Chapter 1
Research in Higher Education Institutions Outside the University Sector

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Introduction

In many European countries, higher education institutions outside the university sector now have a formal mandate to perform research related to regional needs and the improvement of education and professional practice. In addition, in the wake of the Lisbon strategy aiming to make the European Union the most competitive and dynamic knowledge economy in the world, the role of these institutions has been put on the European political agenda. There is, however, a general lack of knowledge on the extent of research in this sector, on research conditions and research capability and on the results of this activity. Apart from a few national case studies, this issue has not received much attention in the scholarly literature so far. However, the European Network for Universities of Applied Sciences recently initiated a report on research in these institutions, aimed at identifying good practices of research activities relevant for professional education (de Weert & Soo, 2009).

The purpose of this chapter is to give a general account of the state of the art of research in higher education institutions outside the university sector through focusing on eight selected European countries: Belgium, the Czech Republic, Finland, Germany, Ireland, The Netherlands, Norway and Switzerland.

Most European countries now have a wide range of institutions that offer short-cycle professional and vocationally oriented programmes. However, from a historical perspective, the status of these establishments as higher education institutions is relatively new. Prior to 1960, most European higher education systems were university-dominated. Schools offering short-cycle professional programmes, such as teacher training, engineering, nursing and social work, were not considered as higher education establishments. However, in the ensuing years, most Western European countries gradually developed dual and later binary systems by

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upgrading professional schools, by establishing new types of colleges and by formalising a division between universities and other higher education institutions (OECD, 1991; Scott, 1995; Kyvik, 2004; Taylor, Ferreira, Machado, & Santiago, 2008; Kyvik, 2009a). In the dual systems, there were a large number of different professional colleges with distinct cultures and they were subject to different public regulations. This functional organisation principle, with many small and specialised institutions that offered 2- or 3-year vocational courses in a limited number of subjects, was common during the 1960s and 1970s. The binary system was first established in the UK in the mid-1960s by organising higher education outside universities into polytechnics based on mergers of specialised colleges according to geographic location. In the 1980s and 1990s, the majority of other Western European countries also established binary systems, while the UK in 1992 created a unified system by upgrading polytechnics and some colleges of higher education into universities (Pratt, 1997). So far, only Iceland has followed in the footsteps of the UK (Jónasson, 2004). In Western Europe, Spain already created a unified system in the 1970s by incorporating vocational post-secondary institutions into universities as separate schools (Bricall & Parellada, 2008). In Eastern and Central Europe, higher education systems have also been subject to substantial reforms. During the 1990s, many countries made efforts to create dual or binary systems, in some countries by upgrading professional schools to higher education institutions and in other countries by merging specialised higher education institutions into multi-faculty colleges (Scott, 2006). Thus, most European countries today have two distinct higher education sectors, although there are large variations between countries with respect to the relative size of the two sectors and the relationship between them.

In the English language, comprehensive higher education institutions outside the university sector are variably called ‘universities of applied sciences’, ‘university colleges’, ‘institutes of technology’ or ‘polytechnics’. In some countries, the professional higher education sector also encompasses specialised institutions, such as ‘colleges of education’. Several attempts have been undertaken to find a common English term for this sector which could be used in comparative contexts: ‘the non-university sector’, ‘the polytechnic sector’, ‘the college sector’ and ‘the alternative higher education sector’ are labels that have been applied, but a consensus never has emerged on how these institutions should be termed in international contexts (Teichler, 2008). For matters of convenience, we have chosen to use the term ‘university of applied sciences’ (abbreviated UAS), even though this term is contested. In four of the countries included in this study, Finland, Germany, The Netherlands and Switzerland, this term is now officially recognised as the name of the comprehensive institutions to be used in international contexts. In Belgium and Norway, university college is the official translation of the national name. In three of the countries, Czech Republic, Germany and Ireland, specialised colleges of education are also part of this sector, but only the comprehensive institutions are referred to in this study as UASs.

Even though in all countries many were critical to the development of research activity in the UAS sector, research has gradually come to play a larger role in

these institutions. The OECD report *Redefining Tertiary Education* (1998) thus stated that the policy intention to exclude research from designated non-research institutions seldom succeeds over time, but the reason for this is not that the staff see research as an important condition for good teaching. Rather, the issue is the status of research in tertiary education and the value that staff see in some kind of creative knowledge quest, whether in the form of basic or applied problem-solving research. The institutions themselves have usually wanted to develop a research mission, supported by the regional political community, but often resisted by the traditional universities and sceptical state authorities. However, the large and increasing size of this sector and the increasing number of research qualified institutional staff seem to have convinced many governments and regional stakeholders that these institutions should have an important role to play in the national R&D system, though there should be differentiation of emphasis from the role of universities.

