

Globalisation or Europeanisation? International Contact among University Staff

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Abstract

The article examines whether the increase in international contacts among university researchers is an impact of a general globalisation trend, or whether it is an effect of policy initiatives on national and supranational levels such as EU research programmes. The present study demonstrates that the sheer volume of international contacts among Norwegian university staff has increased substantially during the last 20 years with respect to *conference participation, guest lecturing, study and research visits, peer review work, research collaboration and international publishing*. While patterns of international visits have not changed with respect to geographical pattern, research collaboration and co-authoring has become increasingly directed towards other European and Nordic countries. Moreover, we demonstrate a homogenisation between fields of learning regarding the degree of international contact, but there are significant differences in geographical orientation. We conclude that general trends of globalisation and regional policy initiatives from the EU are supplementary rather than contradictory with respect to international contacts among Norwegian university staff. Data are drawn from studies based on questionnaires carried out in 1981, 1991 and 2000 among all tenured faculty members of Norway's four universities.

Key words: co-operation, disciplinary differences, Europeanisation, EU, globalisation, international contact, internationalisation, research collaboration, university staff.

Introduction

An important characteristic of research and higher education is the long tradition of activity across national borders. General globalisation trends as well as political initiatives to stimulate academic contact and collaboration indicate that the internationalisation of research has increased. Even though globalisation is a central topic in higher education literature, there is a lack of empirical evidence of the extent to which different types of international contact among university researchers has changed. This article examines the extent to which international contacts among university staff have changed with respect to intensity, type of contact and geographical scope, and sheds light on the extent to which disciplinary association matters. Internationalisation refers to whether matters pertain to more than one country. By distinguishing between globalisation and Europeanisation this article also analyses two faces of internationalisation.

There are different definitions of the term globalisation, but it first of all refers to a worldwide and systemic process where national economies have become increasingly integrated, interconnected and mutually interdependent (Trondal et al. 2002; Ugland 2002). Not only are universities affected by these trends, it is also argued that they are the engines of globalisation (Castells 1994). While globalisation often is seen as an exogenous and mysterious force outside the control of governments, we argue that Europeanisation represents political dynamics at the regional level of Europe, signifying a blurring and integration of governance dynamics in the EU and the various EU member-states. European governments have intentionally created the possibilities for increased trade in Europe by removing impediments and by implementing rules to govern and encourage trade. The EU higher education programmes, the framework programmes, the research facilities as well as the recent

“European Research Area” (ERA) initiative illustrate that academic collaboration and mobility are important instruments in the development of an European dimension of research and higher education. Hence, processes of Europeanisation differ arguably from processes of globalisation.

International contact among researchers may have a range of different forms. Our conception of international contact involves informal contact as well as formalised contact embedded in various organisational arrangements and mobility schemes. We focus on faculty members’ international contacts in terms of: 1) professional journeys related to conferences, guest lecturing, study and research visits, evaluation work and research collaboration, 2) international and national publishing, and 3) national and international research collaboration. We also differentiate between journeys and collaboration with researchers in other Nordic and European countries, North America and the rest of the world. Furthermore, disciplinary association is examined with respect to international contacts.

International networking presupposes faculty motivation as well as attractiveness among colleagues in other countries (Olsen and Svåsand 1971). Participation in international conferences and study and research visits are not very demanding types of international contact since there are many conferences and venues to visit. Conference participation may, however, be easier to arrange and involves less work than a study or research visit abroad. International publishing implies individual attractiveness since publications are generally assessed by peers. Since the peer review process is frequently anonymous, it does not, however, presuppose visibility. Guest lectures and evaluation work are more demanding in the sense that these presuppose international visibility as well as attractiveness. Research collaboration is generally the most demanding type of international contact

since it presupposes attractiveness, international visibility and often includes significant involvement by the researcher.

Norway is used as a case study. This country belongs to a group of wealthy modern industrial nations; it has only 4.6 million inhabitants and the Norwegian language is not well understood outside Scandinavia. By most standards Norway is a small country. Under these conditions international contacts may be more demanding, for example in terms of language barriers, but at the same time also more important for scientific progress and quality than in larger and more central countries (Kyvik and Larsen 1997). Bibliometric studies show, for example, that small countries are more active internationally than larger nations (Luukkonen et al. 1992; Hakala 1998). This reflects the fact that small countries have modest national research markets, fewer potential partners and facilities, and are thus dependent on a broader international market for publication, conferences, research visits, etc (European Commission 1997, p. 665). Changes in international contact patterns may therefore be more significant in Norway than in many other countries.

