innovative organizations.

Altogether, job characteristics differ more strongly according to foreign language requirements than according to actual language proficiency of graduates. Additional analyses – not shown here – reveals that careers for those whose jobs require a high level of foreign language proficiency *and* who have also acquired a high level of foreign language proficiency are better than those of graduates for which either one or the other does not apply. These analyses also show that foreign languages play a varying role according to economic sector, with strong foreign language requirements in the production sector of the economy, but much weaker than average requirements in health and social work. In the production sector, the difference in foreign language requirements between the "better" jobs and jobs at a lower level is also greater than in the health and social work sector.

7.5 Internationally Mobile Careers Compared to Home Careers

As already reported, about 3% of REFLEX respondents worked abroad five years after graduation. As we might expect, this percentage is by far the highest among graduates who were still living abroad at the age of 16, and who presumably came to the reference country specifically to study in higher education. Some 27% of these graduates were working in a different country – most cases their country of birth – five years after graduation. Among graduates born in the country in which they graduated, there were strong differences in the proportion of those working abroad between graduates who had been internationally mobile during higher education (5%) and graduates who were not mobile during higher education (3%).

In some respects, those working abroad do better than those working at home (see Table 7.4), but the differences are less pronounced than those between jobs requiring a high level versus a low level of foreign language proficiency. Those working abroad were much more likely to report good career prospects, opportunities to learn, a high status, good job prospects, and new challenges, and work often in more innovative organizations, especially with respect to technology, tools or instruments. There were also differences, although less pronounced, in the proportion of graduates working in professional positions, and in jobs with a high status, good job prospects, new challenges and opportunities to learn new things. As we would expect, graduates who work abroad differ most strongly from those who work in the home country in terms of the probability of being employed in an organization with an international scope. On the other hand, those working abroad were less likely to have a permanent job.

Table 7.4 International career and select aspects of employment and work five years after graduation (% of those who graduated in their home country)

	Home	Abroad
Permanent contract	79	68
Full-time employed	80	84
Appropriate (sub)level of education current job		
Higher level	11	14
Same level	73	70
Lower level of tertiary education	8	9
Below tertiary level	8	8
Occupational position		
Manager	8	8
Professionals	65	69
Associate professionals	19	16
Clerks	5	2
Other	3	4
Job characteristics		
Opportunity to learn new things	64	74
New challenges	57	66
Good career prospects	35	45
Social status	38	44
Working in innovative organizations regarding		
Product or service	47	55
Technology, tools or instruments	40	55
Knowledge or methods	51	60
Scope of operations of organization		
Local	22	7
Regional	24	13
National	23	12
International	32	68

As Table 7.5 shows, graduates working abroad generally have a clear income advantage, but this varies strongly by country and by field of study. When expressed as a percentage of the income of graduates working in the home country, the greatest income advantages of those working abroad are reported by graduates from Spain, Italy and Germany. By contrast, there is hardly any difference in the United Kingdom and Norway, and Swiss graduates working abroad even have a 19% lower income on average than their peers working at home. Obviously, these figures are influenced to a high degree by whether the country of origin is a high income or a low income country. In the latter case the chance of earning a higher wage when working abroad is much greater than in the former case. Against this background, the income premium of Germans working abroad is remarkable.[4] In terms of fields of study, there are big income premiums for graduates in the fields of

[4]In terms of hourly wage, graduates working abroad earned about 16 Euros, compared to 14 Euros for those working at home. It is difficult to establish the extent to which this is due to specific

Table 7.5 Monthly income of those working at home and those working abroad by country and field of study (EURO)

	Home	Abroad	Difference	Dif %
Country				
IT	1,662	2,320	658	40
ES	1,487	2,115	628	42
FR	2,213	2,967	754	34
AT	2,683	3,269	586	22
DE	3,684	5,081	1,397	38
NL	2,401	2,962	561	23
UK	2,756	2,895	139	5
FI	2,576	3,054	478	19
NO	3,661	3,799	138	4
CZ	874	1,051	177	20
CH	4,281	3,466	−815	−19
Field of study				
Education	2,186	2,201	15	1
Humanities	2,158	1,930	−228	−11
Social sciences	2,569	3,266	697	27
Law	2,690	3,576	886	33
Natural sciences	2,483	2,814	331	13
Mathematics	3,050	4,522	1,472	48
Engineering	2,760	3,719	959	35
Medicine	2,690	2,793	103	4

Mathematics, Engineering and Law who work abroad. By contrast, graduates in the field of Education have no appreciable income benefit for working abroad, and graduates in Humanities do better when they stay at home.

7.6 Concluding Observations

All in all, for the cohort of those graduating from European institutions of higher education around 2000, the choice of where to enrol in higher education studies and where to work after graduation has remained very much a national affair. Only 4% were born outside their country of graduation, and only 3% worked outside that country five years after graduation. Despite this, higher education in Europe is characterized by a rather high degree of internationalization. More than a quarter of graduates reported that they spent a period abroad during higher education for study or work (whereby work abroad is also often related to study, in the form of internships or similar arrangements). And many graduates work in jobs in which a high degree of foreign language proficiency is required. The results presented in this chapter (and in other studies) suggest that international experience during or after graduation from higher education clearly increases the chances of subsequent

allowances for foreigners to compensate for the inconvenience of working abroad, as opposed to a "real" income enhancement.

international mobility and of jobs on the domestic market that require international competencies. This shows that there is a strong "horizontal" link between international learning and experience on the one hand and international work on the other hand.

There are "vertical" links as well, that is, between international experience and career success, though less close and less consistent. In some respects, work abroad and work requiring visible international competencies are positively rewarded in terms of status and desirable work tasks. Time spent abroad during higher education often results later in more attractive careers in some respects. But these "vertical" advantages do not hold true in all respects. For example, international careers are often connected with lower job security. Moreover, some apparent advantages may be spurious, because international careers and international job requirements are more likely in economic sectors and occupational groups which have an above-average status. Finally, some of those who were born outside their country of graduation are migrants experiencing unequal study and work opportunities in their adopted country. These things notwithstanding, the acquisition of international experiences and competencies as well as the choice of work with an international component are on average somewhat more highly rewarded than other study and career options.

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Chapter 8
Winners and Losers

Liv Anne Støren and Clara Åse Arnesen

8.1 Introduction

The preceding chapters look at the outcomes of higher education in European countries, each from a particular perspective. In this chapter we adopt a more holistic view, attempting to determine to what extent particular groups of graduates can be identified as "winners" or "losers" in the labour market. Analyses of labour market successes and failures normally focus on predicting objective measures such as unemployment, overeducation and wages. This chapter will also analyse such factors, which implicitly treat participation in higher education as an economic investment on which both individual graduates and societies as a whole hope to recoup a satisfactory economic return. Given the huge sums invested in higher education, this focus on economic returns to education is understandable and legitimate. However, it is important to recognise that there are other ways of looking at success of graduates in the labour market. What if graduates strive for other things than secure employment with high earnings and succeed in reaching those other goals? Are those graduates not also "winners"? More generally, what makes someone a winner (loser) in one dimension does not necessarily imply that he or she is a winner (loser) in other dimensions as well.

In this chapter we will look at determinants of success and failure on both objective and subjective measures. The indicators of objective success or failure are the employment situation – have graduates managed to secure paid work, and if so, does this match their own attained level and field of higher education? – and the wages earned. The subjective measures concern work values and the realisation of these values and job satisfaction. We will explore to what extent the objective and subjective indicators have similar predictors. In other words, we will explore to what extent these different indicators overlap or not. Moreover, we will explore to what extent objective success predicts success in the subjective dimensions. Attention will be paid throughout the chapter to country differences in terms of success or failure and

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how these differences might be explained, as well as possible gender differences and differences by fields and types of higher education. Before presenting the empirical results, we will briefly outline the foundations on which our analyses are based.

Different forms of education–job (mis)match will be studied as indicators of labour market success or failure: both the most extreme form of mismatch such as unemployment and vertical educational mismatch which refers to the lack of correspondence between the level of the education acquired and the level required in the job. Also a third form of possible mismatch will be studied, which we call horizontal mismatch, that is, working in a job matching one's own level but not one's own field of education. This *may* be a flexible and rewarding way of labour market adaptation, or it might be a situation that is more or less forced upon the individual and represents a kind of mismatch with possibly negative consequences on wages, realisation of work orientations or job satisfaction. The identification of horizontal mismatch is of special interest for our fourth form of mismatch; those being both vertically and horizontally mismatched. This refers to graduate persons holding jobs such as that of a taxi-driver or shop assistant. In addition to labour market match or mismatch, our second objective measure of the extent to which the graduates are successful is *wages*.

Different theories have different explanations of success and failures in the labour market. According to the assignment theory (Sattinger, 1993), the existence of labour market phenomena such as unemployment and overeducation can be motivated as labour market responses to the problem of assigning workers to jobs. Both individuals and jobs can be ranked in terms of skills. Individuals will be ranked according to the skill level they possess and jobs in accordance with the skill level they require. If there are more skilled workers than there are complex jobs, some individuals will end up in jobs for which they are overqualified. This implies that persons with non-matching jobs will be overeducated, have reduced productivity and receive lower wages.

Problems in the education to work transition are often explained by the search theory (Hammermesh & Rees, 1984), which among other things points to a lack of information. Hartog (2000) also points out that the search process takes time and is based on imperfect information, so that unemployment and overeducation may be temporary phenomena resulting from a "waiting room effect". Since we look at the labour market situation five to six years after graduation, we can assume that the impact of any such waiting room effect will be minor. However, initial problems in finding suitable work might have long-lasting effects; thus, theories of "state dependence" may be relevant to explaining the occurrence of unemployment and overeducation. According to such theories (Andress, 1989; Heckman & Borjas, 1980; Heckman, 1981), unemployment experiences early in the career may have negative effects at a later stage. Persons who have experienced previous periods of unemployment, overeducation and the like may have an increased risk of similar problems later in the career as a result of a self-enforcing process.

Although there has been considerable research into overeducation, there has been little attention paid in the literature to the extent to which overeducation – or job–worker mismatches in general – varies by type of education. In this chapter,

mismatch by field of study and other characteristics of the study programme will be taken into account. Green and McIntosh (2002) find that graduates of business and management studies and social sciences have the highest rates of overqualification for their jobs. Heijke, Meng and Ris (2002) examine the role of "generic" or "vocational" competences in the transition to the labour market. They found, among other things, that those with high levels of vocational competences more often had a job within their own educational domain than those with good generic competencies and also that there was a negative wage effect of having work outside one's own domain (being horizontally mismatched).

The human capital perspective is to some extent also compatible with overeducation, for example, when the choice of a low-level job is seen as a good investment opportunity (Hartog, 2000). The human capital theory (Becker, 1964; Mincer, 1974) asserts that workers are paid according to their human capital, but in the case of overeducation, workers will not be paid the full value of their potential marginal product (Green, McIntosh, & Vignoles, 1999, 2002). Empirical research has shown that overeducated workers receive lower wages than appropriately educated workers (Hartog, 2000) and also that human capital factors account for only part of the observed wage variance. For instance, it does not account for gender differences in wages found in many studies. In addition to human capital, social capital (Bourdieu, 1985; Coleman, 1988) may also have an influence on labour market opportunities. This refers to resources situated in social networks.

A job confers both pecuniary and non-pecuniary rewards in the labour market, and most graduates do not strive only for secure work or high wages. Mathios (1989) argues, for example, that when analysing wage differentials among highly educated persons, one should take into account the non-pecuniary factors of a job as well. The analysis of realisation of work orientations which will be undertaken in this chapter is one way to take non-pecuniary factors into account.

8.2 Labour Market Situation – Match or Mismatch

To investigate the labour market situation among the graduates, we have constructed a variable which we call "mismatch". This variable is based on the respondent's self-assessment of his/her job in relation to his/her education. Self-assessment is viewed as the best *available*[1] measure concerning the measurement of education–job mismatch (Hartog, 2000).[2]

[1] A job analyst might do a better job, but self-assessment is the most economic method and it is probably as valid as job analyses because the content of jobs change faster than the available instruments for standard classifications of jobs.

[2] See Hartog (2000), Allen and van der Velden (2005) and van der Velden and van Smoorenburg (1997) for a discussion of methods concerning the measurement of skills and education–job (mis)match.

The graduates are grouped into five categories, ranked in ascending order of presumed severity of mismatch:[3]

1. *Employed with relevant work, that is, no mismatch*.
2. *Horizontally mismatched,* that is, working in a job matching one's own level but not one's own field of education.
3. *Vertically mismatched,* that is, working in a job matching one's own field but not one's own level of education.
4. *Both vertically and horizontally mismatched.*
5. *Unemployed*.

We will investigate the labour market situation at the time of the survey by educational level, and because of this, we will base our analysis on the educational level the graduates had achieved at the time of the survey. We use the label "first-level" for graduates who have completed a programme in higher education (equivalent to bachelors in some countries) *not providing direct access to a doctorate*. We use the term "second level" for graduates who have completed a programme that does *provide direct access to a doctorate*.

The number of observations in the analyses below refers to those who belong to the *labour force*, that is, those who are either employed or unemployed and seeking work. Some 94% of respondents belong to the labour force, varying from 91% in Finland; 92% in the Czech Republic, Austria and the UK; 93% in Estonia; 94% in France and Italy and 95% in Germany to 96% in Switzerland and Spain; 97% in the Netherlands and Norway and 98% in Belgium.

Of those who are in the labour force, 4% are unemployed (weighted average for 13 countries), *73% hold relevant employment* and the rest are either vertically mismatched (9%), both vertically and horizontally mismatched (6%) or horizontally mismatched (8%) according to the definition above. These shares differ a lot by country and level of education, as can be seen below.

8.2.1 Labour Market Situation by Country, Education Level and Field of Study

Second-level graduates are somewhat more often mismatched than first-level graduates, but this applies only to vertical mismatch, which mainly involves lower-level tertiary jobs in the case of second-level graduates, but mostly jobs below tertiary level for first-level graduates. The share of unemployed is the same in both cases (see Table 8.1). Figures 8.1 and 8.2 show how this varies between countries. Those with relevant work are not included in the graphs, to facilitate comparison of the often small proportions in the other categories.

[3] See further definition in Appendix 1.

Table 8.1 Percentage mismatch, total sample, by education level

	Horizontally mismatched	Vertically mismatched	Both horizontally and vertically mismatched	Unemployed
First level	10	5	6	4
Second level	7	11	6	4

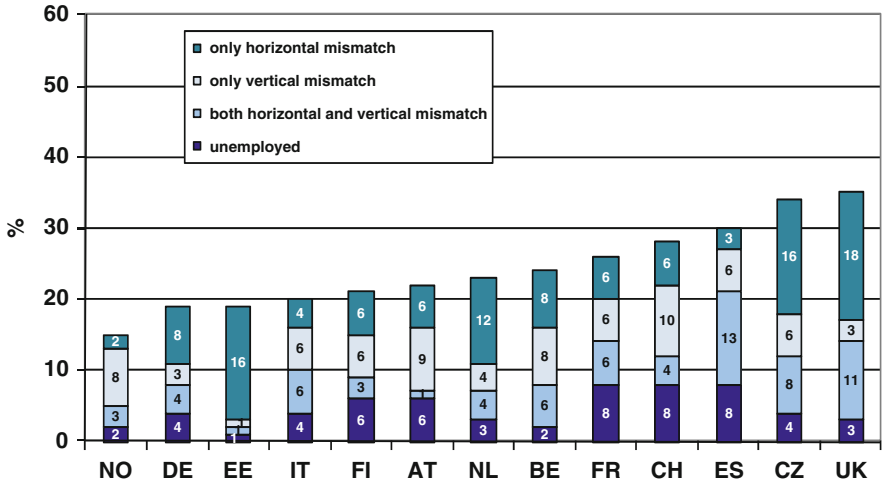

Fig. 8.1 Mismatch at the time of the survey, first-level graduates

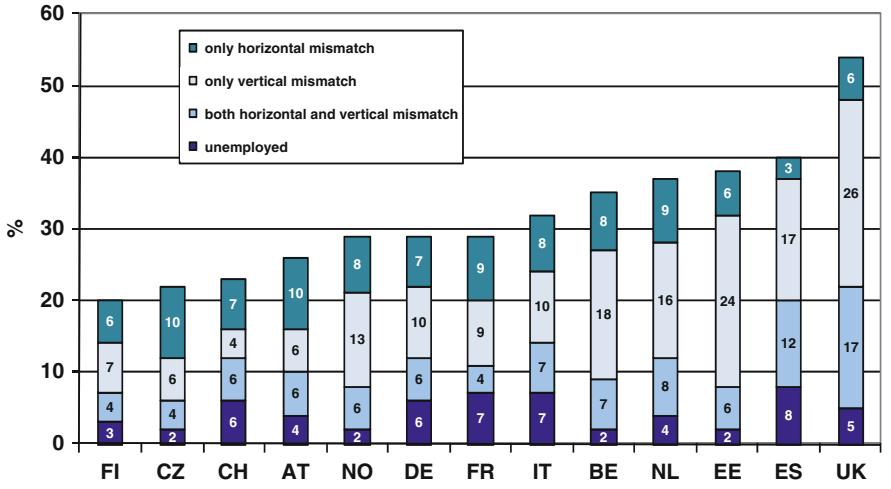

Fig. 8.2 Mismatch at the time of the survey, second-level graduates

Both among the first- and second-level graduates, British and Spanish graduates have higher shares that are mismatched than those in most of the other countries. Finnish and Norwegian graduates are among those with the lowest percentages who are mismatched at both levels, followed by German and Austrian graduates. In other countries, the proportion of mismatches varies between the two levels. Among first-level graduates, both Italian and Estonian graduates have low shares and are mismatched and Czech high shares, while the opposite is the case for second-level graduates.

