

---

**Foreword**

---

**Proceedings of the 4th Nordic Workshop in Bibliometrics  
Copenhagen (Denmark), August 27-28, 1999**

IRENE WORMELL

The metrics of science has great traditions in the Nordic countries. The field, however, has in the last decades been dominated by the immediate interests of science policy and planning at the cost of the establishment of fundamental, methodological and experimental research programmes.

This pattern in the development of the field, unfortunately, is well known in several other regions too. Thanks to the initiatives of some scholars at the various Nordic universities in the beginning of the 1990s, interest was raised to integrate the bibliometric methods in interdisciplinary research approaches, and to promote fundamental theoretical and experimental developments in the use of quantitative analysis.

The results of these activities have generated a renewed interest for bibliometrics also at the library and information science study programmes, supported by the development of new advanced tools and techniques in the field in information retrieval. Due to the increasing interest in information technology and the applicability of new analytical software in advanced information services, since the mid nineties there has been a vital interest among the younger generation of researchers to combine bibliometric methods with other types of analysis in a strategic mix, e.g., text and data mining.

The use of quantitative analysis is now also moving towards the “soft” domains of science to reduce subjectivity in domain analysis, as well as to support “informed decision making” and to gain social and business intelligence .

The establishment of the Centre for Informetric Studies at the Royal School of Library and Information Science in Copenhagen in 1997 should also be seen in the light of these developments.

In the last years it has become an important tradition among the Nordic bibliometricians and scientometricians to keep in touch and to get together once a year for a week-end workshop. This event usually takes place at the end of August in one of the Nordic countries according to a fixed schedule. Last Summer it was Denmark's turn to host this traditional event, and the Centre for Informetric Studies in Copenhagen had the responsibility to call for papers and to invite researchers and practitioners to the 4<sup>th</sup> Nordic Bibliometric Workshop.

As usual, the number of participants was around 20, most of them working in research evaluation. The very positive development in the field is that this last workshop attracted several young researchers from various fields. There were many good quality papers coming from university research environments as well as from the application areas (research policy, research evaluation, research management, innovation studies, etc.). The presentations demonstrated a growing interest in using bibliometric methods not only in research evaluation, but also in the analysis of the Web and to assist managers in the fast moving business areas. It was obvious that the young researchers are using bibliometric methods in a creative way – not only in the fields of S&T but also in the social sciences and in several other related disciplines.

Many of the papers presented already had been submitted to other journals at the time of the workshop, therefore, the selection of papers in this issue of *Scientometrics* represents only a sample of the Nordic research approaches in the field.

With the support of NORDINFO, we were able to invite *Wolfgang Glänzel*, one of the leading European scientists of the field, who in his key note speech gave an excellent presentation on “Science in Scandinavia: A bibliometric approach”. The extended version of this paper is published here as the first article in this issue. His findings provide information about the main characteristics of Scandinavian research as a coherent cluster in the international platform, but he also discusses the more specific characteristics of each of the four individual countries. The study covers the 1980-1997 period and highlights the trend that Scandinavia is changing from a region with predominant activity in life sciences to a region representing a more balanced “western profile”.

*Martin Meyer's* paper aims to contribute to a better understanding of patent citation analysis in general and its application to novel fields of science and technology in particular. His study concern the reciprocal relationship between science and technology and patent citations, which is seen as an indication of the loci of that cognitive interplay. In the second part of the paper the patent citations in nano-science and technology are analysed in terms of interfield and organisational knowledge-flows.

The paper of *Ingrid Pettersson, Anna Nilsson and Anna Sandström* is related to the innovation system approach developed during the last decade in Sweden to look at systems of innovation from a national perspective. This approach has been used in the analysis of the Swedish biotechnology innovation system carried out at NUTEK (Swedish National board for Industrial and Technical Development), the Department of Technology Policy Studies. The paper presents some of the findings of the bibliometric analysis related to publication pattern, extent of collaboration and interdependence between the public research organisations, collaboration pattern between firms and academic groups, co-authorship networks of the actors in Sweden and organisations in other countries etc. Complemented with other data, bibliometrics has been a useful tool in studying the systems of innovation in such a research intensive field as biotechnology. Because of its strong dependence on a few large pharmaceutical companies, the problem of vulnerability in the Swedish biotechnology innovation system is also discussed.

*Irene Wormell* presents the results of an extensive informetric analysis of the Welfare State both as an international research phenomenon and as a current debate issue in Denmark. Because of the extensive volume of the material the presentation is divided into two separate articles. The research project aims to develop and improve quantitative analysis based on informetric methods in the field of social sciences and humanities with emphasis on the use of online databases as analytical tools. The presented methods and findings are intended to stimulate and help researchers in opening up new perspectives for accessing information and for discovering knowledge in the retrieved bibliographic data.

The first article analyses the developments of the basic theoretical and empirical concepts of the international Welfare research through three time series 1974-81, 1982-89, 1990-97, using the technique of co-ordinated online searches in a cluster of core international databases.

The second article is based on the three main points in the present criticism of the Welfare State in Denmark, focusing on the economic, legitimacy and functionality aspects: Can we afford it? Does the public believe in it and how much do they support it? How does it work?

The study was designed to test the usability of the issue tracking method in a so called "soft" disciplinary area: the complex issues of the modern Welfare State are tracked through various types of national databases containing information about research, application and practice, press/media, and legislation. The aim is to unearth significant past and current trends and developments in public opinion, to explore the deeper segments of the debate and to eliminate subjectivity in domain analysis.

The presented Nordic papers cover a wide range of the bibliometric research field, providing a sample of current theoretical, applied and methodological research approaches. The utilisation of the bibliometric methodology is mainly applied to research evaluation, but there is an emerging area where it is embedded in the theoretical and methodological developments of information retrieval and the advanced use of online databases for obtaining, measuring and processing analytical data to gain social and business intelligence.

---

*Address for correspondence:*

IRENE WORMELL  
Centre for Informetric Studies,  
Royal School of Library and Information Science,  
Birketinget 6, DK-2300 Copenhagen (Denmark)  
E-mail: iw@db.dk