Norway is portrayed as a reluctant European (Olsen 1996). It is associate member of the EU through the European Economic Area agreement of 1994 (EEA) and a full member of EU's research and educational programmes. On a regional level Nordic collaboration is, however, given significant attention. Its position as a small country on the European periphery makes Norway a sound case to examine international contacts among university researchers.

Methodologically and empirically, this study applies unique data sets from three points in time: 1981, 1991 and 2000. Hence, we are able to study international contacts over a relatively long period.

Secondly, whereas most studies of international academic collaboration are based on bibliometric data and focus on co-authorships (Kyvik and Larsen 1997), this study applies data at the level of individual researchers and sheds light on different types of contact. Furthermore, most studies are confined to specific disciplines while the present study compares staff across most university disciplines.

It has been argued that globalisation processes in research and higher education are understudied but also under-theorised (Teichler 1996; Welch 1997; Marginson and Rhoades 2002). This study sets out to test three explicit hypotheses about international contact among university researchers and thereby explain the statistical variance unveiled by the survey data. The following section outlines the respective hypotheses on university faculty contacts in the international arena and the theoretical arguments from which these are derived. The next section presents the methodology and data underpinning this study. The third section includes an empirical analysis and discussion of international contacts among Norwegian university faculty members at three points in time: 1981, 1991 and 2000. This empirical analysis is structured according to the hypotheses outlined below. The final section draws the empirical tests to a conclusion.

Hypotheses on international staff mobility

International contacts among researchers reflect a mix of different mechanisms and driving forces. This section outlines three hypotheses. The first hypothesis argues that international contacts reflect the general globalisation trend and that national and regional borders are no longer relevant in scientific communication. The second hypothesis argues that policy initiatives on national as well as

Nordic and European levels significantly affect contact among academic staff on a regional level.

Finally, the third hypothesis claims that disciplinary characteristics imply that globalisation trends as well as policy initiatives do not have the same impact in all fields of learning.

Globalisation

While internationalisation mainly refers to a process of greater co-operation between states, globalisation is used to describe different dimensions of denationalisation and transnationalisation (Scott 1998; Enders and Fulton 2002). In its simplest sense globalisation refers to the widening, deepening and speeding up of global interconnectedness (Held et al. 1999, pp. 14-17). Globalisation refers to developments in the world economy where national economies become increasingly interconnected and mutually interdependent. Large multinational companies have lost their national identities, have access to cross-border information facilities and transportation technologies, and take advantage of cheap labour around the world to expand their markets (Fligstein and Merand 2002; Trondal et al. 2002). Slaughter and Leslie (1997) argue that this global economy has significant impact on universities. Multinational corporations have established relationships with research universities to develop products that will quickly enter the global market. Even though we focus on the results of globalisation on national universities and academic life (contact patterns), the role of multinational corporations is likely to strengthen the competition between universities and researchers for funding worldwide.

Developments in information communication technology play an important part in the globalisation trend because the size, speed and complexity of information increasingly penetrate the daily life of scientists. Globalisation is, therefore, also characterised as a network society (Castells 2000).

Networks signify complex flows of signs, money, information, technologies, machines, waste products as well as people (Urry 1998). Even though universities always have been international institutions, the global networks are assumed to have an impact on national research and higher education (see for example Scott 1998).

In newer models of the international scientific environment a network approach has been applied (Kyvik and Larsen 1997). Network models blur the distinction between scientific centres and peripheries, and the mosaic of international contacts among university researchers is more complicated. Still, the network approach assumes that international contacts cluster around fairly stable networks of actors, disciplines, paradigms and research programmes. A more recent conception of the international scientific environment views this as a market place where actors “shop” around without any stable patterns (Kyvik and Larsen 1997). Networks and clusters of research milieux might still exist, but these are less stable and more contingent. Globalisation implies a move away from classical centre-periphery models towards network and market models. Contact and collaboration patterns between researchers are assumed to increase, and clusters become more worldwide.

Europeanisation as regionalisation

Globalisation of contact among researchers denotes contact and collaboration within the European region. Generally, regions may be considered as buffers towards the global competitive markets but also as supporters of global co-operation and competition (Wallace 2000). We argue that international staff mobility is fostered by the policies of national and supranational institutions. In contrast to the classical *laissez-faire* model of *free movers*, organised international contact and

collaboration is likely to increase due to the political and administrative attention that is devoted to it. Whereas the classical model conceived contact as a basically individually driven activity, the model of organised mobility has reduced the individual discretion considerably. Research funding from international and supranational organisations often accompanies expectations and obligations of international research visits, conferences, study visits, etc.

