

ISSI 2005 Doctoral Forum

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Introduction

For the first time a Doctoral Forum is being held as part of the ISSI 2005 conference in Stockholm. The Forum is a one-day event taking place before the main conference on Sunday, July 24, and it is inspired by those held at the CoLIS4, CoLIS5 and SIGIR 2004 conferences¹.

The purpose of the Forum is to provide doctoral students with an environment in which to discuss their research projects with senior researchers and other doctoral students. An important motivation in the establishment of the Forum was to facilitate the interaction between students and experienced researchers in the field, in particular for those students who rarely get a chance to do so. In addition, the Forum is an opportunity for the doctoral students to set up contacts with other students at the same stage as themselves.

Participating students were selected by the Forum chairs based on a four-page paper describing their doctoral research project and their motivation for participating in the forum. In this first year we received 15 applications, of which 14 were accepted. The student participants study in eight different countries, and represent a broad range of perspectives as demonstrated by the abstracts on the following pages. Six senior researchers experienced in different subfields of Scientometrics and Informetrics will give feedback to the students and discuss their projects with them, based on their papers and presentations at the Forum.

We wish like to thank the Programme and Conferences Chairs for encouraging us in the development of a Doctoral Forum at ISSI, and to thank Dr. Pia Borlund for valuable advice. We hope that the Forum will become a permanent event at the biannual ISSI conferences, and that it can contribute to the development of new researchers in the field and thus to the continued growth of the international community of Scientometric and Informetric researchers. Already most of the students have chosen to participate in the main conference and several will be presenting papers and posters.

Finally, as chairs, we would like to give our sincere thanks to the senior researchers for their efforts involved in participating in the Forum. They are:

Judit Bar-Ilan, *Bar-Ilan University, Israel*

Katherine McCain, *Drexel University College of Information Science & Technology, USA*

Bluma Peritz, *Hebrew University of Jerusalem, Israel*

Ronald Rousseau, *Catholic School for Higher Education Bruges-Ostend (KHBO), Belgium*

Henry Small, *Thomson Scientific, USA*

Mike Thelwall, *University of Wolverhampton, UK*

¹ See <http://colis.ischool.washington.edu/phdforum.htm>, <http://www.cis.strath.ac.uk/external/colis5> and <http://www.sigir.org/sigir2004/doccon.htm>.

A Webometric Study on the Scientific Output (Patents) in Medicine fields During 1965-2000

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The emergence of the internet has turned our world into a global village and the globalization conditions have provided the collaboration and relationship between scientists and researchers. The result of this scientific collaboration and communication has made an impact on the quantity and quality of scientific output within both the electronic environment and paper form.

Bibliometric is a well-known method used to evaluate the scientific output of scientists. This research is used to evaluate the quantitative of scientific output of scientists and researchers of medicine fields (patents) and illustrates the trend of scientific output within patent-holding countries during 1965-2000. This method will be used to determine the most productive area amongst the medicine fields and the least productive. The database of United States National Library of Medicine (MeSH Major Topic Tag) will be searched.

Knowledge Hubs and Co-authorship Networks of Nanoscience Applications in Development of Solar Cell Technology

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Contemporary science and technology policy targeting a strong infrastructure for innovation advocate a dual goal to, not only develop capabilities in relevant scientific fields, but also utilise opportunities arising from synergies between different science and technology areas. This paper is concerned with such interaction between advances in nanoscience and technology with applications in environmentally compatible energy technology, in development of solar cell technology. The research approach is based on bibliometrics and social network analysis (SNA) with special emphasis on international knowledge networks and measures of network characteristics, such as network centrality and density. Analysis of scientific publications, retrieved using key words and citation approach, show an increase of publications in the area of nanostructured solar cells. Also the level of citations of one of the highly cited seminal papers from the early 1990s is steadily increasing. The co-authorship analysis reveals patterns of substantial domestic and local interaction, but also identifies a set of international network hubs of leading science localities within the area of nanostructured solar cells.