The *type* of mismatch differs a lot by country. Czech and British first-level graduates are quite often horizontally mismatched, while Spanish graduates more often experience the most severe forms of mismatch, namely, being either unemployed or both horizontally and vertically mismatched. British and Czech first-level graduates also have high shares that are both vertically and horizontally mismatched, suggesting that their high shares of (only) horizontally mismatch may imply labour market problems.

We see that a relatively high proportion of second-level graduates experience vertical mismatch. As remarked above, most of these graduates are less severely vertically mismatched than their first-level peers, holding jobs for which some form of tertiary education is considered appropriate. Some of them have taken further education after graduating in the reference year (in most countries 1999/2000), only obtaining their second level later during the period 2001–2005 (2006). If these graduates are overeducated, this may be due to the fact that they still hold the same position that they held before completing their second-level programme. Table 8.2 shows whether late achievement of second-level degree has an impact of the mismatch variable.

Table 8.2 shows that graduates who received a second-level degree only after the reference year were indeed much more likely to be vertically mismatched than those who already obtained a second-level degree in the reference year. However, even those who received a second-level degree in the reference year were clearly more often vertically mismatched than those with only first-level qualifications. The

Table 8.2 Labour market situation among first- and second-level graduates. Total sample of 13 countries

	Horizontally mismatched	Vertically mismatched	Horizontally and vertically mismatched	Unemployed
First-level graduates	10	5	6	4
Second-level graduates				
Degree obtained after reference year[a]	4	29	9	6
Degree obtained in reference year[a]	8	9	6	4

[a]The year in which the higher-education degree referred to in the questionnaire was obtained (in most countries 1999/2000).

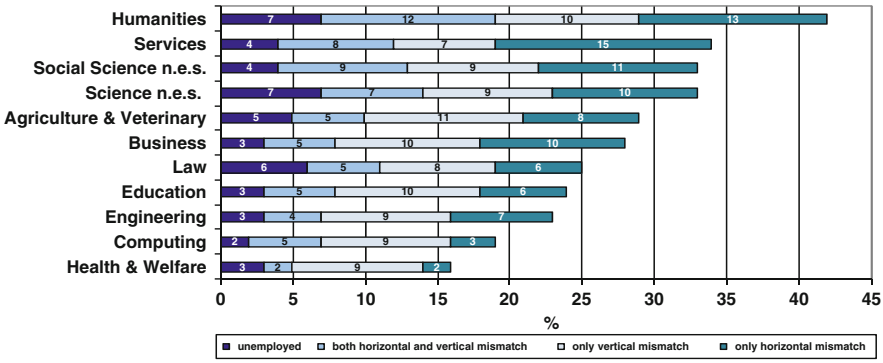

Fig. 8.3 Mismatch by field of study

returns to education for those who increased their qualification level after the reference year do not (yet) fully correspond to their investment in further education.[4] We will later see whether this also applies to their wages.

Figure 8.3 shows how the labour market situation varies by field of study.[5] The chart shows that Humanities and arts on the one hand and Health and welfare on the other constitute the extreme points in terms of overall mismatch. The shares of those who are only vertically mismatched differ very little by field of study, but the proportions of those who are unemployed, both horizontally and vertically mismatched, and especially only horizontally mismatched, vary strongly. The results in Fig. 8.3 also suggest that horizontal mismatches *may* represent something negative (a real mismatch), because those fields that have the highest share of those who are horizontally mismatched (Humanities, Services, Social Science and Science) also have highest shares of other forms of mismatch.

8.2.2 Which Factors Increase the Probability of a Good Match?

We have seen above the results of bivariate relations between education level and field of study and the mismatch variable, based on weighted averages. There are many individual variables that may be important for the chance of experiencing one or more forms of mismatch. In this section, we will explore the effects of such variables, controlling for country differences. This will be done using multinomial logistic regression models, the results of which have been converted into estimated probabilities and presented in graphs. The dependent variable is the mismatch variable described above, with reference category being those holding relevant work, against which the change in odds of each of the four forms of mismatch related to

[4]The proportion of vertical mismatch among this group does not depend on whether the degree was obtained shortly after the reference year or later, around the time of the survey.

[5]Based on a mixture of ISCED broad and narrow fields of study.

various predictors has been estimated. The predictors include demographic variables, educational background variables (field of study, level, grades, vocational study, prestigious study programme, further education) and variables related to the graduates' working career, both during education and after graduation, as well as parents' education and indicators of social network. It is important to note that all estimated probabilities have been controlled for the effects of all other variables. The full results and method used for calculating estimated probabilities are available on request from the authors.

Figure 8.4 shows the effect of study-related work experience during study, having graduated from a prestigious or a vocationally oriented study programme, respectively.

We see that all the three mentioned factors increase the probability of holding relevant work. Although the effects on unemployment, horizontal mismatch, vertical mismatch and both vertical and horizontal mismatch are individually small, they all go in the same direction, so that the cumulative effect on the probability of holding relevant work is quite strong. Study-related work experience reduces all kinds of mismatch, but especially the risk of being both horizontally and vertically mismatched. Graduating from an academically prestigious study programme reduces the risk of being vertically mismatched or both vertically and horizontally mismatched, whereas a vocationally oriented study mainly reduces the risk of being horizontally mismatched or both horizontally and vertically mismatched. The latter result is a confirmation of the results of Heijke et al. (2002), mentioned in the introduction. Below we will look at effects of other variables that might affect the labour market situation, starting in Fig. 8.5 with the effect of gender.

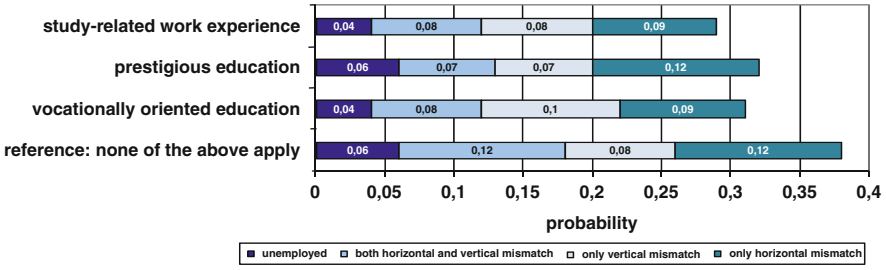

Fig. 8.4 Mismatch by characteristics of study programme and relevant work experience before graduating, estimated probabilities

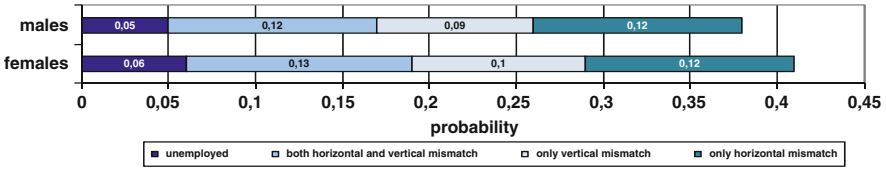

Fig. 8.5 Mismatch by gender, estimated probabilities

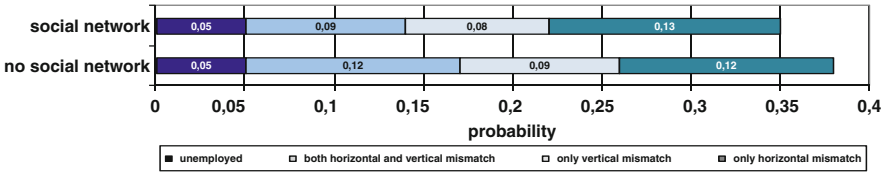

Fig. 8.6 Mismatch by social network, estimated probabilities

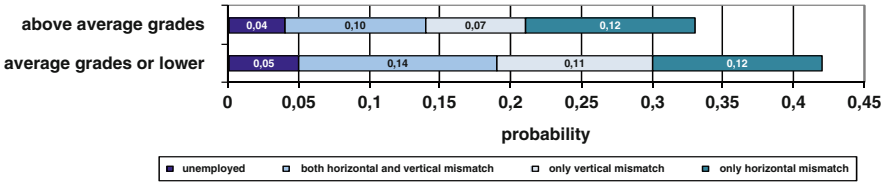

Fig. 8.7 Mismatch by grades, estimated probabilities

Figure 8.5 shows that the difference between male and female graduates is very small, although it is statistically significant. Females have somewhat higher risk of being unemployed or overeducated than males (all other things kept constant). Figure 8.6 shows the effect of a good social network on mismatch.

Having a useful social network also has only a small impact and mainly reduces the risk of being both horizontally and vertically mismatched. Figure 8.7 shows the effect of having above-average grades.

Figure 8.7 shows that getting good grades has a strong effect on the chance of mismatch. Those who report having above-average grades clearly have less risk of being vertically mismatched or both horizontally and vertically mismatched than those who do not report this.

We now turn to the effects of work and unemployment experience since graduation.[6] We should note that in these models we have controlled for whether graduates have followed further education, since this could potentially have a confounding effect on the results. The results of these analyses, shown in Figs. 8.8 and 8.9, therefore, show the net effect of work experience and unemployment experience. The net effect of employment experience may be seen as an effect of acquired human and social capital. Any residual effect of unemployment experience after controlling for employment experience can be interpreted as an indication of state dependence (see Section 8.1).

Although there is an effect both of the amount of work experience and of the duration and number of unemployment spells, the latter seem to have the greatest effect. Figure 8.8 shows that the risk of being unemployed is only 2% among those

[6]Based on an extended model including controls for number of months with unemployment experience and the number of times unemployed. These variables are not included in the other models.

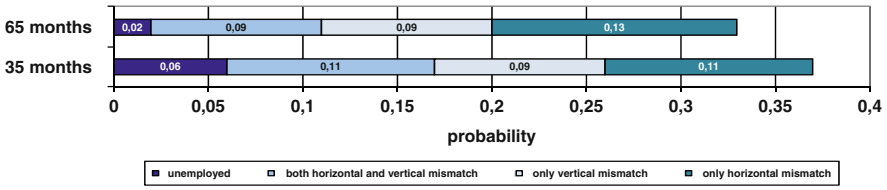

Fig. 8.8 Mismatch at the time of the survey by work experience after graduation, estimated probabilities

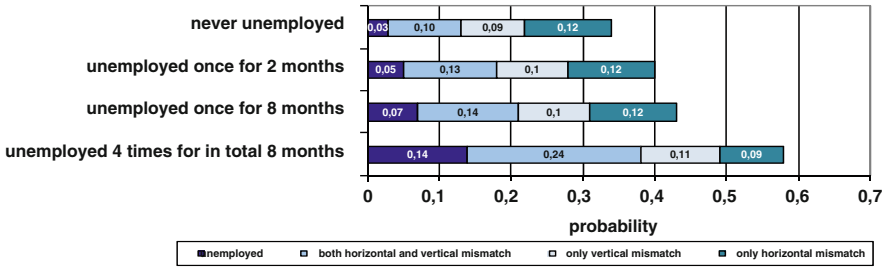

Fig. 8.9 Mismatch at the time of the survey by unemployment experience after graduation, estimated probabilities

with 65 months of work experience, compared to 6% among those with 35 months of work experience. Work experience has little effect on the other forms of mismatch. The strong effect of work experience on the risk of unemployment is almost trivial, since those with more work experience can be expected to have a lower chance of being unemployed at any time since graduation, including the time of the survey.

Similarly, unemployment experience also has a strong effect on the chance of being unemployed at the time of the survey (see Fig. 8.9). Compared to those with no unemployment spells, those with only one unemployment spell with a duration of two months have 2% points higher risk of being unemployed at the time of the survey (5% versus 3%). This chance rises with both the duration of unemployment and the number of unemployment spells. Work and unemployment experience not only affect the chance of being unemployed at the time of the survey but also the risk of being both vertically and horizontally mismatched. Especially the number of unemployment spells appears to have a strong effect on this risk. There is little or no effect of work and unemployment experience on the risk of horizontal or vertical mismatch separately.

These results indicate that problems in the initial phase of transition from education to work may result in more long-lasting problems in getting relevant and stable work for a substantial proportion of graduates due to reduced opportunities for human capital accumulation and/or to so-called "state dependence" (Heckman & Borjas, 1980; Pedersen & Westergard-Nielsen, 1993), as mentioned in Section 8.1. The controls for work experience and unemployment spells also contribute to explaining the country differences depicted in Figs. 8.1 and 8.2. After including

these controls, the effects of the country dummy variables change. For instance, after these controls, Italian and Spanish graduates have a rather low risk of being unemployed, which implies that a considerable part of the country differences shown in Figs. 8.1 and 8.2 is caused by differences in the initial transition phase and early career experiences and by extension by country differences in the general labour market situation.

For brevity's sake, we do not present graphs for all the results of the multinomial regression estimations, but some other results are worth mentioning briefly. Respondents who have (at least one) parent with a higher-education degree have a (somewhat) decreased risk of being vertically mismatched and being unemployed, but the probability of being (only) horizontally mismatched is somewhat increased if one or both parents have completed higher education. This latter result may indicate a greater horizontal flexibility of graduates from higher social strata, possibly with the direct assistance of their relative well-connected parents. Even after controlling for relevant characteristics, graduates who obtained a second-level degree after the reference year have an increased risk of vertical mismatch compared to those who obtained a second-level degree in the reference year and first-level graduates. Similarly, those who obtained a PhD/specialist degree after the reference year have a large risk of being vertically mismatched and also an increased risk of being unemployed. However, those who had obtained a higher-level degree after the reference year are less likely to be horizontally mismatched, suggesting that further education tightens graduates' bonds to their field of study.

8.3 Wages

Wages are the pecuniary reward of being employed. When comparing wages across countries, it is important to take into account that it is not only the wage level that differs but also the cost of living. It could be meaningless to compare wages across countries without taking these differences into account. In order to do cross-country comparisons, we have converted the wages to purchasing power parity (PPP) to correct for the differences in costs of living. One has to keep in mind that this type of adjustment is far from perfect because of the difficulty in finding "baskets" of goods and services that are strictly comparable across countries. Nonetheless, using even an imperfect PPP correction provides a much better basis for comparing wages across countries than no correction at all.

Figure 8.10 shows the hourly wages converted to PPP and Euro for each country. The average hourly wage across all countries is 14 Euros, but the wage level varies a lot between countries.