Most European countries have developed explicit strategies to internationalise higher education in the 1990s (van der Wende 1997; Teichler 1998). This is also the case for Norway, where the policies for higher education and research have become increasingly Europeanised in the 1990s (Trondal 2002). Norwegian authorities have put increased emphasis on international collaboration and academic mobility in general and towards Europe in particular (see for example St.meld. nr. 27 (2000-2001)).

The 1990s have also witnessed the emergence of international institutions that encourage, support and finance international staff mobility. The advent of emerging supranational policies of higher education and research at the EU level in the 1990s has supplemented the *free movers* with international collaboration schemes. We assume that the EU Framework Programmes, the EU research facilities as well as the recent “European Research Area” (ERA) initiative have spurred an institutionalisation of international staff mobility in Europe. Accordingly, we expect that Norwegian researchers have become increasingly oriented towards Europe during the last twenty-years.

Furthermore, research funding has increased on the Nordic scene as the Nordic Council and the Nordic Council of Ministers have strengthened their support of Nordic research collaboration. One

concrete expression of such efforts is NorFa (*Nordisk Forskerutdanningsakademi*). Established in 1990, NorFa is a co-ordinating institution for research training in the Nordic countries. One of its core functions is to support inter-Nordic collaboration and mobility of researchers through conferences, scholarships, etc. Accordingly, we expect Norwegian researchers to become increasingly active on the Nordic scene.

Disciplinary characteristics

Different disciplines might have different levels of international contact. More precisely, the so-called “hard” sciences are often assumed to be generally more internationally oriented than the “soft” sciences (Kyvik and Larsen 1997). “Hard” and “soft” disciplines are characterised by degree of paradigmatic status and consensus (Becher 1989; Braxton and Hargens 1996; Smeby 2001). To understand disciplinary differences in international communication patterns the nature of research subjects and audience structure is of particular relevance (Kyvik 1991; Kyvik and Larsen 1997). Some disciplines are global in the sense that research results are not influenced by the country or region where the research is undertaken. Experimental physics is one example of such a discipline. On the other hand some research subjects are situated in a social, cultural, biotopical and geographical context that makes the research results particularly regionally oriented. Such research subjects are more often found in soft than in hard fields. A national and regional lay audience is also more common in the former than the latter field. It is therefore reasonable to assume that the level of international contact varies accordingly between the hard and soft disciplines.

Data and method

This study is based on survey data among all faculty members of the rank of assistant professor or higher at Norway's four universities at three points in time: 1981, 1991 and 2000. The number of respondents in these surveys was 1585 in 1981 (79 per cent), 1815 in 1991 (69 per cent), and 1967 in 2000 (60 per cent). We see a slightly declining response rate over time, partly reflecting a general overload of surveys of different kinds in society. However, a 60 per cent response rate is very good when compared to other studies internationally. We categorise the faculty members into the five fields of learning: humanities, social sciences, natural sciences, medicine and technology. This categorisation is conducted according to the guidelines for the R&D statistics suggested by UNESCO (1978). The 1981 study does not, however, include technology.

In all three surveys faculty members were asked to report destinations for professional journeys abroad in connection with conferences, guest lectures, study and research periods, peer review/evaluation work, and research collaboration. The latter type of visit was not a separate category in the 1981 survey. Journeys are, however, mainly analysed as a single dichotomised variable (conducted international journeys or not). Since research collaboration does not have to include visits abroad, data on research collaboration with researchers in their own department and in other countries in the previous three-year period is examined. These variables are only available for the two latter surveys. Finally, data on faculty members' scientific publishing is analysed. More in-depth discussions on these variables and data sets are provided in Bie (1985), Kyvik (1991), Larsen (1992), Kyvik (2001), and Trondal and Smeby (2001).

International staff mobility in a changing world

As indicated above, international staff mobility is measured according to five types of professional journey: participation in international conferences, guest lecturing abroad, international visits for study and research, international peer review work, and finally, research collaboration. Generally, international research collaboration might be considered the most demanding type of contact, while conference participation is the least demanding.

Figure 1 here

Figure 1 shows that there has been a substantial increase in all types of professional journey from 1981 to 2000. Moreover, the degree of international contact has increased slightly over time; the increase in international journeys is somewhat stronger in the 1990s than in the 1980s, and stronger in the 1980s than in the 1970s (c.f. Bie 1985). Despite the advent and rapid development of electronic publishing facilities and computer-mediated communication, personal contact seems to have become increasingly important. One reason may be that these types of contact are mutually reinforcing. Existing research does not confirm whether the advent of ICT has had any effect on research mobility (Nordic Council of Ministers 2001, p. 47).

