

Information Retrieval for Children in Educational Contexts: Can We Keep Up?

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In this position paper I share some experiences of researching in the area of Information Retrieval for Kids with a focus on my research in educational settings. I discuss some findings from my own work, highlight what I believe are some of the key under explored and unresolved issues in this field of research and point to some emerging challenges for children's information seeking that the Kids and IR community might address in the coming years

CCS Concepts: • **Human-centered computing** → **Human computer interaction (HCI)**; **Empirical studies in HCI**;

Additional Key Words and Phrases: Information Retrieval, Information-seeking Behaviour, Children, Education

1 INVESTIGATING CHILD INFORMATION SEEKING IN EDUCATIONAL CONTEXTS

I have been a researcher with an interest in Information Retrieval for Kids and Child-Computer Interaction since 2002. The majority of my work on child information seeking has taken place in educational settings in the countries of the UK. My earliest experiences in this field were investigating collaborative tangible search technology for children on the WEBKIT project¹ with children in the early years of secondary school in England. A key finding of the project, and one that greatly influenced my subsequent research and thinking in this area and my wider research in Child-Computer Interaction, was the importance of the role of the teacher in the classroom-based information seeking and in interactions with classroom technology in general e.g. [8], an aspect often not fully considered in earlier studies of child information seeking in education. Several subsequent studies in child information seeking by, for example [6] have explored this important role in more detail, as indeed did my own thesis work e.g. [7][9], and it is notable and commendable that a forthcoming workshop in this area [6] has the teacher perspective as its focus, recognizing the continued importance of the role played by educators in such information interactions.

My doctoral thesis work (see e.g. [7][9]) described an ethnographic primary school-based study that investigated the information-seeking behaviour of children in Scotland with a focus on two age groups: 8-9 year olds and 11-12 year olds, investigating also the influence and perspectives of their teachers. In this work, inspired by my previous research experience on the WEBKIT project (2004) and on [4] wherein the influence of classroom environment, other actors such as peers and teachers, and resource availability emerged strongly as key factors in child classroom-based information seeking, I moved away from using more experimental approaches to investigating child information seeking, to developing my own more naturalistic approach to conducting such studies.

The approach used in e.g [7] centres the investigation on pre-existing information tasks i.e. those already developed by a teacher in reference to a national or local curriculum, rather than tasks developed by the researcher or the research team. One of the main instruments of data collection in this approach is non-participatory observation and, while traditional research instruments such as interviews and surveys can be employed successfully within the approach, central to the data collection are the extant resources in the classroom such as the post-task feedback and evaluation forms used by teachers i.e. tools that are already familiar to the children. With a view to overcoming the challenges

¹WEBKIT: Intuitive Physical Interfaces to the WWW. EU grant IST-2001-34171. 2002-2004 <https://cordis.europa.eu/project/id/IST-2001-34171>

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of interviewing children, information artefacts such as posters, exercise books, and completed worksheets created by children during the course of their information seeking are analysed and used to support discussion in focus groups. Key also to the approach is gathering the perspective of teachers via interviews and also from the feedback that they provide to pupils.

2 RESEARCH IMPLICATIONS AND ENDURING CHALLENGES

My research experiences and readings in the area of Information Retrieval for Children have pointed to significant challenges for Information Retrieval researchers, that require careful consideration and action if we are to address the evolving search needs of children in a satisfactory way. I explore this in what follows by posing a few questions to the community.

2.1 Are current understandings of child information seeking behaviour too reliant on data from studies in controlled research environments? Might more ethnographic-style research be desirable?

The literature on children's search in educational contexts remains limited in its representation of more naturalistic studies of child information retrieval. The greater part of it describes studies based on tasks created and imposed by researchers, often in lab or workshop situations that do not bear much resemblance to the contexts in which children are often carrying out their search tasks. A bigger, richer picture of kids and information retrieval has thus evaded or been actively avoided by information retrieval researchers in the past few decades. There is a continuing need for a better understanding of the role of other actors; teachers, parents, siblings, peers and others in the information retrieval processes of children. The Covid-19 pandemic poses serious challenges to undertaking this type of research of course, but I remain hopeful that further more holistic studies of child information seeking will emerge in the near future.

2.2 Has the information retrieval research community been thinking about childhood and child development in the right ways?

Are children just mini-adults who just aren't quite as skilled as grown-ups or should we instead be more imaginative e.g. [3] and consider broadening definitions and understandings of key information retrieval concepts such as at query formulation or relevance judgments, to incorporate the nuance of child information behaviour? The findings of [7] revealed significant differences in how children make relevance judgments when compared with adults, not just in terms of an additional challenge in doing so but rather that children have radically differing notions of success in information seeking than those we associate with adults. Dimensions such as the aesthetic qualities of information, the sense of autonomy, even the thrill of collaboration are of key importance to children when making relevance judgments [5]. Have such notions truly been addressed or acknowledged by the information retrieval systems designed for children or by much of the research in the area?

2.3 Text-based interactions aren't going away any time soon: how do we support children to undertake them?

Despite societal assumptions about technological ability, experience, skill and preference, many children continue to struggle with the basics of text-based interactions with information retrieval systems. Difficulties associated with spelling, typing and reading continue to pose barriers to effective search for a majority of under 12s and attempts to address this with careful IR system design have not yet succeeded in overcoming these issues. While we are now some years since the advent of voice-activated search, and smart speakers and digital assistants continue to proliferate in the

home and elsewhere, realistically, it is likely that children, much as adults, will continue to perform or be required to perform a large part of their searching activity via text-based queries and interfaces that enable these. In the traditional education setting, we are far from the point, and may indeed never reach it, where classrooms are equipped with sufficient voice activated devices for every child. The logistical and environmental implications of a class of 20-30 individuals using such devices concurrently mean that such a scenario is unlikely.

3 EMERGING CHALLENGES

During the lockdown periods of 2020 and 2021 necessitated by the global COVID-19 pandemic, education and access to information changed overnight in much of the world [10] with children being greatly affected by the physical closure of schools and kindergartens [2]. As vast numbers of schoolchildren, teachers and caregivers, made a rapid and unexpected transition to online homeschooling, the information practices, needs and contexts of children inevitably, and, perhaps irrevocably, changed in nature and these have continued to evolve as the pandemic proceeds. Evidence has emerged of children, much as adults, using a greater variety of devices and channels to access and share information, for both educational and social purposes [2]. Many children have been reliant on sharing the devices of others in their households to engage with educational opportunities, in some cases perhaps using these for the first time, or if not for the first time, are using them in new ways, while others have acquired devices via loans from schools or local authorities [11]. There is evidence [11] that the move to education delivered partly or wholly online, has entrenched existing economic and social inequalities, and access to information has been one of the casualties.

The key role played by teachers in child information seeking in educational contexts was discussed earlier in this paper. The new paradigm of online homeschool is generally absent of the immediate, watchful support of a teacher or peers, and without the full supervision of a parent or guardian (whose attention may well be diverted due to their own work from home situation), leaving the child information seeker without much of the key support needed to fulfil their evolving and information needs. An additional emerging challenge for children and caregivers pertains to the increased burden of re-finding of information in the plethora of information channels utilised to support homeschooling. Children engaging in homeschooling are likely to be engaging with multiple platforms e.g. Teams, Zoom, Googlemeets with information being shared via each [1]. Keeping track of, organising and, crucially, re-finding this information when needed, is adding additional complexity to the educational information retrieval and information behaviour context, that requires a response from, and could indeed re-focus the efforts of our community. I hope that we will rise to the challenge.

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