In this chapter, after portraying the eight countries included in this study, we will present an analytical framework which puts us in a position to discuss and interpret the development of research in the UAS sector. Thereafter, we will give a brief overview of the sector's research mission and show how the notion of research is interpreted and used to characterise a wide variety of activities. Furthermore, we will give an overview of central issues related to the implementation of the research mission in this sector, both at the state and the institutional level.

The Countries Included in This Book

Eight European countries have been subject to analysis of research in the UAS sector: Belgium, the Czech Republic, Finland, Germany, Ireland, The Netherlands, Norway and Switzerland. Other European countries have also established a UAS sector where research has long been a mission in addition to teaching, for example, Sweden, Greece, Portugal and Austria. Thus, the selection of countries is not representative in the sense that they portray the general situation in Europe. Some countries have been selected because they have a UAS sector where research plays an important role (like Norway and Switzerland). Other countries are included because research in this sector is a relatively new activity (like in Belgium and the Czech Republic), while the remaining countries have been selected because they have a large UAS sector in which applied research and development have become tasks of growing importance. These differences between individual countries are in themselves of interest in the analysis of the development of research in these institutions.

All these countries have binary systems, but the UAS sector varies considerably between individual countries in terms of (a) types of institution included, (b) programmes provided, (c) degrees given, (d) the size of the sector, and (e) its status and relation to the university sector.

Types of Institution

The dominant type of non-university higher education institutions in each country is comprehensive multi-faculty establishments, termed *fachhochschulen* in Germany and the German speaking part of Switzerland, *hogeschoolen* in The Netherlands and the Flemish speaking part of Belgium, *hautes écoles* in the French speaking part of Belgium, *hautes écoles spécialisées* in the French speaking part of Switzerland, *institutes of technology* in Ireland, *ammatikorkeakoulu* in Finland, *vysoké školy neuniverzitního typu* in the Czech Republic and *statlige høgskoler* in Norway (Table 1.1). In addition, Germany and the Czech Republic have a wide range of specialised professional colleges, and Ireland has a number of colleges of education. Moreover, most countries have some specialised colleges in arts, design and music. In this chapter, only the comprehensive UAS-type institutions have been included as a basis for comparison.

Table 1.1 Terminology and number of UAS-type institutions by country in 2009

	National terms	English terms	Number
Belgium	*Hogescholen Hautes écoles*	University colleges	64
Czech Republic	*Vysoké školy neuniverzitního typu*	Non-university higher education institutions	43
Finland	*Ammattikorkakoulu*	Universities of applied sciences	30
Germany	*Fachhochschulen*	Universities of applied sciences	164
Ireland	*Institutes of technology*	Institutes of technology	14
The Netherlands	*Hogescholen*	Universities of applied sciences	45
Norway	*Statlige høgskoler*	University colleges	24
Switzerland	*Fachhochschulen Hautes écoles spécialisées*	Universities of applied sciences	9

The number of UAS-type institutions varies greatly between countries; from only 9 in Switzerland to 164 in Germany. These differences reflect not only population size and national topography, but also regional political considerations and the political will to merge small institutions into larger entities.

Types of Study Programme

Engineering and economics/business studies are the two major disciplinary areas in which commonly the UAS institutions in all involved countries provide study programmes. Other fields in which study programmes are typically offered by the UAS sector institutions are information technology, various types of health education, arts and design and social work. Teacher training for elementary schools is provided by UASs in Belgium, The Netherlands, Norway and Switzerland; by specialised colleges in Ireland and the Czech Republic; by the universities in Finland;

and in Germany, these teacher training programmes are offered both by the universities and by specialised professional colleges. In Norway, the university colleges also offer a range of disciplinary study courses usually confined to universities.

However, there are large differences between countries in terms of the relative size of these programmes. Engineering has a strong position in Germany, Ireland and Switzerland, while in Norway this programme area enrols only a minor part of the students.

Types of Degree

Although the Bologna Process has had a strong impact on the degree system in many European countries, there is a long way to go before a truly common system is realised (Kehm & Teichler, 2006). Nevertheless, the bachelor degree is introduced as the final qualification for students in most countries and in most professional UAS programmes, although with different length of study programmes. In Germany and The Netherlands, the UAS bachelor degree programmes take 4 years; in the Czech Republic, Belgium, Finland, Ireland, Norway and Switzerland the dominant length of study is 3 years.