Identifying Effective Factors on the Level of Information Visibility for End Users on the Web Environment

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This is a user-oriented research with a qualitative approach about end users' interaction with web-based search tools in general and their perceptions of the invisible web in particular. The research aims to develop a new information searching model which is capable of addressing the concept of information visibility on the web and explaining users' search behaviour on the web regarding their feelings, thoughts and reactions after receiving poor search results. One of the key terms in this study is the "Invisible Web" which includes the information resources that general-purpose search engines do not or can not retrieve. The early research questions were focused on users' awareness of the invisible web. However, carrying out a pilot study led to emergence of new directions and the final questions formulated to address how users conceptualize their information seeking failure on the web and how they seek to cope with retrieval failure. In the first phase of the main data collection a sample of academics were interviewed. The early analysis indicated that feelings of failure in web searching are highly dependent on the search context. The search context includes a large number of elements including search aim, search topic, search importance, time allocation etc.

Enabling Innovation Through Engineering: The Other Face of Public SCIENCE?

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The growing demand for industrial relevance in public science has brought about an overemphasis on the commercialization of university research, which is in conflict with the case for publicly funded basic research and therefore calls for an informed discussion of the role of universities in the contemporary research system. Drawing on bibliometric and qualitative data, I maintain that much university research, which is labeled as applied research, is more adequately characterized as engineering research, which should be firmly disassociated from the concept of applied research because it is critical in understanding how universities contribute to the advancement of science and technology. Universities possess the breadth of competences necessary to address complex, multidisciplinary research fields and are able to pursue the open-ended research questions necessary for bridging fundamental and applied research, effectively creating a joint problem-solving space for public and private science. I argue that universities possess a comparative advantage in both basic and engineering research, and an extension of the rationale for the public funding of science to include both forms of research is proposed. Implications for the design of policy mechanisms that respect and support the specialization and division of scientific labor that underlie university-industry collaboration are explored.

Ways of Adequacy of Brazilian Scientific Production Evaluation: International Versus National Impact Factor

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The extreme emphasis in the use of JCR impact factor (IF) to evaluate scientific production, at the level of funding agencies, institutions and individuals, has privileged the “high impact” journals, even at the context of developing countries. Regional databases, representing the local research context, can offer an additional element to minimize this bias. This project tests the SciELO database on measuring impact of Brazilian scientific productivity, using journals indexed in SciELO and/or ISI databases, as well those journals not indexed in none of these. Furthermore, it aims to evaluate SciELO database capability on offering other set of information related to its journals, affording to complement the studies of performance evaluation of scientific journals.

Bibliometric Analysis of Patterns of Authorship in the Biomedical Literature on Nigeria

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The study was carried out to analyse the patterns of single and multiple authorship of Nigeria’s biomedical publications, examine the impact of co-authorship on the productivity of biomedical scientists, model the probabilistic distribution of authorship in the field, and also fit the growth model for the literature during 1967-2002. The significance of this study lies in ability to supply useful information in judging Nigeria’s standing in biomedicine. This study relied on *Medline* of the National Library of Medicine.

The analysis showed that 2184 authors, with 151 disciplinary affiliations, used 295 different journals and related sources to produce 6820 articles with 223,461 (complete credits). This yielded 3.15 articles per author, 3.44 credits per article and overall collaborative coefficient (CC) of 0.631. Generally, single authorship accounted for 23.6% of the articles while co-authorship accounted for 76.4%. Virology has the highest coincidence of co-authorship with author-article ratio and collaborative coefficient ranging of 3.90 and 0.59 while Biochemistry had the lowest with author-article ratio and collaborative coefficient of 2.46 and 0.31 respectively. Nigerian and other African journals constituted the major sources of the articles, although they also carried the least co-authored articles, in contrast with non-African journals, which contained more co-authored articles.

