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# Introduction to the Special Issue on Teaching and Learning in Information Retrieval

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## Abstract

We present an overview of the special issue in this paper. The main objective is to provide information for lecturers on how to improve the student experience, using current knowledge in the field. To this end we present an overview of six papers covering areas as diverse as tools and methods used to support teaching and learning, pedagogical challenges in teaching mathematics for search etc.

*Keywords* teaching, learning, educational assessment, information retrieval, curricula

## 1 Introduction

Information Retrieval (IR) is a research area that has generated a great deal of interest over recent years, largely due to the growth in Internet use and the need to deploy web search engines in order to find information. The many problems which have been identified since the inception of the discipline in the early 1950's (Mooers, 1951) have been solved or are being tackled by thousands of researchers around the world. New advances in the field are spread following the usual scientific channels: by publication and/or presentations in seminars, journals, conferences, forums, workshops and books. Disseminating information in this way keeps researchers abreast of new developments in the field.

The knowledge gained is having a significant impact due to the widespread use of IR tools for finding information for both personal and business use either explicitly or implicitly, Therefore, it is very important that all types of students including undergraduate and postgraduate students as well as primary and secondary schoolchildren have a basic knowledge of the discipline, not just to conduct research, but also as a way of learning how search engines work and to resolve their own information needs. In terms of the field of computing, IR is a useful subject which can be used to reinforce the knowledge acquired in other subjects, such as programming, algorithms and data structures, user interface design etc. In particular, postgraduate students who carry out research in the area require knowledge of the fundamental aspects of the subject, as they may be building new solutions on top of them. So while it is important to disseminate advances gained by research in this field it is also important for the subjects vitality to understand pedagogic approaches, i.e. teaching and learning in IR. The better we inform our students, the better chance they have of undertaking quality research and they can become more effective searchers.

This special issue together with the two editions of the International Workshop on Teaching and Learning of Information Retrieval published in (MacFarlane et al, 2007) and (MacFarlane et al, 2008), informs the readership with examples of what colleagues are doing to improve the teaching and learning of IR, and to be a forum to discuss the present and future of this field. Interested lecturers may use these examples to improve their courses and to innovate with new ideas. The overall objective is to improve the student learning experiences, so they can get a better understanding of IR, independently of the educational level (primary, secondary or tertiary) .

## **2 Papers in this special issue**

This special issue is composed of six papers covering a wide range of topics related to teaching and learning of IR. The material presented is very useful in our view for IR lecturers as they reflect current tendencies in the IR teaching and learning field.

In the first of them, entitled *The Bologna Reform At The Department Of Library And Information Science And Book Studies, University Of Ljubljana* by Polona Vilar and Maja Žumer, it is shown how the Bologna reform, a process in

which most of the universities in the EU are involved in order to create a common space for higher education, has changed the study programme of the Department of Library and Information Science and Book Studies at University of Ljubljana. The paper compares the new studies with the old ones and shows how the new features introduced in the studies, like e-learning, are used to support the educational process.

The second paper, written by Andreas Henrich and Stefanie Sieber, *Blended Learning and Pure e-Learning Concepts for Information Retrieval: Experiences and Future Directions*, discusses the prospects and risks of blended learning and e-learning in IR courses. The authors describe the main elements used in these types of teaching/learning approaches and present their conclusions after six years of teaching IR.

The next article of this special issue is *An Inquiry-Based Learning Approach to Teaching Information Retrieval* by Gareth J. F. Jones. This author defends the inquiry-based learning approach to teach IR, by which the lecturer introduces a subject and the students are encouraged to work on it by solving open problems. The students develop skills in problem solving in this method. The paper gives an example of undergraduate module where this pedagogic approach is put into practice.

Andrew MacFarlane presents a paper entitled *Teaching mathematics for search using a Tutorial style of delivery*. This paper is focussed on how to teach the required mathematical background needed to get a good understanding of the core IR concepts to postgraduate information science students. The paper analyzes the main pedagogic challenges found by experience or in literature in order to improve the teaching/learning of mathematical concepts for IR. The paper puts forward a method using a tutorial style of delivery, providing evidence for an improved student experience.

How to support teaching and learning of advanced IR concepts by means of a computer-based tool is presented in *A Computer-Supported Learning System to Help Teachers to Teach Fuzzy Information Retrieval Systems* by E. Herrera-Viedma, A.G. López-Herrera, S. Alonso, J.M. Moreno, F.J. Cabrerizo and C. Porcel. These authors focus their paper on how to teach principles and concepts of Fuzzy Information Retrieval Systems based on weighted queries. This teaching/learning process is particularly difficult as the student must acquire complex concepts, supporting the

lecturer in the task of teaching by using a tool. Empirical evidence is produced to support the view that students also find the tool useful for learning about the formulation of weighted queries.

Finally, to conclude this special issue, the paper entitled *Teaching and Learning in Information Retrieval*, by Juan M. Fernández-Luna, Juan F. Huete, Andrew MacFarlane and Efthimis Efthimiadis, surveys the specialized literature focussing on pedagogical methods for teaching and learning IR and designs a taxonomy organized around two levels of abstraction: a) the technical level of delivering IR concepts and educational goals in computer science and library and information science; b) pedagogical issues as teaching and learning methods, delivery modes (classroom, online or e-learning), use of IR systems for teaching, assessment and feedback, and curricula design. The survey, and its bibliography, provides an overview of the pedagogical research carried out in the field of IR to date. It also provides a guide for educators on approaches that can be used to improve the student learning experience.

### **3 Concluding remarks**

This special issue demonstrates that IR is not only a vibrant research area, but is also a field with a very high connection to teaching. Example of how lecturers think about how to better deliver this subject to students of any type are presented, largely in the LIS or CS areas, and how the range of pedagogic tools is very wide. In our view this material is a useful contribution to the development of the subject as a whole.

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