In Norway, the university colleges recently have introduced a wide range of 2-year research-oriented master degree programmes in a selection of subjects. Such degrees also are offered by UASs, although on a smaller scale, in the Czech Republic, Germany, Belgium (1 or 2 years), Finland, Ireland, The Netherlands and Switzerland.

Ph.D. programmes have so far only been introduced in a few Norwegian university colleges and a few institutes of technology in Ireland. Also in the Czech Republic, a non-university higher education institution can obtain accreditation for a doctoral programme, but in that case it will also achieve university status.

Size of the UAS Sector

There is considerable variation in the size of the UAS sector in relation to the university sector in these countries, as measured by the proportion of students in higher education. However, a precise comparison of countries is difficult to make due to differences in classification and the inclusion of private colleges and a number of smaller educational institutions, in particular those covering arts and design. As an indicator, the percentage of first-year students in the two sectors has been used. This is a better indicator than the proportion of the total number of students because UAS education is generally of shorter duration than university education; a comparison with the entire student population would thus result in a lower ‘score’ than a comparison with all freshmen.

Table 1.2 displays the large differences between the various countries. The figures for the UAS sector also include students in specialised colleges. Figures have been rounded to the nearest 5%. The percentage of first-year students in the UAS

Table 1.2 Percentage of first-year students in 2007 in the UAS and university sectors in selected European countries

	UAS sector	University sector
The Netherlands	70	30
Belgium	65	35
Finland	60	40
Norway	50	50
Ireland	45	55
Switzerland	45	55
Germany	30	70
Czech Republic	25	75

sector is largest in The Netherlands and Belgium. Germany is the only country with a long-established binary system that has a relatively low proportion of first-year students in the UAS sector. The main trend in countries with a binary system has been that student numbers have increased stronger in the UAS sector than in the university sector. Moreover, the former sector has expanded more than anticipated (OECD, 1998).

The Development of Research in the UAS Sector – An Analytical Framework

In order to improve our understanding of the development of research in the UAS sector and the challenges that these institutions are facing in this respect, we have developed an analytical framework that places this sector in each country within a wider context constituted by four principal external actors – state authorities, supranational organisations, societal stakeholders and academia (see Fig. 1.1). The figure indicates that the UAS sector is structurally subordinated to the policies and

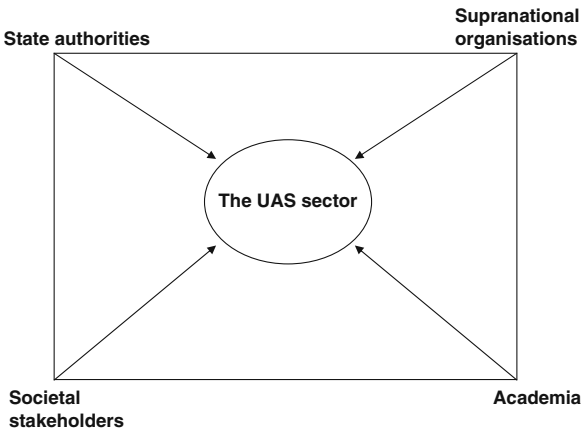

Fig. 1.1 The relationship between the UAS sector and state authorities, supranational organisations, societal stakeholders and academia

expectations of state authorities and supranational organisations, societal needs and demands, and the requirements of the universities and the academic community at large. The institutions in the UAS sector had to adapt to the expectations of these four groups of actors, but have also contributed in shaping their own trajectory of development. We will argue that the development of research in the UAS sector can be regarded as a special case of academic drift, though different from what is usually meant by this notion, and choose to use the term *research drift* to characterise this process.

But before proceeding with our new term, we will briefly discuss what the notion of academic drift implies. The term academic drift was originally coined to describe the tendency of non-university higher education institutions to orient their activities in ways that bring them closer to the university image (Burgess, 1972). The role of research in academic drift processes has, however, received relatively little attention in the literature on academic drift, which has largely concentrated on the introduction of more theory in the curriculum at the expense of practice, on the vertical extension of study programmes and on the introduction of university courses in non-university institutions. Horta, Huisman, and Heitor (2008) indicate that drift processes are also visible in the research context, but they argue that one has to be careful in determining this solely as a case of drift. With reference to Gibbons et al. (1994), they argue that the gradually disappearing traditional differences between basic and applied research and the fact that the higher education institutions outside the traditional university sector contribute to the dispersion of knowledge in their own particular way should be largely interpreted as semi-autonomous processes. We agree that the reasons for the development of research in these higher education institutions are more complex than a mere imitation of traditional university practice, or are mainly due to a desire of these institutions to bring them closer to the university image. There are other very good reasons why these institutions should develop research activities, for instance, to strengthen the scientific basis of professional practice in occupations in which universities do not train people for a career and to take part in regional innovation processes in collaboration with industry and local authorities. In this sense, we will argue that in many of these institutions, there is a drift towards developing research as an ordinary activity alongside teaching, but this drift is not necessarily motivated by a desire to become more similar to a traditional university.