An Informetric Analysis of Hiv/Aids Literature in Eastern And Southern Africa, 1980-2005

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The study uses both descriptive and evaluative informetrics to analyze HIV/AIDS research in and/or about Eastern and Southern Africa, between 1980 and 2005, using the published literature as indexed and reflected in three key bibliographic databases, namely, Science Citation Index (SCI), Social Sciences Citation Index (SSCI) and AIDSLINE. Basically, four analytic approaches are employed to: (1) analyze the nature, type and trend of co-authorship patterns in order to evaluate the trends and types of collaboration in HIV/AIDS research; (2) study the authors' productivity and citation impact so as to measure their influence and more particularly, the Eastern and Southern African HIV/AIDS researchers' visibility and impact; (3) study the informetric characteristics of HIV/AIDS sources of information [source publications] in order to determine the international visibility of research activities on these countries as well as evaluating the eastern and southern African sources' visibility in key bibliographic databases; and to (4) assess the publishing activities in the sub-fields of HIV/AIDS so as to compare research activity in different sub-fields. In addition, both Bradford's and Lotka's laws are tested for validity and applicability. The study's implications for policy makers, students and teachers of informetrics, collection development and management librarians and research funding agencies as well as suggestions and recommendations on areas for further research are provided.

A Longitudinal Study of Academic Webs: Identifying and Explaining change

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This research intends to conduct a longitudinal investigation and analysis of academic webs, with a view to identifying and explaining the changes found using informetric methods. In particular, it aims to identify and track changes in three academic webs over time (United Kingdom, Australia and New Zealand) using mathematical modelling, page classification and visual techniques; tracking as many aspects of academic webs as possible, but including site size, URL characteristics, overall linking characteristics, web topology, inter- and intra-disciplinary linking. It also intends to provide a theoretical explanation of the changes found, and if possible, to develop a non-mathematical theoretical model of academic web use.

The lack of longitudinal studies of academic webs is believed to form a critical gap in current webometric research. This is because changes in the web may mean that research investigating the web may become rapidly out of date. As a result it is essential to understand as much as possible about web growth in order to be able to assess the shelf life of academic web research.

Patterns of Multi- and Interdisciplinary Research in Bionanotechnology

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During the last years there has been a policy shift towards the promotion of interdisciplinary collaborations under the assumptions that interdisciplinary research generates a higher rate of scientific breakthroughs and it is more successful at promoting innovation. However, it is difficult in practice to distinguish between the various modes (mono-, multi-, inter-) of disciplinary collaboration and to evaluate their respective benefits in relation to the risks and costs incurred.

In this project, we aim to characterise empirically different patterns of cross-disciplinary research in bionanotechnology, a new field allegedly emerging through disciplinary convergence. We will focus on two questions: (i) To what extent is the development of bionanotechnology really coupled with interdisciplinarity? (ii) Are the actors engaged in interdisciplinary practices performing significantly better?

In a first phase, we aim to develop a set of criteria to classify and evaluate the outputs of a given research into a specific cross-disciplinary mode (mono-, multi-, inter-) from bibliometric and technometric analyses of its collaboration, citation and co-classification networks. In a second phase, we will proceed with case studies based on interviews in order to obtain a detailed picture of the different organisational forms and scientific outputs.

Webometric Analysis of International Relations within Science

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A field in which webometric tools are still used comparably little is the analysis of international relations in science. On the one hand, this is surprising as the basis of any link analysis – the World wide web – is transnational by its nature. During the last fifteen years, it has made cross-border contact within science considerably easier. Its link structure visualises the traditional, and presumably recently intensified, international connectivity of the scientific community. Thereby, it offers a lot of interesting possibilities for empirical studies. On the other hand, analysing international connectivity via the web is connected to specific methodological problems.

The aim of this dissertation project is to evaluate the specific potential of webometric methodology for the empirical analysis of international relations within science as well as its constraints. In order to reach this aim, a set of webometric indicators of international relations will be compiled and applied on the internet presences of a few selected research institutions. Through a qualitative in-depth analysis of these cases, it will be tested how clear and valid the picture is that these indicators of internationality draw.