International travel among Norwegian researchers is first of all related to conferences and to research collaboration. Moreover, from 1991 to 2000 the degree of international contacts that relates to international research collaboration has increased more than the other forms of international travel. The different types of international travel are, however, interrelated and seem also to be mutually

reinforcing. There is significant correlation between the different types of journey (Trondal and Smeby 2001).

The increase in journeys related to research cooperation seems only partly to be due to a general increase in research collaboration. International research collaboration increased by 18 per cent in the period while journeys related to international research collaboration increased by 67 per cent. In 2000, international research collaboration equals the research collaboration conducted within faculty members' own department. A differentiation may be made between *cosmopolitans* oriented towards an external reference group composed of researchers in their discipline, and *locals* oriented towards their colleagues and their own institution (Gouldner 1957a, b). Our data contests this distinction. We observe a positive correlation between international research collaboration and research collaboration at the national level (Trondal and Smeby 2001). Whereas some researchers tend to be fairly active in research collaboration both nationally and internationally, others tend to be less active in both arenas.

Data on scientific publishing confirms our observations of growth in international contacts among university researchers; the volume of international publishing has increased over time. During the two decades considered here the proportion of Norwegian scientific publications in English or another foreign language has risen from 62 to 71 per cent and the proportion of faculty members who published at least one publication in a foreign language has risen from 65 to 80 per cent (Kyvik 2001). Moreover, we also envision a growing "multi-national" co-authoring in Norway as well as in other countries (European Commission 1997, p. 663; Research Council of Norway 2001, pp. 142-147).

Globalisation or Europeanisation?

This section examines the impact of globalisation and policy initiatives to increase European and Nordic contact and research collaboration. While the Globalisation hypothesis anticipates a general trend towards increased worldwide contacts and collaboration, the second hypothesis expects us to observe an “Europeanisation” and a “Nordification” of these patterns.

Figure 2 here

Figure 2 shows that there has been a significant increase in international travel among faculty members to all the geographic regions. The overall increase is about 20 per cent in the period 1981 to 2000. The relative increase is highest for travel to North America and the rest of the world since these regions are less frequently visited.

Table 1 here

However, Table 1 shows that research collaboration is increasingly directed towards regions outside North America. Our data point towards an increased European *and* global orientation. Two-thirds of Norwegian faculty members reported that they collaborate in research with colleagues in Europe, including the Nordic countries. Bibliometric data shows that the proportion of articles co-authored by Norwegian and North American researchers has declined, particularly in the 1990s, while the proportion co-authored by Norwegian and European researchers has increased (Research Council of Norway 2001, pp. 145-146)

The Europeanisation of research collaboration and co-authorship may reflect the impact of EU research programmes as well as Norwegian policy to increase this type of research collaboration. From 1994 to 2000 the finance over the Norwegian State Budget and the Norwegian Research Council to the EU Framework Programmes almost tripled. Moreover, increased Nordic research collaboration may be a reflection of the EU Framework Programmes as these projects frequently also include Nordic colleagues. Bibliometric data confirm this assumption (Research Council of Norway 2001, pp. 135-146).

The increase in research collaboration directed towards countries outside Europe and North America may be part of the general globalisation process. But it may also be a reflection of policy initiatives and programmes at the national as well as at the EU level towards developing countries. For example, the Norwegian Council of Universities initiated a programme financed by The Royal Ministry of Foreign Affairs in 1988. At the university level several bilateral agreements have been established with universities outside Norway.

Formalised programmes and financing schemes seem to have a more significant impact on research collaboration than on travel. Faculty members seem to travel more than ever worldwide to meet colleagues. The globalisation and Europeanisation hypothesis seems therefore to be supplementary rather than contrary. While contact patterns seem to be increasingly globalised, North America has become relatively less important in research collaboration due to the regional focus of most national and supranational policy initiatives and research programmes.

Disciplinary differences

According to the third hypothesis we expect international contact and collaboration to be more common in hard than in soft fields of learning due differences in the degrees of global and local research subjects. Figure 3 shows that visits abroad have increased in all fields of learning, but there is also a tendency towards homogenisation. While faculty members in medicine travelled abroad more frequently than their colleagues in other disciplines at the beginning of the period, there are no significant differences between these fields at the end.