We will further argue that research drift, in addition to taking place within the UAS sector itself, is impacted by the relationship between these institutions and each of the four external actors: state authorities, supranational organisations, societal stakeholders and the academic community at large. The state affects, directly and indirectly, the development of research in the UAS sector. Supranational organisations, such as the EU and the OECD, not to mention the Bologna and Lisbon processes, have profound influence on national discussions on the role of this sector in the research system. Societal stakeholders, such as local industry, have requested a stronger research commitment by the UASs in regional development, and universities and the academic community at large have great impact on the research practice in these institutions.

Research Drift as the Outcome of Internal Processes in the UAS Sector

The reasons why research drift takes place within individual UASs are complex. As an analytical approach to enhance our understanding of this process, we will look at the interplay between research-oriented staff members and entrepreneurial programme managers and institutional leaders, as well as at the role of students in these drift processes (see Kyvik, 2007).

Most staff members have traditionally performed their teacher role according to the expectations of their institution and profession, but many also have taken up research as a more or less regular work task. The majority of those who are recruited to these institutions have been trained in universities or specialised university institutions, many of them have some experience from research during their master level studies and increasing numbers of staff members hold a doctoral degree and expect to have the possibility to pursue their research interests. A theoretical explanation for such individual drift processes can be deduced from reference group theory (Merton, 1968). The basic idea is that people frequently compare themselves with individuals within groups other than their own when assessing their own situation. For UAS staff, their counterparts in universities are a most relevant reference group in assessments of working conditions, status and salary.

The UAS sector is constituted by programmes and courses which were developed to serve the needs of industry and the public sector and which initially were strictly profession-oriented with few links to the universities. A common trend for many programmes is a drift towards developing research activity. The reason for this drift is basically found in professionalisation strategies by entrepreneurial leaders and professional associations. Elzinga (1990) argues that professionalisation is characterised by the scientification of the knowledge core through the establishment of a research capability, as well as new career patterns based on research and research training, while the role of tacit knowledge in the training process is downplayed. Several arguments have been used to justify the necessity of doing research in professional and vocational programmes, and these will be discussed in Chapter 3.

At the institutional level, the basic mechanism behind research drift is much the same as for research drift at the programme level, but still different. While programme drift is driven by professionalisation processes, institutional drift is driven by status competition. Many institutional leaders regard the development of research as an important way of increasing the status of their institution. An adequate theoretical explanation for research drift at the institutional level can be drawn from organisation theory. There seems to be a universal tendency for organisational leaders to try to imitate other organisations they regard as more successful (DiMaggio & Powell, 1983), and polytechnics are no exception in their drive to enhance research activity.

Finally, students may have an indirect effect on research drift processes. According to the theory on *credentialism* developed by Collins (1979), students

compete for credentials in the form of college and university degrees in order to enhance their competitive advantage in the labour market and their social and cultural capital. This theory is of relevance to our subject, because if increasing numbers of UAS graduates want to extend their lower degree with a higher university degree and this alternative does not exist within the UASs, these institutions might try to develop higher degrees in order to sustain or advance their position in the higher education market. But to be able to establish higher degrees, UASs need to develop their research capability. Student drift towards universities might therefore indirectly enhance research drift in the UAS sector.

Thus, research drift in the UAS sector can be regarded as the combined effects of intertwined processes taking place at different levels within the UASs themselves. But in order to fully grasp the development of research activity in these institutions, we also have to include the role of state authorities, supranational organisations, societal actors and academia in these processes.

The Impact of External Actors on Research Drift in the UAS Sector

In regard to the research mission of the UAS sector, the state is not a single body, but is constituted by a ministry for research affairs, the government, parliament, as well as ministries for industrial and regional affairs. In addition, most countries have one or more national research councils or other agencies that implement state policy for funding of research in this sector. Over time, state policy for research in higher education outside the traditional university sector has in many countries changed from being very restrictive to encouraging. In this respect, the concept of 'policy drift' (Neave, 1979) can be used to describe the process whereby state authorities gradually change their views on the role of research in the UAS sector and the rights and obligations of its academic staff. This policy change may be due to pressure from the UAS sector and regional stakeholders, or to a shift in attitudes regarding the mission of these institutions.