Broadly speaking, the countries can be divided into three groups, those with the highest wages, the middle group and those with the lowest wages. The figure shows that graduates from Switzerland, Germany and Norway have the highest wages. It is not so surprising that graduates from Switzerland and Norway are on the top, but it is somewhat surprising that wages in Germany are so high. As expected, graduates

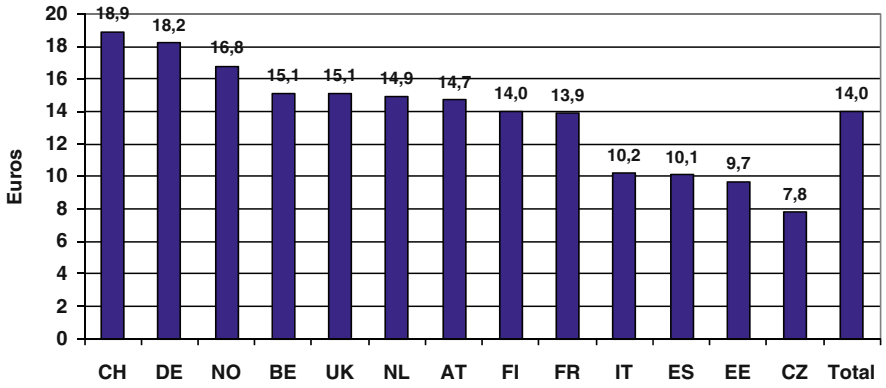

Fig. 8.10 Hourly wages converted to PPP and Euro

from Italy, Spain, Estonia and the Czech Republic have the lowest wages. Graduates from the Czech Republic earn less than half of what graduates from Switzerland do and might be considered as "losers" on this dimension. The middle group consists of graduates from Belgium, the UK, the Netherlands, Austria, Finland and France.

We are interested in factors that have a positive or negative effect on wages. To identify such factors, we have performed regression analyses of the logarithm of hourly wage[7] on a set of explanatory variables.[8] Our main focus is on to what extent gender, human capital–related factors (educational level, field of study, whether the study programme is academically prestigious, grades), mismatch in the labour market and type of job contract have an impact on the graduates' wages. We have performed analyses where we look at all countries together as well as separate analyses for each country. The results of the analysis are summed up in Appendix 2, which shows the percentage change in wages for each of the variables when the other variables are held constant, and the main results are also illustrated in graphs below.

The wage differences between countries remain large after controlling for differences between the country samples with regard to human capital–related variables and other factors that might cause wage differences. This is shown in Fig. 8.11, which shows the controlled and estimated differences between the countries, with the Dutch sample serving as the reference category. The difference between the

[7]The respondents gave information on gross monthly wages in their main job. The monthly wage has been converted to hourly wages by correcting for contract working hours.

[8]We have estimated two models. In model 1, we have included gender, age, relative grades, level of education, field of study, vocationally oriented study, prestigious study programme, relevant work experience before and after graduation, working hour, parents with higher education and position in students or other voluntary organisations is used in model 1. In model 2, we have in addition to the variables already mentioned mismatch variables and a variable indicating whether the job is permanent or not. The regression coefficients and the method for converting the coefficients into percentage wage increments are available on request from the authors.

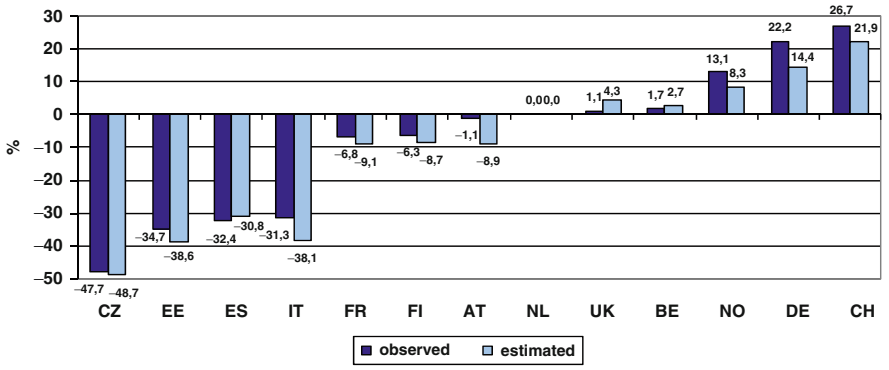

Fig. 8.11 Wage differences between countries, estimated and observed

Netherlands and the high-income countries Switzerland, Germany and Norway is somewhat reduced after controlling for the independent variables; however, the difference is somewhat increased with regard to several other countries (especially Austria, Italy and Estonia).

8.3.1 Gender and Wages

There is a huge literature documenting lower wages among females compared to males. Parts of the wage differentials have been explained by the fact that males and females choose different fields of study, where females choose education that qualifies for jobs with lower wages than do men (Rumberger & Thomas, 1993). In most countries, male-dominated fields of study generally have higher wages than female-dominated fields (Polachek, 1978; Rumberger & Thomas, 1993). Also among individuals with identical education, males and females tend to have different careers. Women tend to be channelled into jobs with lower wages compared to those held by men (Wood, Corcoran, & Courant, 1993). Men have a greater tendency to work in jobs associated with high wages and good career prospects, whereas women tend to work more in jobs that make it easy to combine family obligations and work. In this section, we will examine both whether or not we find gender differences in wages (after controlling for human capital factors) and whether or not there are gender differences in work orientations and the realisation of these orientations.

The general finding that women have lower wages than men is confirmed for the graduates who participated in the REFLEX survey (see Fig. 8.12). In terms of uncorrected ("observed") wages, females earn on average 15% less than males. Although the gender gap varies across countries, females receive lower wages than males in all countries. The differences are smallest in Switzerland and Belgium (5 and 6%, respectively) and greatest in Estonia and France (18 and 20%, respectively). It is important to keep in mind that the figures mentioned refer to the actual observed difference and do not take into account that males and females might have

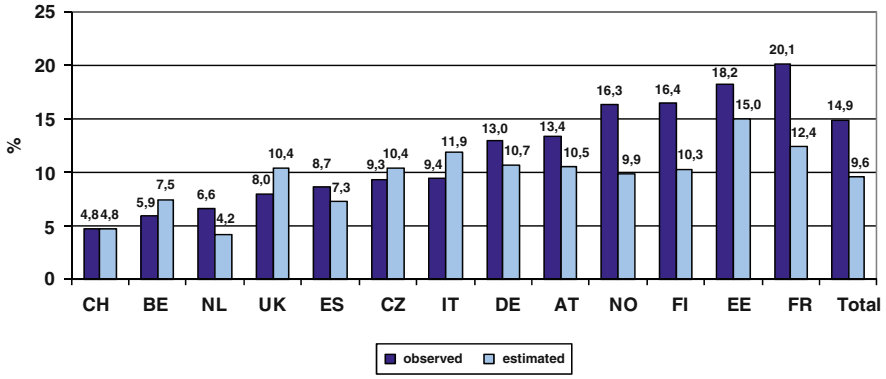

Fig. 8.12 Wage differences between males and females by country

different level of education or different field of study. Females have shorter education than males (are more likely to have a first-level as opposed to a second-level degree), are concentrated in fields of study that pay less and may have less work experience. This might explain some of the wage differences between males and females. Although controlling for factors that might influence the wages reduces the wage gap for females considerably, females still receive significantly lower wages than males ("estimated wages"), about 10% across all countries. Significantly lower wages among females still apply in all countries. The most striking result of controlling for relevant other variables is that the country differences in the gender gap are reduced dramatically. In countries with a small observed gender gap, controlling for other variables makes little differences. In some of these countries (Belgium, the UK, the Czech Republic and Italy), the estimated gender gap is even somewhat higher than the observed gender gap. In contrast, controlling for other variables makes a big difference in most of the countries where the observed gender gap was large. The Nordic countries, which often are considered as leading countries when it comes to equal opportunity policy, have an estimated gender wage gap around the average for all countries. The highest estimated gender gap is found in Estonia. Although the gender gap in earnings varies between countries, we can conclude that women in general might be considered as wage "losers" and men as wage "winners".

8.3.2 Education and Wages

Wages differ both between different levels of education and between different fields of study. Previous research has found that there is a tendency for professionally oriented fields of study such as Business and Engineering to have the highest wages, whereas those in "softer" fields of study such as Humanities have lower earnings (Finnie & Frenette, 2003). This will also be examined below.

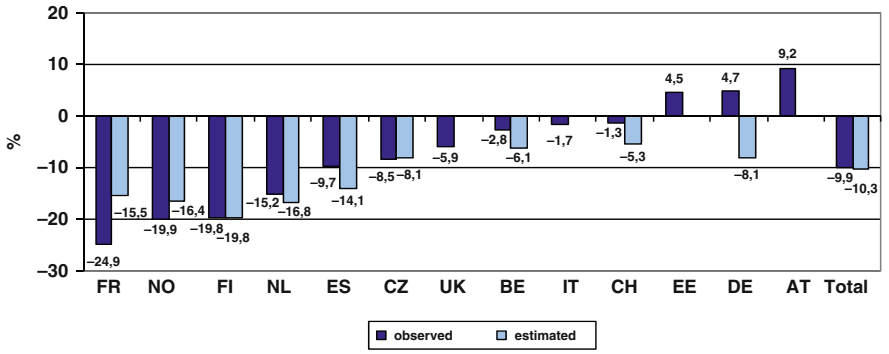

Fig. 8.13 Wage differentials between first- and second-level degree graduates

Another prediction of the human capital theory is that a higher level of education is associated with higher wages. We will now examine to what extent this applies to our graduates as well. Figure 8.13 shows the average difference in wages between first- and second-level degree graduates as a percentage of the wages of second-level degree graduates.[9] Again, the column "observed" is based on the uncontrolled average wages, while the column "estimated" is based on the regression analyses.

If we look at the column "observed", we see, as expected, that the wage level is highest among second-level graduates both in general across all countries as well as in most of countries separately. On average, graduates with a first-level degree have 10% lower wages than those with a second-level degree, but the differences vary a lot across countries. The largest differences between first- and second-level degree graduates are found in France (25%), Norway and Finland (both 20%). Surprisingly, in Germany, Austria and Estonia, graduates with a first-level degree have the highest wages. In Italy, Switzerland and Belgium, the wages among second-level degree graduates are only slightly higher than among first-level degree graduates. After controlling for other variables – including whether or not one has gone on to complete a higher-level degree after 2000 – the country differences become somewhat smaller, but the overall differential remains about the same. The initially large differential in France and Norway is considerably reduced, while the apparent anomaly of higher wages for first-level graduates in Estonia, Germany and Austria disappears (in the case of Germany is even reversed) after controlling for other variables.

Having undertaken further education increases a person's human capital, and we are interested in the degree to which this is reflected in wages. The regression analyses indicate that having undertaken further education results in higher wages. Graduates who gained a first-level degree in the reference year and have

[9]The educational level refers to the level in 1999/2000. We have not taken into account whether the graduate had finished a second-level or PhD/specialist degree during the years from 2000 to the time of the survey in the column "observed". However, in the column "estimated", information on further education is used as explanatory variables.

since completed a second-level degree show an average wage gain of 12% after controlling for relevant other characteristics, including whether they are experiencing a labour market mismatch. The resulting wage is almost in line with those who gained a second-level degree in the reference year. If we do not control for labour market mismatch, the wage gain is smaller (8%), and those who gained their second-level degree after the reference year earn on average 2% less than those with a second-level degree from the reference year. The reason for this difference is presumably that those who raised their qualification level since the reference year are more often newcomers to the labour market and are therefore more exposed to mismatch. The wage gain associated with completing a second-level degree since the reference year is seen in most countries after controlling for mismatch. The exceptions are Italy, Austria, United Kingdom and Estonia. Those who have completed a PhD degree since initial graduation also show a wage gain of 9% after controlling for labour market mismatch. This effect is significant in Italy, Austria, Finland, the Czech Republic and Estonia, varying between 9 and 12%. If we do not control for labour market mismatch, there is in general no wage gain associated with a PhD. The reason is again that those who have completed a PhD are (even more than those with a "new" second-level degree) relative newcomers to the labour market.

As mentioned earlier, wages differ between different fields of study. Previous research has shown that professionally oriented fields of study such as Business and Engineering tend to yield high wages, whereas "softer" fields of study such as Humanities yield lower earnings (Finnie & Frenette, 2003). Figure 8.14 shows the wages by field of study, both before ("observed") and after ("estimated") controlling for relevant characteristics.

If we look at the column "observed" in Fig. 8.14, we see that, in general, graduates in Computing, Engineering and Science have the highest average wages compared to graduates in Social science, while graduates in Agriculture, Education and Humanities have the lowest. These results are mainly in line with results from

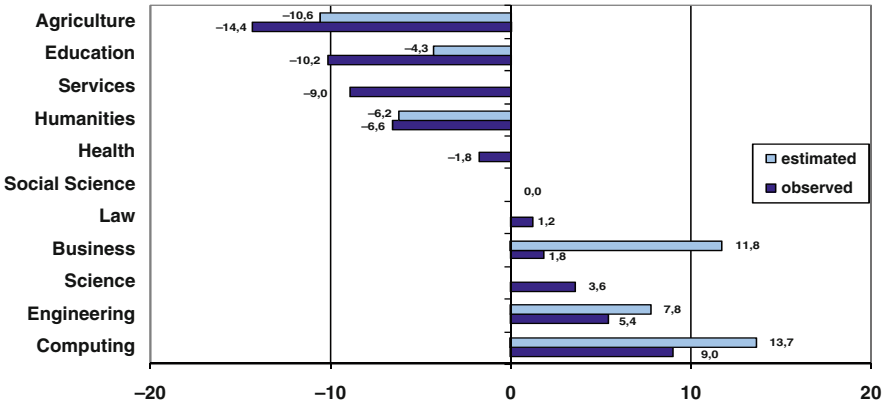

Fig. 8.14 Wage differentials between fields of study (Only significant results shown for estimated wages)

previous research and indicate that graduates in Computing and Engineering are wage winners and graduates in Agriculture and Education wage losers. However, the results are not universal but vary across countries.

The column "estimated" shows that the field of study a person graduates from has impact on his/her wage even after controlling for other factors. The results resemble the differences in observed wages, but there are some notable changes. To some extent, the changes are due to a shift in the relative position of the reference category Social Science: Most fields have improved their wage position vis-à-vis this category. Business and Computing graduates now emerge as clear wage winners, together with Computing and Engineering graduates, and the main losers seem to be graduates in Agriculture and Humanities. Again, there are some differences between countries.

The regression analyses also indicate that those graduating from a prestigious study programme in general have higher wages than those who are not graduating from such programmes (5%). However, this is not the case in Austria, Germany and the Netherlands, where there is no significant effect. The wage gain for the other countries varies between 2 and 12% (the Czech Republic and Estonia, respectively).

8.3.3 Mismatch and Wages

One important objective of this chapter is to study whether those experiencing labour market mismatch are also losers on other outcome indicators such as wages. Figure 8.15 shows the wage differentials between graduates experiencing labour market mismatch and graduates with relevant work.

Those graduates who are *both* horizontally and vertically mismatched seem to be really losers when we look at the uncontrolled average across all countries. They have on average wages that are 24% lower than those in relevant work. After controlling for the other factors that have impact of wages, the wage gap is reduced to 11%, which is still considerable and about the same as for those who are only vertically mismatched. Both groups can therefore be regarded as losers in this respect. Interestingly, controlling for other variables makes little difference for those who are only vertically or horizontally mismatched. The differential is increased slightly in the case of vertical mismatches and even switches from a small negative to a small positive differential in the case of horizontal mismatches. Consequently, the latter group cannot be regarded as losers in this respect.

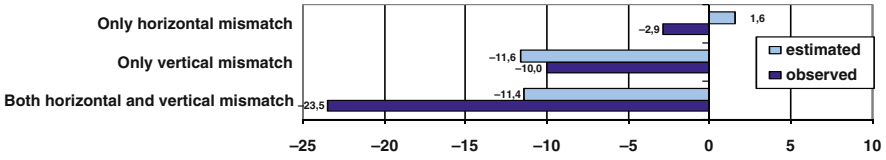

Fig. 8.15 Wage differentials between mismatched graduates and graduates in relevant work

The general pattern of effects is replicated in most countries, with some small differences. The wages for those who are both horizontally and vertically mismatched are not significantly lower than those with relevant work in Italy, the UK, the Czech Republic, Belgium and Estonia where there is no significant effect. The wage loss for the rest of the countries varies between 8 (Finland) and 19% (Norway). The negative effect on wages of being vertically mismatched applies to all countries except for Italy and Estonia and indicates that vertically mismatched persons in most countries are losers. The wage loss varies between 4 (Switzerland) and 17 (Finland). In some countries like Finland, Norway, the Czech Republic and Switzerland, the positive estimated effect of being only horizontally mismatched was substantial, these graduates earning between 4 and 12% more than those not experiencing any kind of mismatch. In contrast, horizontally mismatched graduates earned 8% less than relevantly employed graduates in Spain.

Another simple way to study the relation between mismatch and wages is to see to what extent the wage distribution depends on the status of the mismatch variable. We have distributed the graduates in each country on three different wage groups, depending on whether they were among the bottom 25%, the middle 50% or the top 25%. Table 8.3 shows the relation between mismatch and wage group.