Figure 3 here

There are nevertheless still significant disciplinary differences in publication patterns. In the hard fields the great majority of publications are written in languages other than Norwegian. The internationalisation of publication language has been somewhat stronger in the social sciences than in the humanities, but even in the social sciences only half of the publications are written in a foreign language at the end of the period under study. The harmonisation tendency is, however, somewhat stronger if we look at the proportion of faculty members who published at least one scientific publication in a foreign language. This proportion increased from 44 to 63 per cent in the humanities, from 49 to 73 per cent in the social sciences, but from 80 to 89 per cent in the natural sciences and 84 to 88 per cent in medicine (Kyvik 2001).

The proportion of faculty members who reported international research collaboration varies significantly between fields (Table 2). Faculty members in the humanities collaborate least with researchers in other countries, while the natural scientists collaborate most. These differences largely

correspond to the general pattern in the extent to which faculty members collaborate in research. In this type of international contact there also seems to be a tendency towards harmonisation between the fields.

Table 2 here

Looking at the geographical pattern, we observe some significant differences between the academic fields. In the humanities, the social sciences and medicine, faculty members have just as much contact with researchers from the Nordic countries as with researchers from the rest of Europe. In the other fields Europe is the most important region. Even though North America ranks as third in all fields, most contact with North American colleagues is found among faculty members in the natural sciences, medicine and technology and least in the humanities. Faculty members in technology have more contact with researchers outside Europe and North America than their colleagues in the other fields.

The importance of Nordic contacts in the humanities and the social sciences probably reflects the relative importance of local and national research in these fields. In this perspective, Nordic contacts are more regional than international, largely focusing on issues of Nordic interest. The regional contacts in the other fields may be explained by differences in the geographical distribution of excellent and relevant research centres. The relative importance of Nordic contacts in medicine, for example, may be an impact of the international position of Swedish medical research.

Correspondingly, North America has a more central position in the hard fields than in the humanities, and Asia is especially important in technology. The relatively low importance of contacts with

colleagues outside Europe and North America among faculty members in the humanities may, on the other hand, be an impact of the low level of research collaboration based on policy initiatives towards developing countries.

Our data demonstrate that internationalisation has increased in all fields. Furthermore, we observe a harmonisation in the degree of internationalisation over time between fields of learning. It seems to be difficult to concentrate on a national audience when communication in general has become increasingly internationalised. On the other hand, geographical contact patterns differ significantly between fields. The globalisation as well as the Europeanisation hypotheses, therefore, have to be supplemented with a discipline perspective.

Conclusions

International contacts and collaboration among university faculty members are complex processes affected by political initiatives as well as collaborative and competitive characteristics of the international scientific communities. Developments in information technology seem to stimulate and supplement traditional types of international contacts rather than replacing them. There has been a significant increase in different types of travel to all parts of the world. Personal contact between researchers worldwide seems to be more widespread than ever.

The general patterns of contacts and research collaboration hold for all fields of learning. At present no important difference between fields of learning is found concerning the extent of international travel. Furthermore, disciplinary differences in international research collaboration seem to reflect

differences in research collaboration in general. There are nevertheless differences in publication languages and contact patterns with various geographic regions. Even though there is a general tendency towards homogenisation between fields of learning, disciplinary differences and relevance criteria have to be recognised. In a global network society clusters of actors within disciplines, paradigms and research programmes are also to be found.

Funding and programmes on national and supranational levels seem to be successful in terms of stimulating research collaboration in Europe. Research collaboration is not only the most demanding type of contact between researchers; it is also the most important because it involves the entire research process. Even though researchers in North America still hold a central position as partners, policy initiatives in Europe seem to have changed the research landscape significantly. Research collaboration has been Europeanised, even though research collaboration with researchers outside Europe and North America also has increased.

Our data nevertheless supports the globalisation hypothesis. Contact patterns in general do not indicate that any specific geographic region has become more privileged than others. While markets and politics tend to be treated as contradictory dynamics of change, a study of the world economy and the EU single market suggests an intimate link between politics and market dynamics (Fligstein and Merand 2002). Correspondingly, our study indicates that European initiatives and globalisation processes are not contradictory but closely interrelated. A central basis for international research collaboration is local and regional visibility (Kyvik and Larsen 1997). Less demanding types of international contacts such as conference participation may be a first step to more demanding types, for example being invited as guest lecturer and being regarded as an prestigious collaborator in

research projects. Correspondingly, visibility of individual researchers as well as research groups at a national level may be a first step to visibility at regional and finally at global levels. It is reasonable to assume that programmes and funding to simulate contact and research collaboration on a regional level like the EU fortify the visibility of researchers involved in these projects. Such policy initiatives are therefore likely to have an impact on the development on research networks worldwide.