International organisations also have had an impact on the research mission of the UAS sector, though more indirectly. The OECD regularly conducts reviews of the higher education systems in its membership countries, where recommendations for an enhanced research activity in higher education institutions outside the traditional university sector have been put forward. In its report on tertiary education, the OECD (1998) recommended that all higher education should take place in a research culture. Furthermore, the Bologna and Lisbon processes have each in its own way had an effect on the thinking about the status of higher education outside the traditional universities and the role of research in these institutions.

External stakeholders, such as regional political and administrative authorities and industry, may encourage, or even pressure, the local UASs to develop research activities as part of a policy effort to develop the region. The argument is that it

is important to carry out research on regional problems and issues and that this research should be undertaken by researchers living in the region. They have better knowledge about local conditions and may more easily identify with the problems of their region.

Finally, the development of research in the UAS sector has been influenced by the dynamics of research in the universities and the knowledge production in the academic community, as well as by the attitudes of universities to other higher education institutions. Academic knowledge production takes place predominantly within disciplinary communities and in the intersection between related disciplines (Clark, 1983; Becher & Trowler, 2001), and universities are the host institutions of disciplinary research, teaching and education and are, as such, centres of academic authority and power. In addition, many staff members in the UAS sector have been trained in universities and have brought with them norms and values on proper research conduct, and many also collaborate in research with colleagues in universities.

The Dynamics of Research Drift in the UAS Sector

According to the model presented above, the development of research in the UAS sector should be regarded as the outcome of mutually reinforcing processes taking place within the sector itself and between the UASs and state authorities, supranational organisations, societal stakeholders and academia. The state has affected the research conditions of institutions in the UAS sector, but the internal development in these institutions and their articulated demands have also affected state policy. Governmental reforms, like the introduction of reward structures emphasising research and publishing, may encourage research drift at the staff level, the programme level and the institutional level. Societal stakeholders, like local industry, have requested a stronger commitment by UASs in regional development, but UASs also have asked for a stronger engagement by local industry in joint research efforts. Universities set standards in research that UASs have to live up to, they train the doctoral students that have a career in the UAS sector and their staff collaborate with colleagues in the UAS sector, affecting research priorities and research practice.

The underlying theoretical assumption is that research-oriented staff, programme leaders and their professional associations, entrepreneurial institutional leaders, state authorities and external stakeholders take part in mutually reinforcing research drift processes. Research-oriented staff may, for instance, want to raise their status and pay through copying the research practice of their university colleagues. They put pressure on the institution to obtain better research conditions. In turn, institutional leaders and programme leaders, inspired by research achievements of parts of the staff, may put pressure on all staff members to do more research. Accordingly, the essence of this theoretical assumption is that research drift on one of the levels, which has been triggered by research drift on another level, may have a reverse effect on drift processes on the initial level, leading to mutually reinforcing and self-sustaining drift processes.

The Problematic Notion of Research

In all the countries, the government has stated that there should be a division of labour in research between universities and UASs. Basic research and research training are the responsibility of the universities, while the UASs should engage in applied research and development. In addition to the role of state authorities in this context, supranational organisations, regional stakeholders and universities have all played a role in the process of defining the research mission. There seems to be a relatively strong consensus among these stakeholders that there should be a division of labour in research between universities and UASs. The EU and the OECD have advocated a concentration of basic research in strong research environments. Universities want to keep research resources for basic research for themselves, while regional stakeholders are primarily interested in the contribution of UASs in the form of applied research, development and knowledge transfer to local industry and business enterprises.

However, there is no common perception of which scholarly activities constitute research in this sector, neither across countries nor within individual countries and individual institutions. Research is frequently used as a synonym for research and development (R&D) as defined by the OECD (2002) for statistical purposes. But the notion of research also often includes activities which are not part of the R&D concept as applied in national and international R&D statistics. Which activities should be encompassed by this concept is, however, not only a semantic discussion, but has consequences for the distribution of resources for research as well as for the evaluation of the outcome of this activity. Defining research and measuring its output has therefore become a controversial issue in higher education (Hazelkorn, 2005).

Research and development is a fairly imprecise term used for activities within relatively undefined boundaries. In order to be able to make international comparisons of contributions to R&D by various nations, the OECD has prepared guidelines for what should be included. The OECD's R&D concept comprises two main components: *research* and *experimental development*. The definition of research which was formulated by the OECD in the 1960s, and which has since formed the basis for its research statistics, has two sub-categories: *basic research* and *applied research*. The 'Frascati Manual' (OECD, 2002) emphasises that the boundary between basic research, applied research and experimental development is difficult to determine for all domains, partly because the concepts are difficult to operationalise and partly because the same research project frequently encompasses more than one type of activity. Still, these definitions are used by the OECD as a basis for the compilation of R&D statistics.