Users' Perception with Work Task Oriented Thesaurus Design

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The purpose of the search project is to develop the methodology of thesaurus design. The aim is to investigate how to obtain knowledge about the information environment and translate it to thesaurus design. Evaluated different views on thesaurus design, this project follows up on findings about work task oriented thesaurus design and seeks to gain further knowledge about what variables to analyze and how to translate the gained knowledge to thesaurus design. The project evaluate if work task oriented organization of term relationships is a mean to improve organization and communication content. The research intends to provide more conceptual understanding to the user by giving more contextual information and in this regard will benefit from bibliometric techniques. It focuses on investigating how to present conceptual content in a meaningful way to the users. Previous research on thesaurus display evaluated thesaurus displays from an interface design perspective, and did not relate the discussion to the characteristics of the information environment. The research questions are explored by a cases study carried out in the Department of Plant Pathology at the Royal Veterinary and Agricultural University in Denmark. Finally, thesaurus prototypes will be developed and evaluated by user test and focus group interviews. The AGROVOC Thesaurus forms basis for development of thesaurus prototype.

Web Manifestations of University-Industry-Government Relations in the United Kingdom: A Link Analysis.

David Stuart

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Research is not carried out by one single type of institution; rather Universities, Industry and Government work in collaboration with one another. As collaboration is an important part of the innovation process, it is important to be able to determine how successful an organisation is in collaborating with other organisations.

This research investigates whether webometrics can provide a relatively simple and affordable way of determining an organisation's level of collaboration; whether the quantifiable number of hyperlinks between different sites could provide a weak benchmarking indicator as to the extent of the collaborations. This is based on the premise that collaborations have been facilitated by the heavy use of the Internet in the work place. This will be investigated through a classification of a selection of web links between the different types of organisation, to determine the reasons that different organisations link to one another.

Science in Brazil: A Scientometric and Linguistic Approach

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Brazilian science has gained visibility in the last 25 years. This increase is seen in Brazil's percentage share of all publications in ISI-indexed journals, which has increased from 0.4 to 1.3 % in this period. Among the variables shown to correlate with Brazilian scientific output are international collaborations, number of active scientists and research funding. These variables reflect Science&Technology trends and are good indicators of government policies towards science. However, one cannot overlook the fact that a paper published in an ISI-indexed journal is expected to be a readable text in English as well as to show sound research. Readability may be a minor hurdle for English-speaking authors, whereas for their non-English-speaking counterparts it may play an important role in getting published. Our aim is to investigate the relationship between the English proficiency of Brazilian authors and time leading to publication. Our research involves editors of ISI-indexed journals, Brazilian scientists, and doctoral students at the Federal University of Rio de Janeiro (UFRJ). We will focus on scientific productivity in the fields of physics, agricultural sciences, microbiology, biology, and biochemistry, some of the most representative fields of the country's science. The outcome of this work may help policy-makers to develop more "scientists-friendly" language policies to help Brazilian scientists in the process of getting published.

Where LIS is at and where it is going?

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This study is part of a PhD project aiming at analyzing the intellectual and social development of Library and Information Science (LIS) as an academic discipline. Several bibliometric analyses have been made on LIS, but few analyzing how the research front has developed over time. This study aims at identifying dominating topics in LIS to see how they have changed over time; and also to see if these changes can be used to estimate where the discipline is going. All 26 general LIS journals in the JCR Social Sciences Edition 2003 were selected, and from those, all research articles published 1990-2004 was downloaded through Web of Science. The analyses were done on a document level; and to discover changes in different areas over time, the analyses were time sliced into three periods. Two main types of analyses were performed. One ranking the most cited documents with a five year citation window, performing a co-citation analysis followed by a cluster analysis, to determine the main research topics during each period. The second analysis is a citation among documents analysis, starting of at the most cited documents with a five year citation window in both directions, followed by the same cluster analysis.