On the other hand, the so-called Matthew Effect in science may also imply a greater stratification and segmentation of contacts and collaboration among researchers where established scientists become increasingly involved in international networks, while others fail in their initiatives (Geuna 1998). It is also argued that globalisation will be detrimental to higher education in small countries and minority language areas. In small and poor countries universities will have little competitive potential (Altbach 2001; van Vught et al. 2002). Regional networks may be part of such a stratification process.

Therefore, the Europeanisation of Norwegian research collaboration could be an impact of scientific stratification and segmentation. The significant increase in international contacts and research collaboration among Norwegian university faculty do not support this hypothesis.

The present study is based on data on Norwegian faculty members. We have argued that these data are of significant interest in studies of the internationalisation of research since international contacts are more extensive in small countries. Our conclusions on Europeanisation versus general globalisation are necessarily preliminary in their findings. The tendencies demonstrated in the Norwegian case may, for example, be different in larger countries. Furthermore, there are significant differences in the level of international involvement among academics in industrialised countries, which may not reflect country size. Also factors like research culture and research facilities influence

faculty members' international collaboration patterns (El-Khawas 2002). The relationship between Europeanisation and globalisation may also be different in EU member-states and in non-member states. Future studies could well be focussed on comparative analyses of the tensions between globalisation, regionalisation and the stratification of scientific communities.

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Tables and figures

Table 1: Per cent of faculty members having research collaboration with foreign scientists during the period 1989–1991 and 1998–2000, by geographical region.

	Nordic countries	Rest of Europe	North America	Rest of the world	(N)
1989-1991	33	40	32	13	(1815)
1998-2000	45	50	33	19	(1967)

Table 2: Per cent of faculty members having research collaboration with foreign scientists during the period 1989–1991 and 1998–2000, by field of learning.

	Humanities	Soc. science	Nat. science	Medicine	Technology	(N)
1989-1991	43	46	69	58	67	(1815)
1998-2000	55	61	77	65	70	(1967)

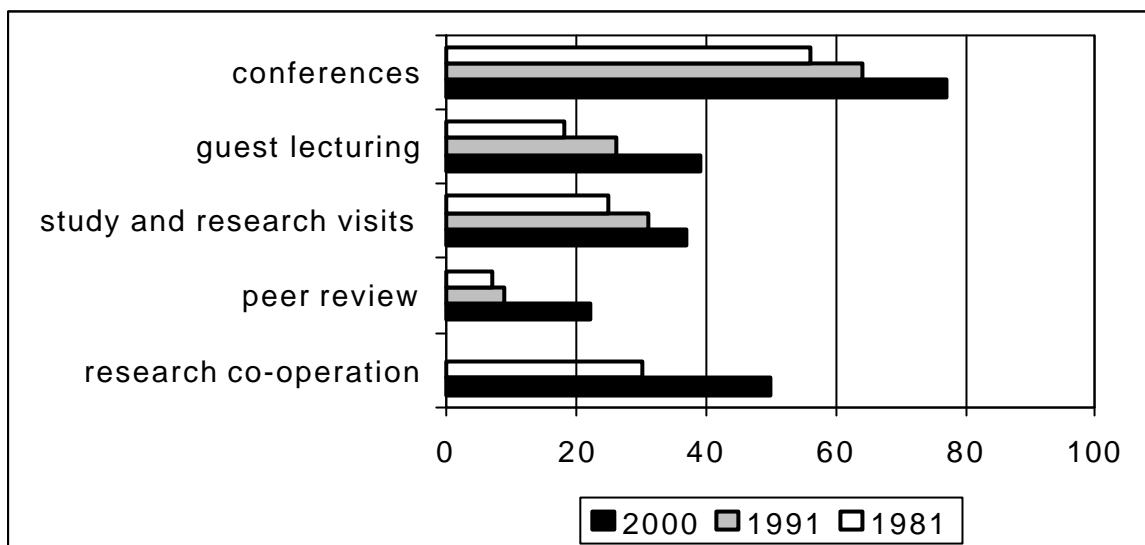


Figure 1: Per cent of faculty members who undertook at least one journey abroad related to conferences, guest lecturing, study and research visits, evaluation work and research collaboration in 1981, 1991, 2000.