The terminology used in R&D statistics is, however, challenged by other concepts. For instance, in The Netherlands, various public documents refer to the distinction between Mode 1 and Mode 2 type of knowledge production (Gibbons et al., 1994), arguing that the UASs should concentrate on Mode 2 research (see Chapter 11). Terms widely used are 'design and development' and particularly 'practice-oriented research' or 'design research', rather than 'applied research'.

'Innovation' is another concept that is common terminology in this sector, but which clearly is not part of the statistical R&D term of the OECD. In Germany, 'technology transfer' and 'knowledge transfer' between UASs and industry are regarded as important objectives (see Chapter 9), and in the Finnish case the term 'training and development' is suggested as an alternative concept to R&D to pinpoint that most of this activity is undertaken in the context of student projects in cooperation with industry and other external actors (see Chapter 8). In the Czech Republic, virtually all polytechnic institutions extend the boundaries of research to include activities excluded from the definition of research used by state authorities and the universities (see Chapter 7). Thus, they include activities such as training and consultancy programmes, course development within the framework of the EU education programmes, as well as consultancy to private companies.

Similarly, in a study of new universities with a predominantly applied mission, not very different from many large UASs, Hazelkorn (2005, pp. 60–61) found that these institutions define research and scholarly activities in broad terms, including

- traditional academic investigation (whether basic, applied or strategic, and whether using quantitative, qualitative, practice-based or other methodologies);
- professional and creative practice (including architecture, visual, performing and media arts, and consultancy and related activities, etc.);
- knowledge and technology transfer (including development projects and other forms of innovation, commercialisation, software, prototypes, including evaluation and other externally commissioned contracts, etc.).

The point is that the terms 'research' and 'R&D' are used in various manners and often comprise activities other than those originally included in the concepts, even though it is clear that parts of this activity lie beyond the research concept as defined for statistical purposes and beyond those kinds of scholarly activities that are traditionally funded by research councils. This means that in practice the concept has two definitions: a narrow one for statistical purposes and a wider one for description of scholarly activities that go beyond the definition in the Frascati Manual. For matters of simplicity, in this book we will apply the concept of research as a denominator for all these activities.

National Strategic Measures

Even though higher education institutions have been granted greater autonomy by the central state authorities, the institutions can still be viewed as agencies in a state hierarchical structure. Accordingly, the development of a research strategy at the national level can be regarded as a new way of governmental steering of the institutions' scholarly activities. The most important strategic measures at a national level are (a) the formulation of the research mandate, (b) the funding of research

over the state budget, and (c) the design of career structures. In addition, national strategic measures include to a varying extent special programmes for academic staff to raise their research competence, demands for cooperation with universities in specific programmes and instructions to UASs to establish strategic plans for the further development of research.

The Research Mandate

Generally, governments have formulated two main objectives for research activities in the UAS sector: (a) research should be of relevance for regional development and (b) research should aim at improving education and professional practice. Obviously, the emphasis on each of these objectives varies between countries.

The relevance of UASs for the region and their role in regional innovation systems have long been emphasised by state authorities in all countries included in this book. The extent to which these institutions undertake research that supports these aims is examined in Chapter 2.

The relevance of research for the improvement of education and professional practice is discussed in Chapter 3. The authors distinguish between four arguments that have been used to introduce research in professional programmes: (a) Teaching will improve if the staff engage in research (research-based teaching), (b) students will learn more if they come into contact with research (research-based learning), (c) professional practice will improve if professional workers in their training learn how to base their work on research-based knowledge (research-based practice), and (d) professional programmes have an obligation to improve the knowledge basis of professional work through research (research-based knowledge production).

Funding of Research

In most countries higher education institutions outside the universities were created without a research mandate; and subsequently without funding for research. Gradually, however, some staff members started to undertake research, partly within the frames of their teaching positions and partly with funding from external sources. While research is stressed more than before, governments have not provided much money for research, and extra resources usually can only be provided through reducing the time for teaching or through the provision of third-party research grants. The national case studies reveal large variation in state policy, the extent of research funding and type of funding sources. In the development of research in the UAS sector, some topical questions are as follows: Should extra resources for research be transferred from teaching activities or through additional funding from the state? Should the UASs compete for grants and contracts with the universities, or would ring-fenced schemes be an option? To what extent should research funding of UAS

research be targeted towards specific purposes according to some public goals? Answers to these questions are likely to profoundly shape the configuration of research in UASs, and Chapter 4 provides a comparative perspective on different national choices in this respect.