The table shows that half of those who are both horizontally and vertically mismatched have wages among the bottom 25%, whereas a little over one-third of those vertically mismatched fall in the same group. These groups are also less frequently observed among the top 25%. This indicates that the groups are wage losers. Those horizontally mismatched do not deviate much from those who are not mismatched, and the results support the conclusion that the horizontally mismatched should not be considered as wage losers.

8.3.4 Temporary Jobs and Wages

Temporary jobs are often considered as bad jobs because they tend to pay less and because workers in temporary jobs tend to be less satisfied with their job than workers in permanent jobs (OECD, 2002). However, among persons with higher education, prestigious jobs in areas such as scientific research are based on temporary contracts and pay rather modest wages in most countries, indicating that temporary jobs might be quite heterogeneous and not necessarily bad. Figure 8.16

Table 8.3 Mismatch and wages (bottom 25%, middle 50% and top 25%)

	Bottom 25%	Middle 50%	Top 25%
Horizontal mismatch	21.3	53.9	25.0
Vertical mismatch	35.2	47.2	17.6
Horizontal and vertical mismatch	49.8	41.2	9.0
No mismatch	22.7	50.8	26.5
Total	25.4	50.1	24.4

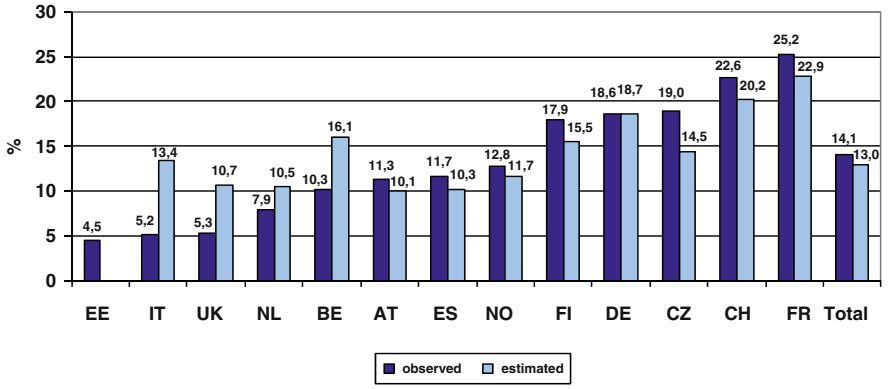

Fig. 8.16 Wage differentials between persons in temporary and permanent jobs, percentage

shows to what extent there are wage differentials between those in temporary and permanent job in our sample. The graph shows that both the uncontrolled ("observed") and controlled ("estimated") wage is higher among those in permanent jobs compared to those in temporary jobs. This is the case in all countries, but the size of the difference differs between countries. The uncontrolled average for all countries shows that those in permanent jobs earn 14% more than those in temporary jobs. The average wage gap is almost unaltered after controlling for other factors that might affect wages, indicating that those in temporary jobs might be considered as wage losers. As Fig. 8.16 shows, the size of the wage differential between those in permanent and temporary jobs varies a lot between countries, with no significant wage differences in Estonia to 23% in France. The differences between countries are somewhat reduced after controlling for other variables.

8.3.5 Other Factors That Have Impact on Wages

Several other factors were included in the wage analyses which are not represented in a graph. Above-average grades increase wages by 3%, and having graduated from an academically prestigious study programme increases wages by a little over 5%. Having at least one parent with higher-education degree increases wages by about 2%. These are net effects for the total sample after controlling for all other variables, and the effects vary across countries.

8.4 Work Orientations

There are good reasons to expect that graduates' satisfaction with their work is determined by a range of different factors. Most of the graduates who participated in the REFLEX survey live in a part of the world that, according to Inglehart, Basáñes,

Díez-Medrano, Halman and Luijkx (2004), is characterised as having a predominantly postmodern character, where the cultural values of the population are more strongly characterised by "self expression values" than by "survival values". Most of the REFLEX countries are advanced industrial societies with high and growing material wealth, "which reduces the basic existential constraints on human choices" (Inglehart et al., 2004:8). Further, according to Inglehart et al. (ibid.), "[T]he rise of a knowledge-based economy makes people intellectually independent, widening the areas in which people have to rely on their own choices."

Nearly all the countries in our sample belong to the part of the world where "self-expression values" *and* secular-rational values (the latter as opposed to traditional values) are highly important. However, there are also differences between our countries that may be of interest. All participating countries except Estonia and the Czech Republic can be characterised as relatively high-income countries. Norway, Germany, Estonia and the Czech Republic can be characterised as the countries that are most marked by secular-rational values, while Spain and Italy are the least secularised (Inglehart et al., 2004). The Netherlands, Norway, Austria, Switzerland and the UK are the countries that are most characterised by self-expression values and Estonia the least. If we consider self-expression values and secular-rational values together, Norway and the Netherlands are the two countries that have the highest combined scores and Spain and Italy (especially Spain) the lowest. This may be due to differences in cultural heritage and also to some degree due to differences in countries' economic development and situation during the last century. The differences between the high-income countries are, however, not large, because, as Inglehart et al., 2004, p. 13) say, "[A]ll high income countries rank relatively high on both dimensions" and "economic development seems to push societies in a predictable common direction, regardless of their cultural heritage".

Another, related, way of studying work values is by contrasting "extrinsic" and "intrinsic" work values (Wang, 1996, in Farag & Allen, 2003). Extrinsic work orientations are related to survival (pecuniary returns, career prospects, cf., survival values mentioned above), while intrinsic values are things that employees seek from their work activities to satisfy their "higher-order needs" (Maslow, 1954) such as autonomy, interesting work, use of skills and knowledge, variety and social needs (Farag & Allen, 2003), compare the "self-expression values" mentioned above.

Later in this chapter we will see whether such a dichotomisation is meaningful when we examine the response to questions of work values in the REFLEX survey, and we will see to what extent these types of values differ between our country samples and between females and males. We will also investigate the extent to which work orientations are realised and look at whether this influences the graduates' job satisfaction.

8.4.1 Factor Analyses of Work Values

The REFLEX questionnaire contains ten questions pertaining to work orientations (values), with answers on a five-point scale indicating the extent to which the

Table 8.4 Work values, results of factor analysis

Values	Career/status (Factor 1)	Professional/innovative (Factor 2)	Social/family (Factor 3)
Work autonomy	–0,018	0,565	0,087
Job security	0,384	–0,123	0,532
Learn new things	0,177	0,754	0,088
High earnings	0,820	0,025	0,067
New challenges	0,310	0,735	–0,132
Good career prospects	0,743	0,319	–0,061
Leisure activities	0,130	0,010	0,691
Social status	0,609	0,089	0,238
Useful for society	–0,121	0,441	0,515
Combine work with family tasks	0,018	0,092	0,758

Note: The Czech sample is not included in the analyses, because of lack of information on some of the items. Only graduates who gave valid responses to all ten items have been included.

respondent attached importance to each items. Respondents were also asked to indicate to what extent these aspects apply to their current work. The first set of questions on values has been clustered into a smaller set of items using the method of factor analyses. Table 8.4 shows the results of the factor analysis.

The factor analysis of work values clearly distinguishes three types of work orientations, namely: Factor 1: career and status orientation (19% of item variance[10]), Factor 2: professional/innovative (flexible) orientation (17.5%) and Factor 3: Social/family orientation (17%). The three factors thus account for 53.6% of the total variance in the ten items.

This clustering of values fits quite well with the characterisations of values based on Inglehart et al. (2004) and Wang (1996) mentioned above. Factor 2, "Innovative/professional", contains the values "work autonomy", "new challenges" and "opportunity to learn new things" and thus covers the "self-expression values" of Inglehart and the "intrinsic" values of Wang. Factor 1, "Career/status", is comparable to Inglehart's "survival values" and Wang's "extrinsic" values. Factor 3 can be viewed as a combination of the two dimensions, whereby "job security" can be seen as an extrinsic/survival value, and "combining work and family tasks" and "Leisure activities" as extrinsic when viewed from the point of view of work and career, but possibly more intrinsic when viewed from the point of view of life values in general.[11] "Useful for society" should probably be seen as an intrinsic (self-expression) value spanning both work and life in general.

Figure 8.17 shows how the factor scores differ between countries. For clarity of presentation, the scores have been converted such that the value 0 represents the

[10]Percentage of variance based on rotation sums of squared loadings.

[11]Farag and Allen (2003) take the former view, because these values are not related to work as such. However, these kinds of values may *also* be interpreted as "post-modern self-expression" (and as such intrinsic values) to satisfy "higher-order" psychological needs.

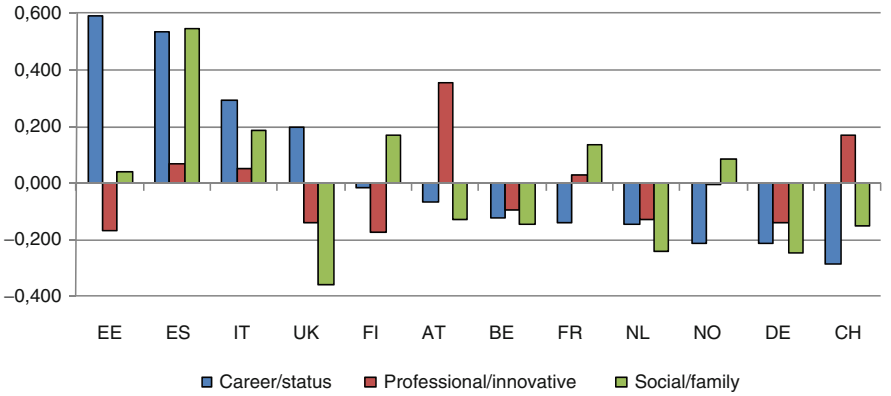

Fig. 8.17 Mean factor scores by country, career/status, professional/innovative and social/family-oriented values

average score for the total sample of 12 countries for each of the three dimensions. Those with positive values score above the average on the dimension in question, those with negative values score below the average.

The results show that Estonian and Spanish graduates score far above average on Factor 1 (Career/status orientation). Italian graduates also score above average on this factor. This fits well with the position assigned to Spain, Estonia and Italy in Inglehart et al.'s (2004) cultural map mentioned in the introduction. It also fits well with the results in Fig. 8.10, which showed that these three countries were among those with the lowest wages. Interestingly, the UK also scores above average on this factor. Switzerland and Germany, the two countries with the highest wages, score below the average on the career factor.

When it comes to Factor 2 (Professional/innovative values), the country differences are much smaller; such orientations seem to be common values that are shared by the vast majority of respondents. Only Austrian and Swiss graduates score clearly above average on this value. These results do not show any clear relation with Inglehart et al.'s cultural map.

In terms of social/family values, the clearest difference in Fig. 8.17 is that between Spanish graduates on one hand and British graduates on the other, the Spanish sample scoring especially high and the British rather low. In general, there seems to be a rough (but far from perfect) correspondence in the position of the countries according to Factor 1 and Factor 3. This might lend weight to the notion that both dimensions represent predominantly "extrinsic" (survival) values.

There are gender differences in addition to country differences in work orientations. This is shown in Figs. 8.18, 8.19 and 8.20. Figure 8.18 shows the relative level of career/status orientations for men and women.

In general, the country differences apply both to males and females. In most countries, males score higher than females. It is conceivable that the lower weight put on career and earnings by women may partly explain the gender wage differentials seen in Fig. 8.12. However, it is noticeable that the strongest differences

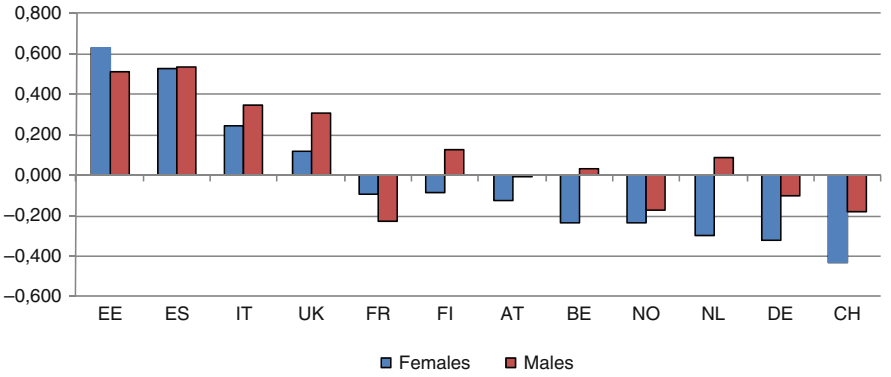

Fig. 8.18 Career/status orientations. Mean factor scores, males and females by country

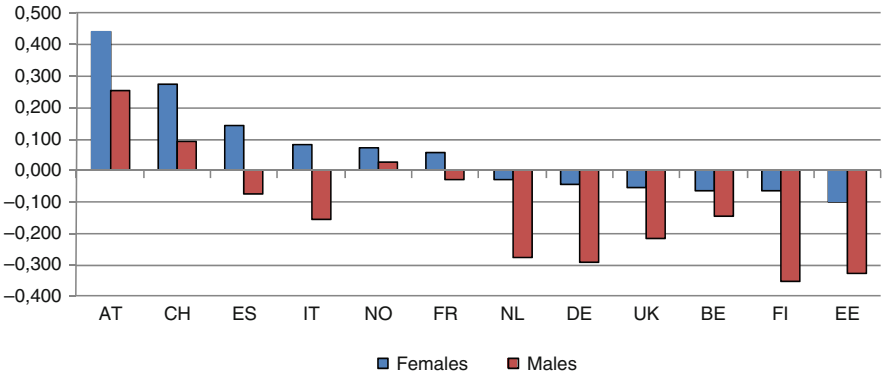

Fig. 8.19 Professional/innovative orientations. Mean factor scores, males and females by country

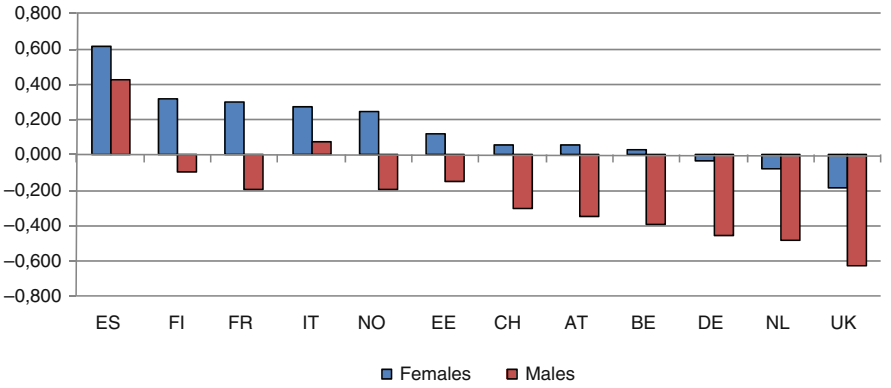

Fig. 8.20 Social/family orientations. Mean factor scores, males and females by country

between women and men can mainly be observed in countries where the gender wage differential is low, especially Switzerland, the Netherlands and Germany. Conversely, France and Estonia, which show the strongest gender wage differentials, are the only countries where males score lower than females. This pattern cannot be explained in terms of an effect of career orientation on earnings and is, in fact, more consistent with an effect of earnings differences on career orientations. It may be that, although women are generally less focused on career success than men, this becomes more of an issue for them when they experience a stronger wage disadvantage vis-à-vis men. We will return to this issue later in this chapter.

When it comes to Factor 2, Professional/innovative orientations, the pattern is again similar for men and women, but women now score considerably higher in all countries than men (see Fig. 8.19). The gender difference is largest in Finland, the UK, the Netherlands and Estonia. The results indicate that males are more driven by extrinsic values than females and that females are driven more by intrinsic values than males.

The results for Factor 3 (Social/family orientations) show large gender differences, with females scoring much higher than males in most countries (see Fig. 8.20). Despite this, the pattern of country differences is quite similar for males and females.

8.4.2 Three Types of "Winners" and "Losers"

The existence of distinct kinds of work values suggests that there may be three types of winners or losers, depending on whether or not the values are realised in the graduates' current job. We investigate this by examining the graduates' responses to the items that refer to the extent to which these aspects actually apply to their work. It is important to note that simply realising or not realising a given work value does not necessarily make one a winner or a loser. Only graduates who have indicated that they find the cluster of items important or very important[12] and that the items in question have either been realised to a fairly high extent (winners) or hardly or not at all (losers). The precise definition of winners and losers is outlined in Appendix 3. Table 8.5 shows the *total* distribution of the three types of winners and losers.