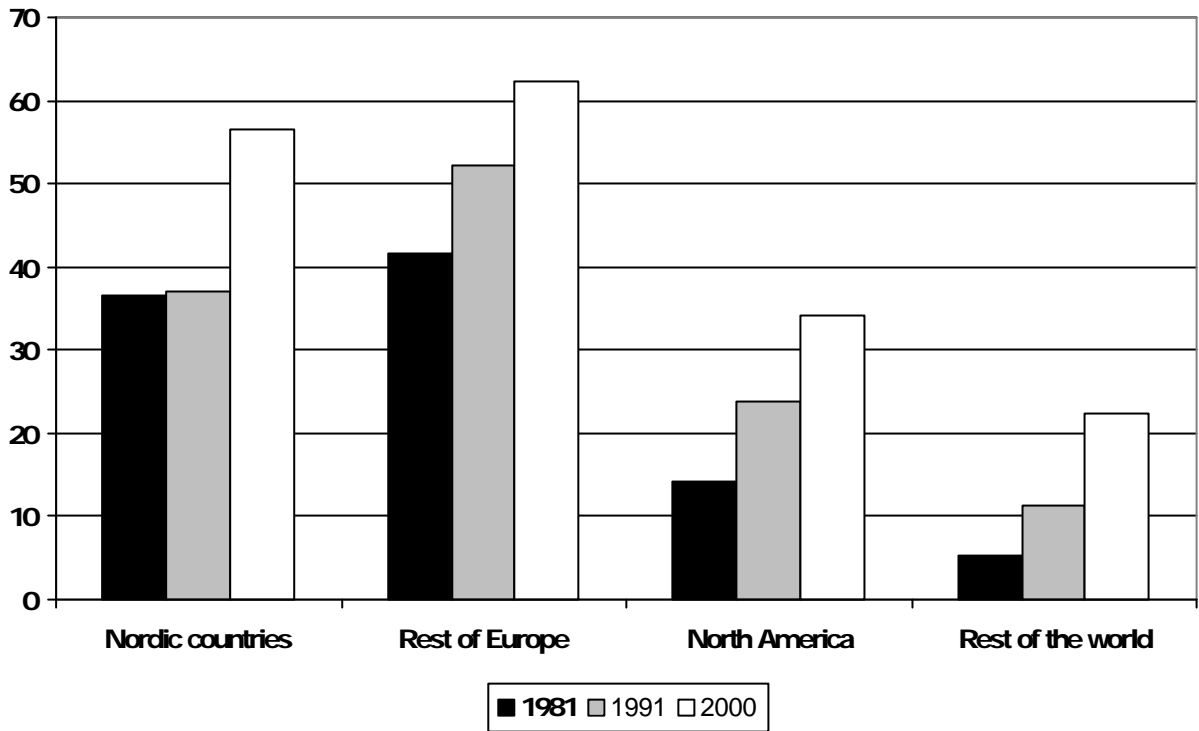


Figure 2: Per cent of faculty members' journeys abroad for professional reasons in 1981, 1991 and 2000, by geographical region.