Career Structures

In all countries included in this book, the state decides on the career structure in the UASs. In the universities, most academic staff members are entitled to and even required to spend time on research. These rights and demands are reflected in the names of positions and in the incentive structure; research output is the primary indicator of status and the main promotion criterion. In the UAS sector, with the exception of Norway, the career structure is quite different from that of the universities, reflecting the role of the UASs as primarily teaching institutions. Thus, the state is a key actor in defining the role of research in UASs through the design of career structures, through limiting the number of positions with a research mandate and through deciding on promotion criteria. Accordingly, an effective state measure to enhance research in UASs would be to introduce academic positions and career paths similar to those of universities. On the other hand, the main objective of the UASs is to train students for various professions. Thus it might be more important that staff have some practical experience from professional work than that they possess formal research qualifications. It has been argued that it is not reasonable to educate preschool teachers, nurses and physiotherapists with staff unfamiliar with the practice of their profession and unable to teach students technical, professional and social skills in working with children, patients and clients (Stjernø, 1999). As will be shown in the various country chapters, in this respect, national policies vary greatly. This issue is also addressed in Chapter 5.

Research Strategy at the Institutional Level

Over the last two decades, a common tendency in higher education systems in Europe is a development towards greater institutional autonomy (Maassen & Olsen, 2007). This development has been followed by the expectation of governments that individual institutions shall generate a larger share of their funding from external sources and undertake strategic planning through goal-setting and priority-making. But the institutions themselves have, for a variety of reasons, also become motivated to engage in such planning. In this respect, we may distinguish between strategic processes that aim at adapting to external expectations (state policy, international trends, regional demands and the knowledge production in academia) and processes that reflect the needs of leaders to change institutional behaviour (Presley & Leslie, 1999). However, the purpose of the strategic plan can be restricted to comply with external expectations through formal statements on the further development of research, rather than to provide a platform for institutional action (Larsen, 2000).

In general, the idea of an institutional strategy is part of what is usually called the managerial revolution in higher education, emphasising the need of a more coherent and purposeful institutional policy (Amaral, Meek, & Larsen, 2003; Hazelkorn, 2005). Over time, planning, reporting and allocation systems have become increasingly sophisticated, also in the field of research. Today, most UASs undertake some kind of strategic planning of their research activity, but relatively little is known about such processes in this sector, apart from a few studies of individual countries (Lepori & Attar, 2006; Kyvik, 2008), as well as a comparative study of research strategy in new universities aiming at developing their research capacity (Hazelkorn, 2005).

In broad terms, a research strategy at the institutional level could be defined as a plan defining the main institutional goals to be achieved in research by an institution as a whole, as well as the measures to reach them. In principle, a strategy should be stated in an official document approved by some institutional authority, but in a broader sense a strategy can also exist in a less formalised way, where some elements are more or less implicitly accepted in the institutions. A research strategy can be developed at different organisational levels: the state level, the institutional level, the faculty or school level and the department level. In recent years, we observe an increasing tendency to consider the level of the *individual institution* as a major strategic level, where key decisions concerning the portfolio of activities, the regulatory framework and the internal organisation are taken and then implemented (Amaral et al., 2003; Bonaccorsi & Daraio, 2006). In principle, the development of a research strategy is a hierarchical process where state guidelines direct institutional strategy, which set the boundaries for planning at the faculty level, which in turn constrain the strategy process in the basic units, ending up with guidelines for research activities which should be followed by individual staff members.

In reality, however, such strategy processes are much more complex; strategic development usually takes place simultaneously at these levels. In fact, instead of top-down planning, the development of a research strategy may take the form of a bottom-up process, where the strategy of a basic unit is a collation of individual plans, the strategy of a faculty is a summary of the plans of basic units and the institutional strategy is a list of faculty or school priorities.

We can distinguish between two major elements in a research strategy: (a) the definition of the research mission and positioning of the institution inside the wider national and international research system and (b) a plan or strategy for how the objectives should be achieved. With regard to the latter element in the research strategy, every analysis of strategies in new research institutions comes to a more or less similar list of issues which should be addressed (Hazelkorn, 2005):

- The organisation of research activities and the management of research.
- Policies concerning the allocation of funds and fund-seeking from external sources.
- Policies concerning the recruitment and development of human resources.
- Finally, cooperation with other research institutions and with stakeholders.

The national case studies indicate large differences between countries and institutions to the extent that research strategies are developed and implemented in the UAS sector.