Almost three quarters of the sample are winners on at least one of the three dimensions. Only 7% are winners on all three dimensions. Most of the "winners" are winners on the dimension "professional/innovative" (new challenges, learn new things, work autonomy), while the career dimension (high earnings, good career prospects, social status) has the lowest share (21.5%).

[12]Most of the respondents found at least one of the items connected to one of these three dimensions important or very important. Of those who had answered all the questions concerning work values, 82% found the career values important (at least one of the career items), 97% found the social values dimension (at least one of the items) important and 98% found the professional/innovative dimension important. Only 0.2% did not find any of the dimensions important, and 79% found all the three dimensions important.

Table 8.5 Types of winners and losers, percentage of total response[a]

Winner *Career/status*	21.5
Winner *Social/family*	29.5
Winner *Professional/innovative*	61.9
Winner on all *three* dimensions	7.2
Winner on *two* of the dimensions	34.6
Winner on *one* dimension	31.9
Loser on all *three* dimensions	0.4
Loser on *two* dimensions	3.3
Loser on *one* dimension	11.9

[a]Only observations with a valid response to all ten items on both sets of work value questions are included. The results are based on a weight that gives all the country samples the same size (that is 2,000 graduates) and N is based on this weight.

There are few losers. Only 16% can be classed as a loser on at least one dimension, and most of these are only a loser on one dimension. Less than a half percent can be categorised losers on all three dimensions. Those who are neither losers nor winners are categorised as "neutral", and large proportions of graduates are in this group. Especially on the career dimension and the social values dimension, there are large proportions of "neutrals".

8.4.3 Realisation of Work Orientations by Gender

The gender distribution of the three groups differs somewhat. There is a clear predominance of females among the winners in the social-values group, and a slight predominance of males among the winners on the career dimension, as shown in Fig. 8.21.[13] There is no gender difference in the realisation of professional/innovative orientations.

In Section 8.4.1, the possibility was mentioned that gender wage differences may be partly due to a difference in work orientations. We saw in Fig. 8.18 that women are usually less career-oriented than men. To establish whether gender wage differences are partly due to a difference in work orientations, an additional wage analysis has been conducted in which the effect on wages of the subjective measure "finding high earnings important or very important" has been estimated for men and for women. The result is shown in the Fig. 8.22.

The graph indicates that those who find high wages important *do* obtain higher wages but that the effect is much stronger for men than for women. In fact, women who find high earnings important earn just 1% more than men who do not find high earnings important. This result does not seem to be consistent with the idea that

[13]These gender differences are statistically significant after control for relevant background variables (detailed results available on request from the authors), and based on such regressions, the probability of being a career winner is estimated to be 4% points less among females than males (the same as in bivariate relationship in Fig. 8.21).

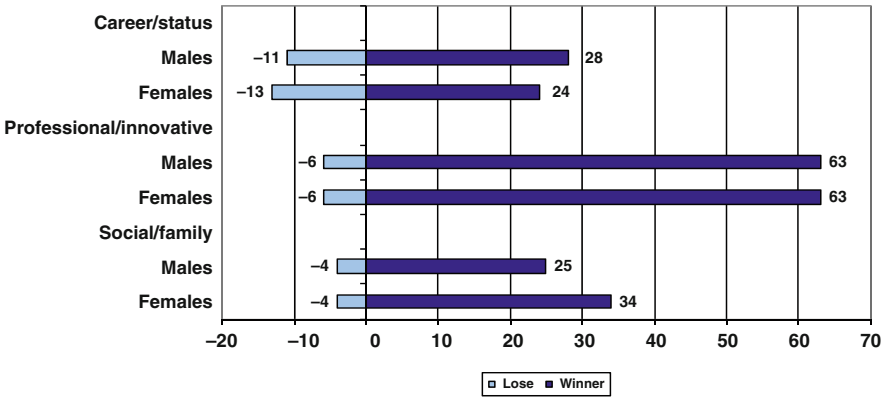

Fig. 8.21 Realisation of work values. Winners/losers on three dimensions, by gender

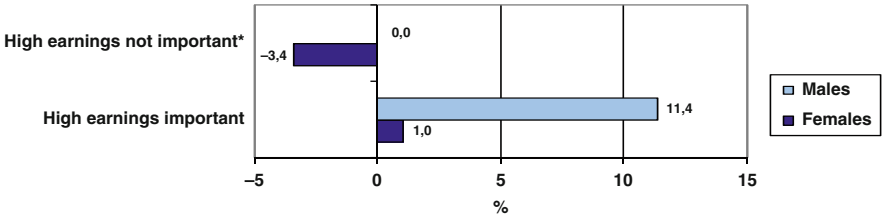

Fig. 8.22 The effect on wages of finding high earnings important, by gender. *Males not interested in high earnings are the reference category

gender differences in work orientations may explain gender differences in wages. However, as remarked earlier when comparing Figs. 8.12 and 8.18, it is conceivable that strong career orientations of women sometimes arise in response to a perceived wage disadvantage. This would make it difficult to draw any firm conclusions from Fig. 8.22.

8.4.4 Realisation of Work Orientations by Country and Field of Study

We now turn to country differences in the proportions of winners and losers on each. Table 8.6 shows this.

Three of the most career-oriented countries, Estonia, Spain and the UK, have higher shares of winners on the career dimension than the other country samples. Interestingly, Spanish graduates are also more often losers on this dimension than graduates in most other countries, highlighting the high salience of this dimension in that country. As we have seen from Fig. 8.10, the Spanish and the Estonians are anything but winners in terms of actual wages. This suggests that graduates' subjective experience of being winners depends more on how they fare compared to

Table 8.6 Winners/losers by country. Realisation of career orientations, professional orientations and social values orientations

	ES	IT	FR	CH	AT	DE	NL	BE	UK	NO	FI	EE
Career/status orientations (N=15,680)												
Winner	34	19	22	22	27	20	24	24	31	21	18	43
Neutral	50	60	64	68	61	67	68	69	59	69	68	49
Loser	16	21	15	10	12	13	8	7	10	10	14	8
Professional/innovative orientations (N=18,602)												
Winner	56	51	55	67	73	65	60	63	61	68	67	64
Neutral	33	41	38	28	23	30	32	32	33	28	28	32
Loser	11	9	7	5	5	6	7	5	6	4	5	4
Social/family orientations (N=18,344)												
Winner	36	23	34	24	27	21	33	30	24	40	34	35
Neutral	56	69	62	72	70	76	66	66	73	58	63	62
Loser	8	8	4	4	3	3	1	4	3	2	3	2

Note: Those who did not find the orientation in question important are excluded from the calculation.

lower-educated workers in their home country than on a comparison with graduates in other countries. A similar story may apply in the three high-income countries Switzerland, Germany and Norway, which do not stand out as having high percentages of those who report being career winners (in fact the percentages are rather low). The country with fewest winners and most losers is Italy.

The country differences in the realisation of professional/innovative orientations are less striking. Italian and Spanish graduates more often see themselves as losers on this dimension and together with the French are less likely to see themselves as winners. Austrians are clear winners in this respect, followed by Norwegian, Swiss and Finnish graduates.

The extent to which social/family-orientated values are realised differs a lot between countries. There are very few losers in any of the countries on this dimension, but also not a very high proportion of winners. The Norwegians have the highest share of winners, followed by Spain. These countries fared best across the three dimensions, with Spanish graduates having a high share of winners on both the career dimension and the social-values dimension and Norwegian graduates on professional/innovative orientations and social/family values. Germany has fewest winners, tightly followed by Italy, which fares quite poorly on all three dimensions.

We now turn to differences in the realisation of work orientations by field of study. Table 8.7 shows these differences.

Those educated in Business and in Law are the main winners in terms of career orientations. Graduates in the field of Education are most often losers on this dimension. It is interesting to note that those educated in Computing are not among the clear winners on the career dimension, despite their favourable position in terms of wages. This may have something to do with expectations.

Table 8.7 Winners/losers by field of study. Realisation of career orientations, professional orientations and social values orientations

	EDU	HUM	SOC Rest	BUS	LAW	SCI Rest	COMPUT	ENG	AGR+VE	HE+WEL	SER	TOT
Career/status orientations (N=15,680)												
Winner	21	21	26	34	31	23	25	26	21	23	26	26
Neutral	63	67	62	57	58	64	65	63	65	65	61	62
Loser	16	13	12	9	11	12	10	11	14	12	13	12
Professional/innovative orientations (N=18,602)												
Winner	64	61	64	60	64	67	68	63	61	63	57	63
Neutral	30	32	30	33	31	28	27	32	37	31	36	31
Loser	6	7	6	7	5	5	6	5	3	6	7	6
Social/family orientations (N=18,344)												
Winner	48	31	31	25	28	27	23	21	26	37	38	30
Neutral	51	66	65	71	67	68	74	74	71	60	59	66
Loser	2	4	4	4	5	5	3	5	3	3	3	4

Note: Those who did not find the orientation in question important are excluded from the calculation.

When it comes to the professional/innovative dimension, there are only quite small differences by field of study. The differences are greater on the social/family dimension. Education graduates are far more often winners on this dimension than the other groups,[14] while those educated in Computing, Engineering and Business are less often winners.

8.4.5 Realisation of Work Orientations: Which Factors Increase the Probability of Being a Winner?

In this section, we discuss the results of a series of multinomial regression analyses in which the effect of various factors on the probability of being a winner or a loser on the three dimensions described above has been estimated. We start by looking at the effects of characteristics of the study programme, achieving above-average grades and having a useful social network. These results are shown in Fig. 8.23.

Prestigious education has the largest positive effect on the probability of being a *career* winner, increasing this from 23% *(the reference group*) to 31%. Having a good social network is also clearly helpful in this respect, while having followed a vocational study programme and achieving above-average grades only have rather modest effects. All these variables mainly affect the probability of being a winner rather than that of being a "loser", although having graduated from a prestigious study programme does decrease this chance by 2% points.

Having a useful social network has the largest effect on the probability of being a winner on the *professional/innovative* dimension, increasing this probability from 59 to 69%. There is also a clear effect of graduating from a prestigious study programme (65%), but again achieving good grades and having followed a vocationally oriented study programme have only rather modest effects. Again, these variables mainly affect the probability of being a winner rather than the risk of being a loser.

The results of the analysis of the third dimension, *social/family* oriented values, are very different from those of the other two. Only graduating from a vocationally oriented study programme has a significant positive effect on the probability of being a winner on this dimension, and this effect is quite small. None of the variables affect the risk of being a loser on this dimension.

We have also investigated whether *educational level* has an effect on the chance of being a winner or a loser on any of these dimensions. The results – not shown in a graph – show that, compared to second-level graduates, being a first-level graduate increases the risk of being a loser on the career dimension but has no significant effect on the probability of being a winner. Interestingly, those who have gone on to attain a PhD or specialist degree also have an increased risk of being loser on the career dimension, and again there is no significant effect on the chance of being a career winner. By contrast, this group has an increased chance of being a

[14] Additional analysis also shows that the social values dimension is particularly important for this group.

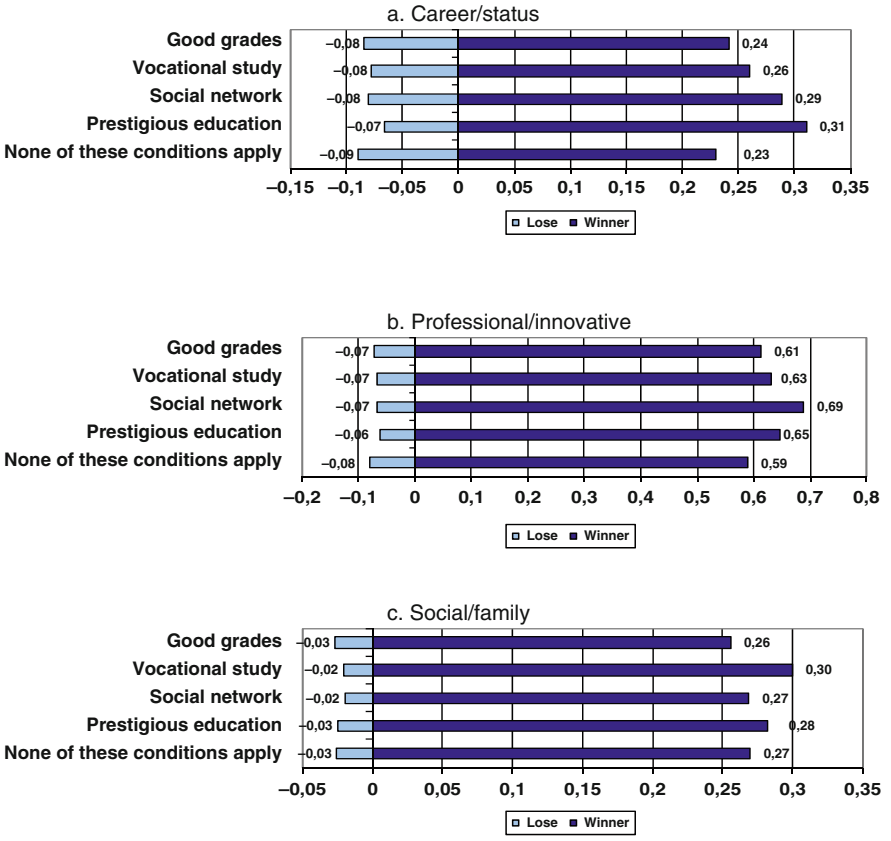

Fig. 8.23 The effect of study programme characteristics, grades and social network on the probability of being a winner/loser. Three dimensions of work orientations

winner on the professional dimension, but a reduced chance to be a winner on the social/family-values dimension.

8.4.6 Winners and Losers by Job Characteristics and Labour Market Situation

It is also of interest to see how the chances of being a winner or loser on these three dimensions is related to characteristics of the graduates' labour market situation and job characteristics. To examine this, additional analyses have been conducted. The main results based on these analyses are presented in Figs. 8.24, 8.25 and 8.26.[15]

[15] Detailed results available on request from the authors.