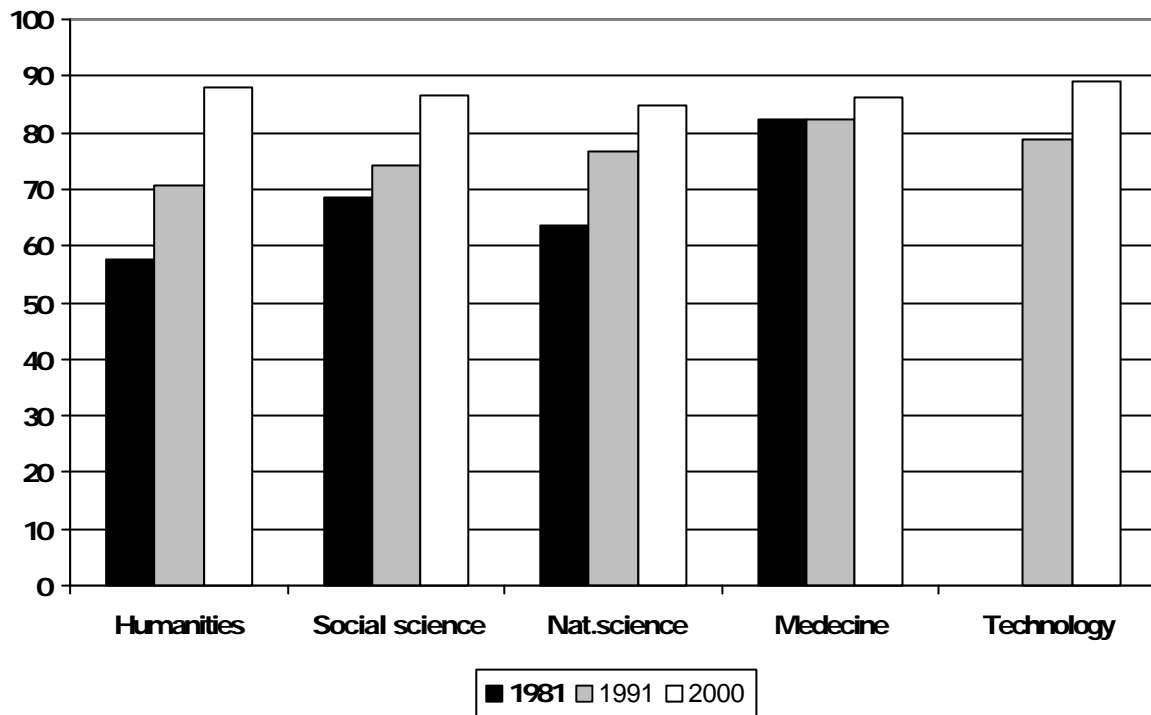


Figure 3: Per cent of faculty members who undertook at least one journey abroad for professional reasons in 1981, 1991 and 2000, by field of learning.

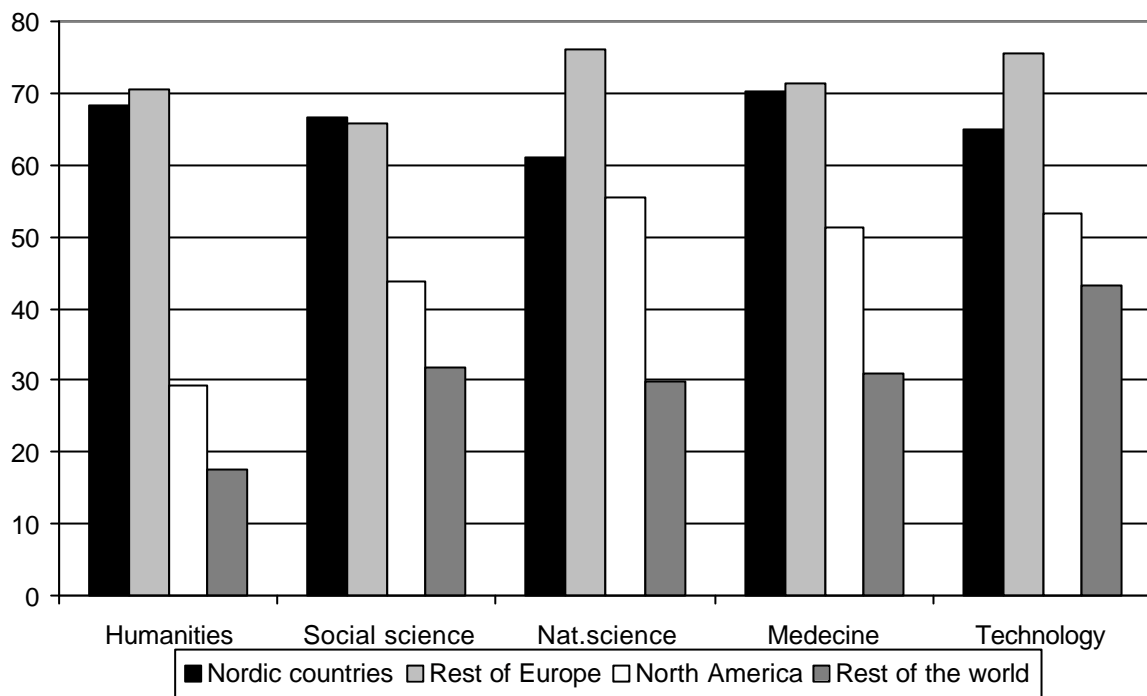


Figure 4: Per cent of faculty members' contacts (journeys 2000 and research collaboration 1998–2000) in different geographical regions, by field of learning.

Figure legends

Figure 1: Per cent of faculty members who undertook at least one journey abroad related to conferences, guest lecturing, study and research visits, evaluation work and research collaboration in 1981, 1991, 2000.

Figure 2: Per cent of faculty members' journeys abroad for professional reasons in 1981, 1991 and 2000, by geographical region.

Figure 3: Per cent of faculty members who undertook at least one journey abroad for professional reasons in 1981, 1991 and 2000, by field of learning.

Figure 4: Per cent of faculty members' contacts (journeys 2000 and research collaboration 1998–2000) in different geographical regions, by field of learning.