Management and Organisation of Research

There seem to be large variations between individual UASs in all the countries involved, to the extent that they have established an administrative body to attend to research matters. These tasks typically include being a secretariat for research governing bodies, drafting strategy plans, suggesting rules and regulations for the allocation of internal resources among units and individuals, coordinating institutional policy, advising academic staff on proposal preparation, assisting with project administration and compiling statistics. The larger UASs may have set up a separate research office headed by a director of research, while in the smaller institutions these tasks are handled by the general administrative staff on a part-time basis.

There are also large variations between individual UASs in the extent that they have formalised research groups as part of the organisational structure, set up research centres and established research programmes in order to concentrate and profile research activities. Differences between UASs are typically related to their size and engagement in research, more so than to the national context.

Allocation of Funds and Work Time for Research

With the shift from a direct to a more indirect steering approach in the public sector, the UASs now have more room for making their own policy within the frameworks set by their government. However, institutions in the UAS sector generally have scarce resources for research, and an important part of a research strategy is to prioritise between research areas and define guidelines for the distribution of resources for research among academic staff (Kyvik, 2009b). The most important resource is staff time. Because resources for research are much more limited in these institutions than in the universities, and because there are large differences in research qualifications, priority making is necessary. This fact creates some dilemmas within the individual institutions. First, if institutions with low research activity wish to use more resources for research, this will subsequently result in a reduction of the time used for teaching. The question is whether a transfer of resources from teaching to research is desirable and appropriate in the light of profession-oriented education as the prime function of these colleges. Second, institutional leaders face the dilemma of how big a share of research resources should be allocated based on expected quality or relevance of the research and how much should go towards improving the research competence of the institution's staff. The various country studies show that these resources are distributed in various ways – also within individual institutions.

Recruitment and Development of Research Competence

Human resources are of course a central concern in a research strategy, and there are significant challenges for UASs whose academic staff are often hired to teach, without consideration of research skills or future research activities in mind. Many staff members lack a postgraduate qualification and/or research experience and have limited capacity to attract or compete for funding or produce the requisite outcomes. In most countries relatively few staff members in these institutions have doctoral level qualifications. In addition to recruiting new staff qualified for doing research, an important part of a research strategy would then be to develop research competence with the existing staff, either through formal research training in doctoral programmes or through the participation in research projects headed by experienced researchers. In addition, for institutions without traditions in research, the development of a sustainable research culture is of fundamental importance. These issues are discussed in Chapter 5.

Collaboration with Universities, Research Institutes and Industry

Finally, a research strategy should consider how the institution should enhance closer cooperation with other higher education establishments, research institutes and industry. Cooperation is a central concern in European higher education and research policy, and it is even of greater importance for UASs given their size and limited research capability. Thus development of cooperation at all levels should be a central concern for research strategies. In some domains, forms of cooperation could even be the only possibility for developing or maintaining research in an institution. As shown in the national case studies, forms of collaboration with other research establishments, industry and regional stakeholders vary greatly between countries and between domains.

Conclusion

In this chapter, we have provided an overview of the main issues related to the research mission of higher education institutions that are not part of the university sector. For matters of convenience, we have used the term ‘the UAS sector’ as a common label for this part of the education system because ‘universities of applied sciences’ is the official English name of these institutions in four of the countries included in this book (Germany, Switzerland, Finland and The Netherlands).

The binary divide between a university sector and a UAS sector has in itself been the basic premise for the different roles research is supposed to play in the two sectors: as a major task for universities and as a minor activity compared to education in UASs. In addition, universities should have a major responsibility for fundamental research and the training of new researchers, while UASs should concentrate

on applied research with relevance for the region and professional practice in those occupations for which they educate students for a future career.

In order to better understand the increasingly important role of research in the UAS sector, we introduced the notion of *research drift* and developed an analytical framework which places this sector within a context constituted by state authorities, supranational organisations, societal stakeholders and academia. We argue that there is a drift towards developing research as an ordinary activity alongside teaching and that this development is driven by mutually reinforcing processes consisting of activities taking place within the UAS sector itself and decisions, initiatives and pressures by the four external actors mentioned above.

As will be demonstrated in this book, there are differences between countries included when it comes to how far the process of research drift has come. However, in all countries there is a political concern to further develop UASs as research institutions, though with a different mission and with less resources than the traditional universities. The various chapters in this book also demonstrate that UASs face large challenges in their efforts to enhance research activities and that national and institutional research strategies vary greatly between countries. Research drift in the UAS sector implies challenges and dilemmas that have no simple solutions, and the various countries included have chosen different paths. In the concluding chapter, we will discuss the main open issues and options which are likely to shape the future of research in these institutions.

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