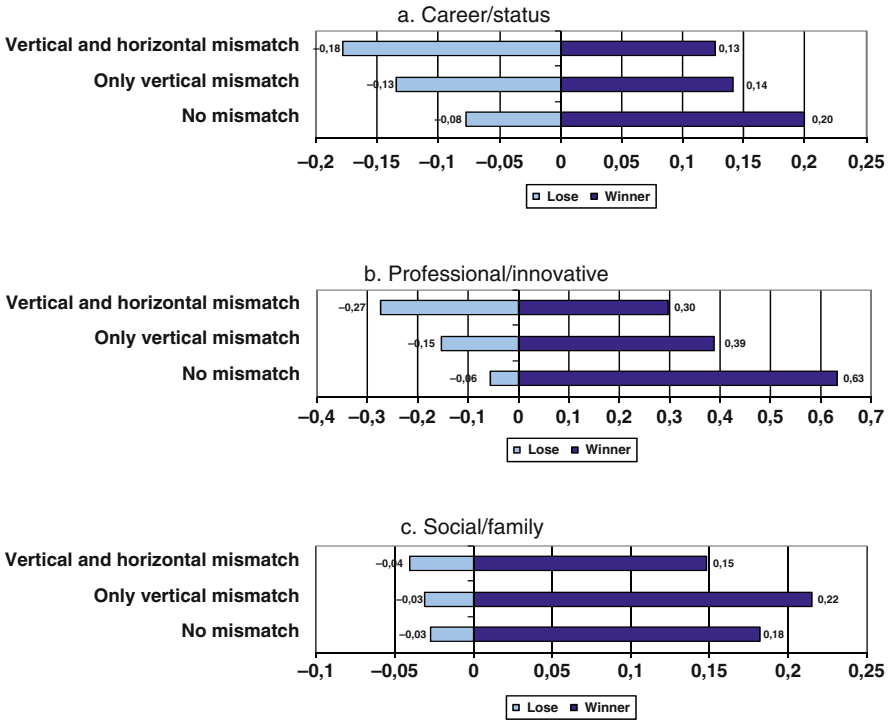

Fig. 8.24 The effect of mismatch on the probability of being a winner/loser. Three dimensions of work orientations

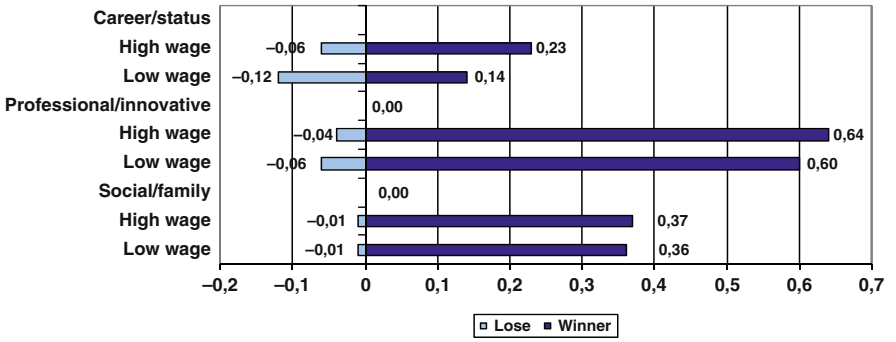

Fig. 8.25 The effect of wage level on the probability of being a winner/loser. Three dimensions of work orientations

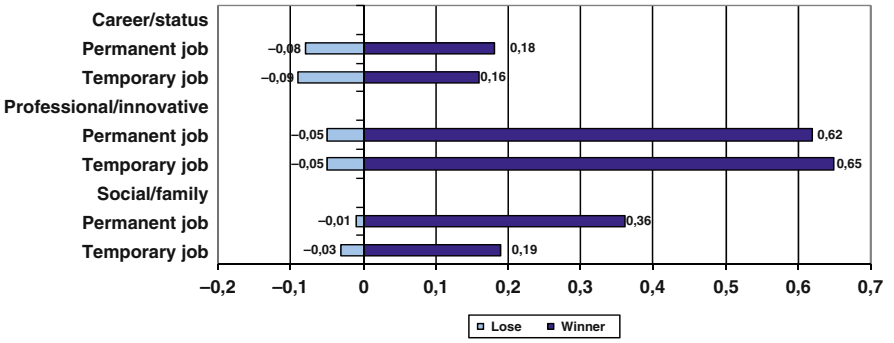

Fig. 8.26 The effect of contract type on the probability of being a winner/loser. Three dimensions of work orientations

Being both horizontally and vertically mismatched has a large negative effect on the probability of being a winner for *all* three winner categories and a correspondingly positive effect on the risk of being a loser on the career[16] and professional dimensions. It seems that being a "loser" on objective measures of labour market position also to a very large extent implies being a "loser" on these two subjective indicators.

Being (only) vertically mismatched strongly reduces the chance of being a winner on the career and professional dimensions. For the third dimension, the social-values dimension, being vertically mismatched has no negative effect on the probability of being a winner on this dimension, and even has a small positive effect. It may be that some graduates prefer a less demanding work situation because this makes it easier for them to combine work with family tasks.

Figure 8.25 shows the effect of wages on the probability of being a winner/loser on the three dimensions.

High wages have a strong effect on the probability of being a career winner. Wages also have some impact on the probability of being a winner or a loser on the professional dimension, but the effect is not very strong. The impact of wages on the social-values dimension is negligible.

Figure 8.26 shows the effect of having a temporary versus a permanent contract on the chances of being a winner or a loser on the three dimensions.

Having a permanent versus a temporary job is mainly important for the chance of being a winner or a loser on the social-values dimension. Having a permanent contract almost doubles the chances of being a winner on this dimension (36% versus 19%) and clearly reduces the (already small) chance of being a loser. Since this dimension consists among other things of an indicator of subjective job security, this is not surprising. The type of contract only has rather modest effects on the other

[16]In the regressions on which the estimates are based, we have also controlled for wages. This reduces the effect of being mismatched on the career dimension but has little impact on the other two dimensions.

two dimensions, whereby the most striking result is that having a temporary contract appears to increase the chance of being a winner on the professional dimension. In reality this is almost certainly a case of a spurious correlation, whereby scientists and related professions are more likely to be winners on this dimension but enjoy less job security on average than those working in other occupations.

Summing up, the most important determinants of being a winner on the professional dimension are having a good match between education and work and having useful social network. Being a winner on the career dimension depends mainly on wages and graduating from a prestigious study programme, while a permanent job is the most important factor determining success on the social-values dimension. In the next section, we will see to what extent such factors have an impact on graduates' *job satisfaction.*

8.5 Job Satisfaction

Farag and Allen (2003) point out that "there are a number of factors or dimensions of work orientations and their realisation which may need to be taken into account when looking at the determinants of an individual's job satisfaction". In this section, we look at the effects of a range of factors on job satisfaction, including the aspects dealt with in the previous section. Figure 8.27 shows the proportion of graduates per country who are satisfied or very satisfied with their current job.

Austria, Norway, Belgium, Estonia, Switzerland and the Czech Republic show relatively high levels of job satisfaction, while Italy and Spain have the lowest shares. It is not surprising that these two countries score lowest on job satisfaction, since they were not among the winners according to objective criteria, although Spanish graduates did score strongly on the subjective social-values dimension and the career dimension.

One of Farag and Allen's (2003) findings was that "intrinsic and social orientations were more important as determinants of overall satisfaction than (other)

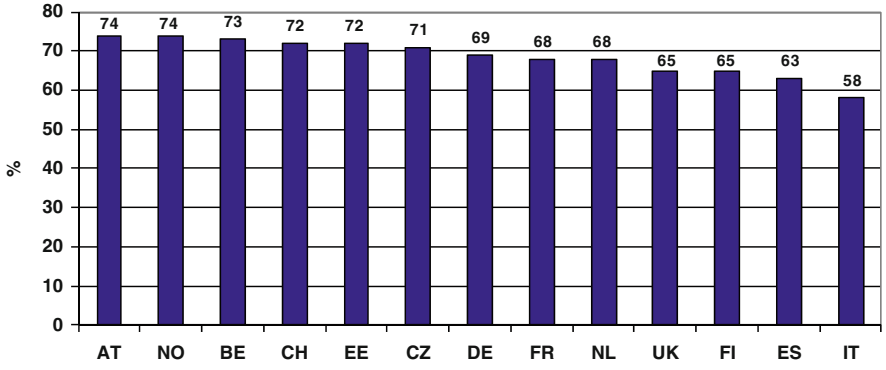

Fig. 8.27 Percentage satisfied with their job, by country

extrinsic orientations". This was in accordance Maslow's hierarchy of needs, which, as Farag and Allen (2003) put it, "leads to the expectation that intrinsically motivated individuals will tend to be more satisfied with their work than extrinsically motivated individuals, since intrinsic motivations will only arise once the (lower order) extrinsic needs have been sufficiently satisfied." Below (Fig. 8.28), we will illustrate the effects of being winners/losers on the three dimensions described above on the probability of being satisfied with the job. The graph is based on separate analyses for the three low-income country samples (Estonia, Italy and Spain) and for the nine high- or medium-income countries. The reason for separating the countries into two groups is to see whether the intrinsic values are less important for job satisfaction in the low-income countries than in the high- or medium-income countries.

In both types of countries, those who are winners on the professional/innovative dimension are most often satisfied with their job, followed by winners on the career dimension and close behind winners on the social-values dimension. However, both the professional dimension and the social values dimension are more important for job satisfaction in the nine medium- or high-income countries than in the three low-income countries (cf., the difference between the winner and loser categories is largest in the high- or medium-income countries), whereas winning or losing on the career dimension has more or less the same effect in the two types of countries. This suggests that intrinsic values are indeed (somewhat) more important in the high- or medium-income countries than in the low-income countries.

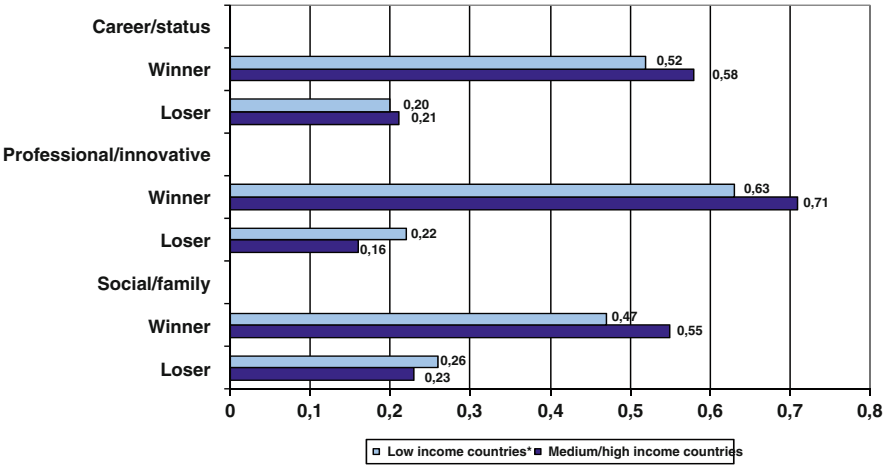

Fig. 8.28 Estimated probability of being satisfied with the job. Effects of being a winner or loser on the career dimension, the professional dimension and the social-values dimension.
The reference category for the estimates in the graph has relevant work and median income (i.e., 9.5 and 15.3 Euro per hour (ppp converted) in the low- and medium-high-income countries, respectively), is a male, Dutch (in high- or medium-income countries) or Italian (in low-income countries) with average age, educated in Law, works in the private sector in a permanent job.
∗Estonia, Italy and Spain

Do we find differences in effects on job satisfaction between low- and high-income countries also when it comes to other aspects of work? Figure 8.29 shows the effect of wage level on satisfaction.

We see that although the wage level has a clear effect in both groups of countries, it has a much larger impact on job satisfaction in the low-income countries than in the other nine countries.

Figure 8.30 shows the effects of the match between education and job.

Being mismatched has a large impact on job satisfaction in both types of countries. Especially being both horizontally and vertically mismatched is related to much lower levels of job satisfaction. Being only horizontally mismatched has a negative effect in the nine high- or medium-income countries, but has no effect in the three low-income countries.

Figure 8.31 shows the effects of working in the public versus the private sector.

From Fig. 8.31, we can see that those who work in the public sector are somewhat more satisfied with their work than those working in the private sector. This applies especially in the low-wage countries. This may be related to the greater job security afforded by the public sector, a feature of work that is more salient in low-income

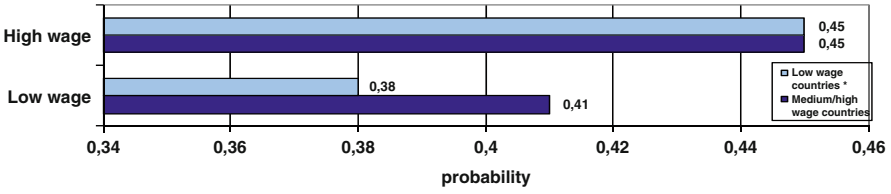

Fig. 8.29 Estimated probability of being satisfied with the job. Effects of wage level

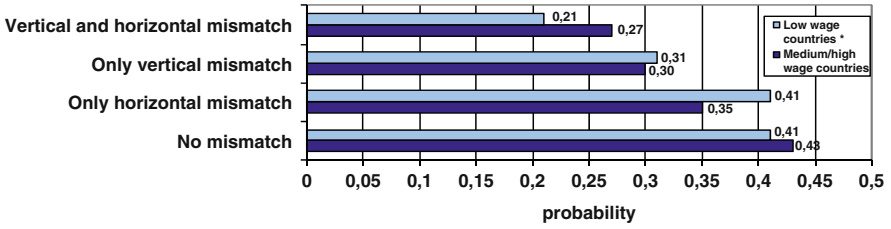

Fig. 8.30 Estimated probability of being satisfied with the job. Effects of job mismatch

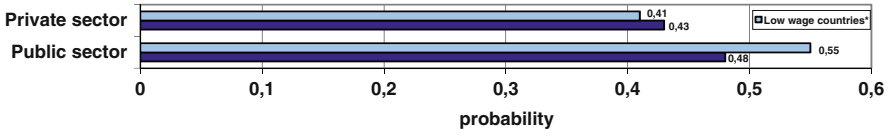

Fig. 8.31 Estimated probability of being satisfied with the job. Effects of public versus private sector

countries than in high-income countries. It may also be due to the fact that working in the private sector results in a wage gain in the high-income countries while the opposite is true in the low-income countries (additional analyses indicate that this is the case, available on request from the authors).

After controlling for the variables described above, some of the country differences in job satisfaction shown in Fig. 8.27 are reduced or changed. For instance, Spanish graduates turn out to be very often satisfied with their job when other factors are held constant. Despite the controls, Austrians are still most often satisfied with their job. It also appears that the effect of gender is minor, and that there are no differences between first and second levels of education, with one exception, although those with PhDs or specialists degrees are more often satisfied with their jobs than first- and second-level graduates. The differences between fields of study are also small, with one exception: *Graduates in the field of Education are more often satisfied with their work than the other groups*. This applies to both types of countries but especially in the high- or medium-income countries.

Overall, both the subjective measures of being a winner or loser on the three dimensions of work orientations and the objective measures of labour market situation and returns to education and (overeducation/mismatch; wages) are highly relevant for job satisfaction in both types of countries. However, wages are less important and intrinsic values more important in the high- or medium-income countries compared to the low-income countries.

8.6 Summary and Conclusions

In this chapter, we looked at a range of indicators of labour market success in an attempt to determine to what extent particular groups of graduates can be identified as "winners" or "losers" in the labour market. We looked at both objective indicators – unemployment, overeducation and wages – as well as more subjective indicators – aspects of work graduates themselves find important.

What is notable when looking at the results of this chapter as a whole is that, although groups that emerge as winners or losers on a given dimension often show similar results on some of the other dimensions, the overlap is far from perfect. Few groups are winners or losers across all dimensions, and some groups are winners on some dimensions and losers on others. The situation for female graduates is a clear illustration of this, with women being clear losers in terms of labour market outcomes as well as extrinsic (career) work values, but winners in terms of social-family work values.

Similarly, there are no fields of study that are clear winners or losers on all dimensions. However, graduates in the fields of Humanities and Agriculture and Veterinary studies are losers on several dimensions and do not emerge as winners on any of the dimensions. Graduates in the field of Education are winners when it comes to job satisfaction, relevant work and social values, but losers on wages and career orientations. There is a general tendency for winners on career orientations

and/or wages (Business, Computing and Engineering) *not* to be winners on other, more subjective dimensions.

Perhaps the most consistent factors influencing graduates' chances of being a winner on most dimensions are graduating from a vocationally oriented and/or prestigious study programme. Graduates of vocationally oriented programmes are winners on all dimensions, especially in terms of the chance of having relevant work (i.e., not being vertically or horizontally mismatched or unemployed) and the chance of being a winner on professional-innovative work values. Graduates of prestigious programmes were clear winners on all dimensions except social-family work values, on which they are neither winners nor losers. Graduates who achieve high grades are also more likely to be winners on most dimensions. Relevant work experience during higher education helps graduates in terms of objective labour market outcomes at the time of the survey, as do work experience and avoidance of unemployment since graduation.

Cultural and social capital show mixed effects on the chances of being a winner or a loser on different dimensions. Graduates with one or both parents having a higher education degree are more likely to be wage winners. Graduates with a good social network are likely to be winners on professional-innovative work values.

There are some strong relations between the indicators themselves. Labour market mismatch, especially when graduates are both horizontally and vertically mismatched, is a strong predictor of low wages and of the chance of being a loser in terms of all three types of subjective work values. Mismatched graduates are also clearly less satisfied with their work than graduates with relevant work. High wages are associated with being a winner in terms of career and professional-innovative work values and in terms of overall work satisfaction.

Finally, there are some clear differences between countries in terms of the chances of being a winner or a loser on the various dimensions. It should be stressed that country differences are to a large extent attributable to macroeconomic conditions and to resulting differences in the conditions encountered by graduates in the period of transition from higher education to work. With this in mind, we can summarise the country differences as follows: Italian graduates are least often among the winners on all indicators, both objective and subjective. The same applies to Spanish graduates in terms of objective measures, but they are among the winners on some of the subjective indicators. Norwegian graduates are successful on most of the indicators, especially the objective measures, but in general also on the subjective measures. Swiss and Austrian graduates score high on several indicators, the Swiss especially on wages and labour market match, and the Austrians on job satisfaction and the realisation of professional/innovative work values. In looking at the country differences in determinants of job satisfaction, we found evidence for the notion of a hierarchy of needs, with the satisfaction of graduates in high- or medium-income countries depending less on wages and more on intrinsic work values than is the case for graduates in low-income countries. However, overall, both the subjective measures of being a winner/loser on the three dimensions of work orientations and the objective measures of labour market situation and returns to

education (overeducation/mismatch; wages) are highly relevant for job satisfaction in both low-income countries and in high- or medium-income countries.

Appendix 1: Definition of Mismatch

1. *Employed with relevant work,* that is, persons not belonging to one of the four groups below.
2. *Horizontally mismatched* (and not vertically mismatched).This refers to persons who gave an answer to the question "*What field of study do you feel is most appropriate for this work*?" that indicated that their work did not correspond to their own or a related field.
3. *Vertically mismatched* (and not horizontally mismatched). This group is *overeducated* (overqualified) and the definition refers to those who gave an answer to the question "*What type of education do you feel is most appropriate for this work?*" ("type" refers to "*level*" according to the response options in the questionnaire) that indicated a level below their educational level. We have taken into account the fact that some have acquired a higher educational level after their graduation in 1999/2000 (as masters or second-level graduates or PhDs/specialists). First-level graduate/bachelors who had taken further education and have become masters or second-degree graduates and hold a job that corresponds to the first level/bachelor level are regarded as vertically mismatched and vice versa for master or second-degree graduates who have obtained a PhD/specialist degree.
4. *Both vertically and horizontally mismatched.*
5. *Unemployed*. This refers to respondents who answered that they were not currently employed and who reported that they had actively tried to obtain paid work in the past four weeks, or who reported that they were awaiting the results of earlier job applications.

Appendix 2: The Effect on Wages of Gender, Grades, Level of Education, Field of Study, Mismatch and Type of Job Contract, Percentage

	All countries	Italy	Spain	France	Austria	Germany	Netherlands	UK	Finland	Norway	Czech rep.	Switzerland	Belgium	Estonia
Gender														
Females/males	**–9.6**	**–11.9**	**–7.3**	**–12.4**	**–10.5**	**–10.7**	**–4.2**	**–10.4**	**–10.3**	**–9.9**	**–10.4**	**–4.8**	**–7.5**	**–15.0**
Grades														
Grades above average/average and below	**3.1**	**3.7**	**8.7**	3.4	3.6	**3.8**	1.7	**7.8**	–0.3	**4.4**	1.5	**2.2**	–1.1	**7.5**
Level of education														
First level/second level	**–10.3**	–3.6	**–14.1**	**–15.5**	6.2	**–8.1**	**–16.8**	–2.9	**–19.8**	**–16.4**	**–8.1**	**–5.3**	**–6.1**	–2.5
Field of study														
Education/social science	**–4.3**	–10.2	**8.4**	–4.4	–5.5	–5.2	**–6.5**	0.8	1.4	**–9.1**	**–14.7**	3.4	**–11.9**	–8.0
Human/social science	**–6.2**	–3.5	–1.1	3.8	**–10.4**	**–9.6**	**–9.2**	**–6.7**	–1.4	**–15.1**	**–20.9**	**–2.9**	**–10.4**	**–8.7**
Law/social science	–0.1	**–12.1**	–1.2	6.8	–4.7	**–13.7**	**8.7**	2.4	**24.8**	**–7.3**	–0.3	**4.0**	0.9	**21.8**
Business/social science	**11.8**	**7.0**	2.7	**21.0**	**16.7**	**26.4**	**7.1**	**15.2**	**9.3**	**18.5**	**5.8**	**8.6**	3.9	**26.4**
Computing/social science	**13.7**	11.2	**11.6**	4.2	**21.1**	10.2	**8.7**	–5.8	**20.5**	4.0	**8.4**	0.0	2.8	**27.4**
Science rest/social science	1.0	6.5	–1.6	**13.1**	4.0	5.0	**–5.4**	**8.2**	–1.8	**–7.2**	**–12.0**	**–4.1**	0.4	–8.9
Engineering/social science	**7.8**	**9.6**	**15.6**	**22.3**	**8.7**	**11.7**	1.5	**10.0**	**16.1**	0.6	**–5.8**	**–2.9**	1.5	**19.1**
Agriculture/social science	**–10.6**	**–28.3**	0.2	–5.0	–1.2	–4.6	–2.6	**–18.6**	–5.6	**–16.6**	**–21.4**	**–9.3**	–7.5	**–25.2**
Health/social science	–0.3	**8.2**	**7.3**	7.4	7.9	4.7	–0.9	**12.5**	2.0	**–4.2**	**–12.7**	**–4.8**	–1.1	–9.7
Service/social science	0.7	15.5	**16.2**	**13.9**	–8.3	5.2	1.3	–0.9	4.8	**–7.5**	**–7.2**	–18.5	**–18.0**	–9.0
Graduated from a prestigious education	**5.4**	**5.4**	**4.1**	**7.5**	–0.6	3.3	0.0	**8.7**	**2.7**	**5.4**	**2.1**	**2.6**	**5.5**	**11.9**
Further education														
Master as further education	**12.1**	0.5	**11.7**	**16.2**	–0.2	**19.1**	**15.6**	3.7	**27.7**	**13.1**	**6.0**	**9.0**	**9.1**	5.8
PhD as further education	**8.7**	**11.3**	0.2	9.1	**11.9**	7.3	4.9	4.5	**11.1**	6.1	**9.2**	1.6	**11.5**	6.1
Other further education	**1.7**	–0.4	2.3	1.7	1.8	**5.7**	1.2	**5.7**	0.5	–0.3	–0.5	**2.7**	0.7	5.1
Mismatch														
Horizontal mismatch/relevant job	**1.6**	–0.4	**–7.6**	–2.7	3.6	1.4	2.2	–0.5	**5.4**	**11.9**	**5.0**	**3.8**	–1.1	7.5
Vertical mismatch /relevant job	**–11.6**	–3.9	**–14.7**	**–12.6**	**–11.8**	**–6.8**	**–13.3**	**–15.8**	**–17.0**	**–6.2**	**–13.2**	**–4.0**	**–11.3**	–3.6
Horizontal and vertical mismatch /relevant job	**–11.4**	–6.3	**–9.3**	**–12.1**	**–10.4**	**–17.1**	**–10.3**	–9.7	**–8.1**	**–18.5**	0.7	**–10.4**	–0.5	7.0
Type of contract														
Permanent job /temporary job	**13.0**	**13.4**	**10.3**	**22.9**	**10.1**	**18.7**	**10.5**	**10.7**	**15.5**	**11.7**	**14.5**	**20.2**	**16.1**	–1.6
Country (compared to the Netherlands)		**–38.1**	**–30.8**	**–9.1**	**–8.9**	**14.4**	Ref. cat.	**4.3**	**–8.7**	**8.3**	**–48.7**	**21.9**	**2.7**	**–38.6**

Coefficients in bold are significant at 0.1 level or below.

Appendix 3: Definition of Winners and Losers According to the Graduates' Response to the Questions on Work Values and Job Characteristics (Realisation of Work Values)

1. For all the ten work values items, a variable was created according to whether or not the item was important for the respondent. Value 4 (important) + 5 (very important) on a scale from 1 to 5 were recoded as important (assigned value 1, else 0).
2. Losers and winners variables were created for each of the ten items of job characteristics (to what extent the work values apply to current work). If the respondent had value 1 on the variable mentioned above, that is, finds the item important, and value 1 or 2 on corresponding item for job characteristics, he/she was coded as a loser on this variable. If the respondent finds the item important and value 4 or 5 on corresponding item for job characteristics, he/she was coded as a winner on this variable.

   From the results of the factor analyses of work values, we knew that the work values clustered into three dimensions, allowing us to identify three groups that are career oriented, professional oriented and "social values" oriented. The next step was then:
3. Three new variables were created "lose/win-career", "lose/win-innovative" and "lose/win-social", all with three values; value 1=lose, value 2=win, value 9=neutral, the latter as the reference category to be used in multinomial regression. These variables were created according to the following:

   - Based on step 1 and 2, a respondent was categorised as a winner on the "*lose/win-career*" variable if she/he had value 1 on (at least) two of the three job-characteristic variables "win-earnings", "win-career-prospects" or "win-social-status", and she/he was categorised as "loser" on the "*lose/win-career*" variable if he/she had value 1 on (at least) two of the variables "lose-earnings", "lose-career-prospects" or "lose-social-status". Else, the respondent was categorised as neutral.
   - Likewise values were assigned on the "*lose/win-innovative"* variable according to the response to the three job-characteristic variables that concern autonomy, new challenges or learn new things.
   - Finally, values were assigned in the same way on the "*lose/win-social"* variable according to the respondent's answers to the four job-characteristic variables that concern job security, leisure activities, do something useful for society and combine work and family. (The coding of "*lose/win-social"* variable was based on the respondent being a winner/loser, respectively, on three of the *four* items covered by this dimension.)

   Multinomial logistic regressions for each of the three winner situations (dimensions) were run. For each of the regressions, respondents who found one of the three (four) items connected to the particular dimension important were selected.

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Chapter 9
Conclusions and Policy Implications

Rolf van der Velden and Jim Allen

9.1 General Conclusions

9.1.1 Most Graduates Undergo a Successful Transition to the World of Work. . . .

In general, one may say that higher education graduates in most of the European countries fare well in the labour market (see Chapter 8). Despite the deep-rooted differences between the national higher education systems, similarities in outcomes are more striking than differences. A high proportion of the human capital that is produced in higher education appears to be put to good use in the world of work. The unemployment rate is generally low, and almost three-quarters of all graduates indicate that their knowledge and skills are sufficiently used. That said, there is still some room for improvement, particularly for the more than one out of four working graduates who indicate that their competences are insufficiently used. Apparently, employers do not make full use of the human capital that is at their disposal. Moreover, there are countries and fields of study where graduates find it especially difficult to find a good position. Of course, part of the variation across countries and fields of study is due to different national economic conditions or differences in the demand for graduates in specific fields of study, but this is not always the case. Apart from the "usual suspects" (Humanities, Southern-European countries), the United Kingdom stands out as a country where graduates – even five years after graduation – find it difficult to get a job in which their skills are fully utilized. This might be related to the fact that the UK higher education system is much less linked to the world of work than many continental higher education systems.

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9.1.2 . . . . But There Are Differences between Objective and Subjective Measures of Success

Most studies of the transition from higher education to work look at objective outcomes, such as employment chances, wages and type of work contract. However, graduates may have very different goals to strive for: high earnings may be important for some, but others may place more value on jobs that are challenging and give the opportunity to develop one's skills. In this report we looked at subjective indicators – the extent to which graduates realized the things that they themselves find important in work – in addition to objective indicators of success. It is interesting to note that the same factors that determine objective success often also affect subjective success (see Chapter 8). Winners on different dimensions often have above-average grades, have access to a good social network, have acquired relevant experience during higher education and have graduated from demanding, vocationally oriented and academically prestigious programmes. Males are generally more likely to be career winners than females, but females are more often winners in terms of social-family work values. Graduates from fields like Humanities and Agriculture did less well in most respects than graduates from other fields. Graduates who experienced difficulties in the early transition were often still lagging behind on the different success dimensions five years later. The main exception to the general pattern was the social values dimension of success, which appeared to depend on quite different things than success on the career and professional dimensions.

9.1.3 Three Trends and Five Demands

How is this professional success of graduates related to the competences they need to possess? We started our analysis with the identification of three trends in the world of work relevant for higher education graduates: the growing importance of human capital, the growing importance of flexibility and the importance of globalization. These three trends result in five demands put on higher education graduates. In our view higher education graduates are expected to be more or less competent in at least the following five areas: professional expertise, functional flexibility, innovation and knowledge management, mobilization of human resources and international orientation.

9.1.4 The Dominant Role of Professional Expertise

An important conclusion of this report is the dominant role of professional expertise as determinant of labour market success. In many debates the role of professional knowledge and skills is undervalued, often with reference to rapid technological developments which are expected to render occupation-specific skills obsolete. This has sometimes resulted in strong pleas to focus on generic skills, such as problem

solving or learning-to-learn. However, it is doubtful whether such generic skills can be developed without the context of a specific field. Problem-solving abilities or learning abilities cannot be developed without some relation to content and it is this content that constitutes the heart of a specific discipline or field of study. Training in a specific field of knowledge serves in this view as the carrier through which generic skills may be developed. In line with this, we note that professional expertise is very important for labour market outcomes. It is positively related to finding work quickly and to higher wages (see Chapter 2). Although the data do not allow us to draw inferences about a direct causal link (the effects may actually be related to characteristics of the job rather than the worker), we do find the results consistent and convincing. Professional expertise seems important not only for the "old professions" but for the new ones as well (see Chapter 3). Moreover, it promotes success not only for those working inside their own domain, but also when one is working outside one's own field of study (see Chapter 6). This suggests that a good education in a particular field not only provides graduates with the skills that are needed in jobs that match that field, but also provides a basis for the development of more general analytical skills that can be applied in other areas as well.

It is important to note that the role of the professional has changed, and that many characteristics of the "old professions", like medicine and law, are not applicable to many of the "new professions" in areas like engineering and business (see Chapter 3). Although most graduate jobs require that one has been educated in a certain area of study, strict exclusivity in this respect is only the norm in the case of the "old (classical) professions". Moreover, most professionals nowadays are no longer fully autonomous in their work, but typically work in organizations in which they are mutually dependent on others. Even the "old professionals" rarely have complete control over their own activities in the sense of being self-employed and/or free of supervision. This highlights the importance of the second-most important core competence that graduates need to possess: the ability to mobilize one's own and other's human resources.

9.1.5 Mobilization of Human Resources Is Also Important

The mobilization of human resources is important in all kinds of professions (see Chapter 3) and is, after professional expertise, the second-most important core competence in terms of predicting success in the labour market. It increases the chance of finding employment – essential if one is to mobilize any human resources at all – and has a positive impact on wages (see Chapter 2). When discussing the mobilization of human resources, it is important to make a distinction between mobilizing one's own resources and mobilizing the resources of others (see Chapter 6). Most higher education graduates have been rather successful in mobilizing their own human resources: most are employed in a more or less full-time capacity and are able to utilize most of their skills, even when working in a job that does not require a higher education degree. Not surprisingly, less graduates play a direct role in mobilizing the human resources of others. Nonetheless, a considerable proportion of graduates

do play such a role, for example, by supervising and/or assessing others or bearing strategic and/or decision-making authority for their organization.

9.1.6 Mixed Role of Functional Flexibility

The role of flexibility as a core competence seems to be less clear. Although higher education graduates are exposed to some forms of external flexibility like job mobility, unemployment spells, and temporary employment contracts (see Chapter 4), this seems to be mainly a temporary phenomenon in the initial transition from higher education to work. Although unemployment spells clearly have a negative effect on the later career, other forms of external flexibility may often be more an opportunity than a threat. Most graduates have reached a stable and satisfactory position within five to six years after leaving education (see Chapter 8), and the small group that is still in temporary employment not only consists of "losers" in the labour market, but also contains the privileged and well-trained group of graduates working in Ph.D. or equivalent specialist trainee programmes. In this sense, we find little evidence that the labour market for higher education graduates is very insecure or precarious.

However, this only refers to external flexibility. The opposite is true for internal or functional flexibility. Functional flexibility – the ability to cope with changes in the work environment – does play an important role in the professional life of graduates. Many graduates have already been faced with important changes in their work tasks or with changes in their work environment (see Chapter 4). Competences related to functional flexibility do not appear to be directly rewarded in the labour market, but they do play a role in protecting graduates when coping with changes at work. Being very flexible in the sense of being prepared to take on work outside one's own specific area of training can, in fact, hamper the possibility to fully utilize all of one's skills as – by definition – only a part of these skills will be put to use in any job.

9.1.7 Innovation and Knowledge Management Not Always Rewarded

The fourth core competence that we distinguished – that of innovation and knowledge management – also plays a somewhat fuzzy role. Although innovation and knowledge management are generally considered key factors driving economic growth, possessing innovative skills does not always lead to labour market success. In fact, such skills are negatively related to employment chances and earnings (see Chapter 2). In contrast, being engaged in innovative activities (as opposed to possessing a high level of innovative skills) is clearly rewarded (see Chapter 5). Apparently, innovative competences are only rewarded when they are directly linked with actual innovative activities. Although innovation as such takes place more often in large organizations, higher education graduates working in small organizations

are more likely to actually play a role in introducing such innovations. A certain amount of autonomy is needed to create an environment in which innovation can take place. Being engaged in innovative activities is not only related to the typical innovative competences, but also with other competences like communication skills.

The analysis in Chapter 5 makes clear that innovation is not solely related to the typical hard-core R&D jobs in the private sector, but is important in other jobs and other sectors as well. For example, teachers play an important role in the innovation of knowledge and methods, even though most would probably not think of them as core innovators. Innovation can thus be seen as important and widespread.

9.1.8 International Orientation Is Important, But Language Skills Are Often Lacking

International experiences are widespread (Chapter 7). More than a quarter of the graduates reported that they spent some time abroad for study or work, and even more indicate that they work in an organization with an international scope of operations and/or require a high level of foreign-language proficiency. Given this high exposure to international influences, it is worrying that foreign-language proficiency is most often cited as one of the weak points of the study programme. Spending time abroad for study or work during or after higher education has a positive effect on the transition to the labour market. It not only has a positive impact on the chance of being internationally mobile after graduation and the chance of obtaining work that requires international competences (see Chapter 7), but is also related to higher wages in general (Chapter 2).

9.1.9 Demands More or Less Universal

In our survey, we found evidence that the demands in the areas of professional expertise, functional flexibility, innovation and knowledge management, and mobilization of human resources are more or less universal (Chapter 2). The required level is relatively high, with little difference, in general, between the different competences, although there are some differences between the countries. Although the supply of competences in these areas is also rather high, at an individual level supply does not always match demand. Some 10% of the graduates indicate that their own competence level is lower than what is required of them in the job and around 15% that their competence level exceeds the requirements. Although these percentages may seem low, we should note that they may have serious consequences. Shortages can make it more difficult for graduates to adequately perform their job, while surpluses may be indicative of work situations that fail to get the most out of graduates. There is less demand for foreign-language skills, and many graduates report a surplus of such skills. At the same time, in several countries a rather large proportion of graduates report a shortage of foreign-language skills.

9.1.10 Higher Education Could Do Better According to Many Graduates

When looking at the extent to which higher education prepares graduates well for the world of work, it is important to distinguish between the shorter and longer term. In the shorter term, we expect higher education to provide graduates with a good basis for starting work. In the longer term, higher education should provide a basis to acquire additional knowledge and skills on the job, and for career development in general. With respect to both the short- and long-term goals, only 50–60% of the graduates indicated that their study programme clearly succeeded in providing a good basis, while 15–20% indicated that their study programme clearly failed to do so. This is particularly worrying as providing a good basis to start working and to develop your career may be considered as key goals of higher education.

Interestingly, graduates were most satisfied over higher education in terms of providing a good basis for personal development (70% on average). In contrast, only 20% indicated that their higher education programme provided a good basis for developing entrepreneurial skills. Clearly, developing entrepreneurial skills is one of the weak points of the higher education system all over Europe.

9.1.11 Higher Education Often Not Very Demanding

Given that many graduates are less than satisfied about the preparation they have received in higher education, the important question is what it might do to improve this. Higher education, in general, is not considered to be very demanding. Only slightly more than half of graduates indicate that their higher education programme was very demanding. This failure to provide students with a challenge is probably one of the reasons why so few graduates (36%) indicated that they did more work than was strictly required to pass the exams. Especially the Netherlands stands out as a country where students have an "easy life": less than a third of Dutch graduates indicated that their study programme was demanding.

9.1.12 What Can Higher Education Do?

What can higher education do to give their students a better start in the world of work? What are the characteristics of the programmes that are successful in this respect? In analyzing this, we can distinguish between two different functions of education: the skills production function (the role of education in providing their students with relevant competences) and the allocation function (the role of education in ensuring that graduates find appropriate work). Although both goals are clearly connected, they are by no means the same, nor are the characteristics that make programmes efficient in achieving either one of these two goals. Graduates may have a high level of competence and still find it difficult to find a job in which they can

fully utilize these competences. Moreover, some higher education characteristics may help graduates to find relevant work, although they do not in themselves have an effect on the acquisition of skills.

9.1.13 Programme Characteristics

It is clear that following a demanding programme is good for developing competences, but it does not necessarily lead to a strong position in the labour market. By contrast, following a programme with which employers are familiar mainly has a strong effect on labour market success, but only a weak effect on the development of professional expertise and mobilization of human resources, and no effect on the development of competences in the other areas. This means that these programmes do not necessarily produce or select more competent graduates, but they are by far the best in ensuring that they find a good job. The effect of following academically prestigious programmes is related to both functions: they select or produce more competent graduates, but they also serve as a signal to future employers, thus helping to have a smooth transition and enter elite positions. Vocationally oriented programmes are good for developing professional expertise and are very strong in providing a good basis to enter the labour market and develop the career.

9.1.14 Modes of Teaching

Modes of teaching and learning also play a role. The level of competence in all core areas, except foreign language-skills, is strongly related with stressing theories and paradigms. Written assignments are also related to higher levels of competence in all five areas, while oral presentations promote competences in all areas except professional expertise. Group work and participation in research are related to somewhat higher levels of competence in the areas of functional flexibility, innovation and knowledge management, mobilization of human resources, and, only in the case of group work, to professional expertise, while project- and problem-based learning is related to a higher level of innovation and knowledge management. Most of these characteristics also affect the evaluation of the programme. Stressing facts and practical knowledge; stressing theories and internships; giving lectures all help to prepare students for the working life, mainly because they provide an important means to acquire professional expertise.

9.1.15 Other Experiences

Apart from experiences in higher education, other learning experiences are just as relevant. Time spent on relevant work experience has a positive effect on competence development and all labour market outcomes. Having a position in a student

or voluntary organization enhances competences, but has no additional effect on labour market outcomes. Time spent on non-relevant work experience has a small effect on development of competences in the areas of functional flexibility, innovation and knowledge management, and mobilization of human resources and increase the chance to find a job. Experience abroad mainly enhances foreign-language skills and has a small positive effect on wage levels.

Having a high relative grade is related to higher levels of competence and has a pronounced effect on helping people to get into better-paid jobs. Surprisingly, indicators of study behaviour (like working hard and study hours) hardly affect competences and even show an adverse effect on some labour market outcomes once we control for grades. This is in line with the effects we noted earlier on following a demanding programme. Although working hard is probably one of the best ways to develop your competences, we see no direct reward in the labour market. Working hard is not rewarded in itself, but signalling this in the form of higher grades is.

9.2 Policy Implications

When it comes to policy implications, we would like to distinguish the following main stakeholders: the European commission, national governments, employers, higher education institutions and students.

9.2.1 European Commission

International Graduate Surveys Offer Important Insights into the Changing European Higher Education Systems: They Should Be Repeated at 5-Year Intervals

The analyses in this report make clear that a wealth of information can be extracted from surveys like REFLEX and its predecessor, CHEERS. In many respects, country differences are not always as large as is often assumed, especially given the fact that the population comprises graduates of the pre-Bologna regime. Nonetheless, there are some deep-rooted differences, both between systems of higher education and between types of study programme within systems that are clearly related to the effectiveness of higher education programmes in preparing graduates for the labour market. The results in this report highlight these differences, and provide an indication of their relation with quality. Building on insights obtained in the first international survey CHEERS carried out in 1999, the REFLEX project has developed the methodology and instruments needed for repeating these surveys on a more regular basis. This enables the monitoring and evaluation of the outcomes of the Bologna process and other reforms with respect to the labour market. We recommend that the European Commission takes the lead in fostering such follow-ups.

Although Higher Education Is Increasingly Internationally Oriented, This Does Not Keep Pace with the Even More Rapid Trend Toward Globalization

Many graduates work in an environment that is strongly internationally oriented. Despite the fact that many students have followed part of their study programme abroad, higher education graduates all over Europe indicate that foreign-language proficiency is one of the weak points of their study programme. The European commission should do more to foster international exchange in higher education, as well as activities designed to strengthen foreign-language proficiency, for example, by co-financing study programmes offered in a foreign language.

9.2.2 National Governments

Strengthen the Core Orientations in Higher Education

The results seem to suggest that both vocationally and academically oriented higher education have their own distinct value in preparing graduates for the labour market. In fact, the more higher education study programmes emphasize the development of professional expertise in either of these orientations, the more successful they are. National policies should aim to strengthen both academic and vocational higher education.

Different National Solutions Are Needed to Solve Problems

It is interesting to see that despite the many differences that existed in the European higher education systems (recall that the graduates in the REFLEX survey were not affected by the Bologna reforms), the overall impression is that the country differences in terms of outcomes are not overwhelmingly great. This suggests that different national equilibriums may exist and that solutions that work in one country cannot simply be exported to another. This does not mean that there are no countries in the danger zone. Italy, France and Estonia represent countries where a relatively large share of the graduates experience some serious shortages in their competences. Many French graduates also experience a surplus of competences, indicating that in that country many graduates are either over- or under-qualified.

Noteworthy is that apart from the Southern European countries, the United Kingdom stands out as a country where graduates find it difficult to find a job that fully utilizes their skills. Although five years after graduation the unemployment rate of the UK graduates is average, their share of holding a lower-level job and/or a job in which they cannot fully utilize their knowledge and skills is much higher than in most of the other countries. It is not clear whether this is caused by the weaker link between higher education programmes and specific areas of employment in the United Kingdom or with the fact that most UK higher education graduates have followed programmes that are much shorter in duration than most programmes in continental Europe. But the fact that UK graduates have not been able to catch up

in the first five years after graduation and more often indicate that their study programme did not provide a good basis to start working, to learn on the job or to perform current work tasks deserves serious attention.

Encourage Work Experience During Higher Education, Especially Experience That Is Related to the Study Programme

It is clear that study-related work experience during higher education enhances the development of all kinds of competences, and even after controlling for competences is related to a successful transition from higher education to work. Although a strong majority of graduates in most countries enter the labour market with some form of relevant work experience, there are still countries where this only applies to a minority of graduates. Many graduates spend time during higher education on work experience not related to the study programme. Whereas such experience also conveys some advantages in terms of competences and easing the transition from higher education to work, these are modest when compared to those of study-related work experience. National governments should encourage the combination of study with relevant work experience, and set a goal that all students leave higher education with some form of such experience. Students who now do part-time work in non-study-related areas to help pay their way through higher education should be encouraged to seek work more closely related to the field of study.

External Flexibility Is Not Always Bad

Being exposed to external flexibility in the form of multiple changes of employer is often regarded as undesirable. The analyses in this report make clear that where this is accompanied by spells of unemployment, this can have some damaging effects on the later career, but that external flexibility per se is not harmful, and can even be a source of further skill development. Having a temporary contract in the first job is not harmful, and mobility can often better be regarded as an opportunity than a threat. National policy should foremost be focused on promoting a smooth transition between jobs, and encouraging graduates to choose employment – even on a temporary basis – above unemployment.

9.2.3 Employers

Employers Should Be Aware of the Large Reserves of Underutilized Human Capital at Their Disposal

One out of four graduates indicates that their knowledge and skills are not optimally used in their work. This seems particularly true for competences in the area of innovation and knowledge management. Especially in the private sector and in firms operating in an unstable market, there are reserves of human capital that are not fully being utilized. Interestingly, organizations that are considered to be at the

forefront of innovation make better use of the potential of the graduates. We also found evidence that a certain amount of autonomy is needed to create an environment in which innovation activities can take place. Reaching the Lisbon goals may be more attainable if employers more fully exploit their highly educated employees' potential.

Employers Should Develop Better Policies to Accommodate the Feminization of the Graduate Labour Market

In the past 20 years, females have rapidly increased their shares in higher education, taking the lead in many fields of study that used to be dominated by males, such as medicine. However, after graduation, women are more often unemployed and earn considerably lower wages than men. This is not a result of self-selection, as even women who place a high value on having a successful career find it more difficult to be a winner in this respect than men. The disadvantages are exacerbated by having children, which has an additional negative effect on women's careers but a positive effect on that of men. Given the shortages of labour in most European countries due to the ageing population, employers simply cannot afford not to make full use of the growing supply of higher educated women. This means that good policies must be developed to attract and retain women, also in top positions.

Employers Should Look for Better Signals of Quality

Our results show that graduating from a programme with which employers are familiar is highly rewarding, even though these programmes do not necessarily produce better graduates. The same applies for some other traditional "signals", such as the prestige of the programme, grades or having followed an internship, which are not necessarily related to the competence level of the graduates. It seems that employers heavily rely on these signals to reduce uncertainty. However, this strategy does not necessarily result in hiring the best graduate and there may be a need for more diversity in the hiring process.

9.2.4 Higher Education Institutes

Study Programmes Should Be More Demanding

One of the prime goals of higher education should be to optimally develop the talents of students. As "time on task" is the best predictor of learning outcomes, this implies increasing the study load and creating a culture in which hard work and striving for excellence is valued and rewarded. The results show that only slightly more than half of the graduates indicated that their programme was (highly) demanding. This percentage differs strongly between the different countries. Especially the Netherlands stands out as a country where students often indicate that their study programme was not very demanding.

Study Programmes Should Focus on Strengthening Professional Expertise

In the past decade, we have seen a shift from stressing specific competences to focus more strongly on generic competences. However, developing professional expertise provides the main basis for entering the world of work and developing one's career, even when working in jobs outside the domain of the field of study. A basic rationale for higher education is to impart professional expertise, and given the relatively low percentage of graduates indicating that this is a strong point of their study programme, higher education institutes should strengthen this further.

Student-Centred Methods May Work, But Don't Ignore the Value of Knowledge

We saw that student-centred methods like project- and problem-based learning have a positive effect on providing graduates with a good basis to enter the labour market, their further career and – interestingly – they seem to be the modes of teaching most associated with developing entrepreneurial skills. However, there is no clear relation with developing high levels of competence in most areas (except the area of innovation and knowledge management). Our preliminary conclusion is that new methods may work, but old methods should not be forgotten. There is a tendency in education to think that knowledge in itself is not important anymore, as technological developments seem to render knowledge and skills obsolete soon after graduates have left higher education. However, theories, facts and practical knowledge are essential components to develop expertise in any area, and it is this professional expertise that is most clearly associated with labour market success.

Assessment Drives Learning as Well

The design of the curriculum and the modes of teaching are not the only ways to affect learning. As educational research makes clear, assessment drives learning as well. In this respect, using written assignments or oral presentations are a better way to develop competences and provide a good basis for entering the labour market and developing a professional career, than using multiple-choice exams which merely seems a good way to test the short-term memory capacities of students rather than a way to develop deep-rooted insight.

Give Credits for Relevant Work Experience

Work experience closely related to the field of study or holding positions in student or other organizations clearly has a positive effect on the development of relevant skills. Higher education institutes could foster this by giving credit points to students who perform such relevant work. This would encourage students to engage in relevant work instead of non-relevant work activities.

Don't Overestimate the Positive Effect of Internships and Work Placements

Graduates who followed a programme that stressed internship or work placement were more positive in their evaluation of the programme providing a good basis to start working. However, we found no effect on the development of competences, nor did we find any effect on current employment chances or earnings. This seems to indicate that its role is mainly in providing a smooth allocation to jobs, rather than in developing professional expertise.

9.2.5 Students

Follow Your Interest and Talent

Although graduates from some fields of study (such as Humanities and Agriculture and Veterinary) find it more difficult to enter the labour market and acquire a good job, this by no means indicates that these fields of study should be avoided. For all fields of study we find that two-thirds (or more) of the graduates are satisfied with their job, and this also applies to the two fields mentioned (Humanities and Agriculture and Veterinary studies). Moreover, we find only small differences between fields of study in the percentages of graduates who regret the choice of their programme. In our view, students should primarily follow their own interest and talent when choosing a study programme in higher education. Information about labour market prospects can of course play a secondary role in helping students choose between programmes they are equally interested in.

Acquire Relevant Experience Outside Higher Education

Our findings show that acquiring work experience that is related to the study programme is beneficial for later labour market outcomes. It is also beneficial to hold a position in student or other voluntary organizations (e.g. chair, committee member) or to spend time abroad for study and/or work. These experiences have a positive effect on the development of skills and serve as a signal to future employers. Although many students are engaged in non-relevant work to cover the costs of living, it is far better to focus on relevant work experience. Non-relevant work pays off less in the long run.

The Relevance of a Good Network

Having a good social network helps one find a job that matches one's education. This network does not only relate to family, friends and teachers but extends to other contacts as well – for example, contacts acquired through work experience. Especially these professional contacts may play a role in providing information about job opportunities and support in finding a job.

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