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# Some Things Never Change: Overcoming Persistent Challenges in Children IR

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## Abstract

There is a lack of a steady and solid influx of information retrieval (IR) research that has **children** (as the user group) as the protagonist. Existing work is scattered, conducted by only a few research groups, and often based on small-scale user studies or data that cannot be widely shared. Moreover, much of the current research focuses on specific age ranges and abilities, neglecting the broader spectrum of children's needs. Consequently, the paucity of IR research on how search and recommender systems serve and/or ultimately affect children translates into one of many '*Low-resource environments*' in IR. Drawing from the literature and our experience in this area, we highlight key challenges and encourage greater attention from the IR community to address this critical gap.

## CCS Concepts

- Social and professional topics → Children; • Information systems → Information retrieval.

## Keywords

Children, Data, Challenges, Information Retrieval, Community, Search, Recommender Systems

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## 1 Some things need to change?

Despite the growing role of search engines and recommender systems in shaping the information seeking behaviour of youngsters—and the type of information they ultimately encounter—Information Retrieval (IR) research specifically dedicated to identifying and addressing the needs and expectations of this user group remains

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scarce [6, 26, 30]. Children IR emerged almost 30 years ago with Yahooligans! [1], the earliest commercial systems for children launched in 1996. PuppyIR [2], a major European project focused on helping children use the Internet safely that ran from 2009–2012, led to significant publications. However, with data locked behind proprietary walls, studies over the last 30 years have been fragmented, and the broader IR community often overlooks children as a user group. Efforts to rally researchers around this area have faced obstacles, and contributions on Children IR struggle to gain recognition [16, 28, 33].

IR is stuck in a cycle where the lack of datasets and benchmarks stifles progress, making it difficult to attract fresh perspectives. More so, children are not a monolithic group; their language, comprehension, and interaction behaviours with IR systems evolve. Standard IR metrics fail to capture perspectives that matter, e.g., content fit, potential harm, and understandability [17, 39, 40]. Even 'relevance' cannot be taken at face value for this audience [25]. Artificial Intelligence (AI) and Large Language Models (LLMs) offer promise but also risk reinforcing biases [3, 31, 37, 38]. Yet, the challenge is worth tackling: young users deserve improved access to information so that they can grow into better-informed and skilled adults. Additionally, as a research community, we should come together to use the insights gained from research with children as protagonists, not just to better support them but also to transform and tailor IR for many other underserved communities ('low-resource environments'). The question is *not whether we should just accept some things never change—it is how can we afford not to change them.*

## 2 Why does building community to advance Children IR remains a struggle?

Advancing Children IR research remains a struggle as this effort cannot be limited solely to a handful of IR researchers [e.g. 4, 5, 8, 12, 13, 20, 21, 24, 39, 41, 42]. It demands participation from the broader IR community willing to engage in the discussions and bring their expertise on core concepts—relevance, evaluation, rankings, query performance prediction, multilingual IR, to name a few—to advance understanding and outline the gaps inherent to this user group. It also requires a multidisciplinary approach, so that experts in language (as children's vocabulary differs from adults', and terminology changes inevitably over time), education,

and child development can inform the discussion to produce meaningful advancement. Initial attempts made to build community at conferences like ACM RecSys, ECIR, and ACM SIGIR resulted in workshops such as KidRec<sup>1</sup> and IR4U2<sup>2</sup>, which were attended by relatively few researchers and practitioners already involved in work focused on children and other understudied populations that share challenges [16, 22, 33]. While these workshops provided a platform for positive interactions and facilitated ongoing discussions, they did not succeed in reaching a broader audience within the IR community.

At first glance, insights from studies on the use of popular web tools or new proposed algorithms based on simple/established IR solutions are viewed as ‘not novel enough (known insights just for another user)’ or ‘show no technical innovation (perhaps they are simply replicating work with another sample)’. However, this perspective overlooks that novelty lies at times in confirming applicability for a very distinct type of user [9], identifying unknown gaps and research needs, or addressing a particular problem focused on children that may also benefit a broader range of users. While such works do exist, perhaps due to their multidisciplinary nature, they often appear in other venues; one could argue that this is a loss for the IR community’s body of knowledge.

### 3 So what do we need to do?

Several key issues have emerged from the limited research efforts undertaken over the last three decades. Below, we highlight those that, informed by prior experience, we consider fundamental.

The *lack of dataset and benchmarks* hinders engagement, reflection, and proposed solutions coming from the wider IR community. One of the main reasons behind this is surely legislation designed to protect this vulnerable audience, which inadvertently restricts the collection and curation of such datasets. Although some data samples exist, such as query samples produced by children and relevance assessments from a child’s perspective [e.g., 17, 29, 36] a joint effort between the research community and governmental institutions could help ensure access to representative user data, enabling the development of better IR technology for children [14, 27].

*Traditional assessments are insufficient*, as most metrics focus on the standard sense of relevance and ground truth. However, for children, relevance extends beyond simply meeting an information need—it also involves factors such as harm, information disorder, appropriateness, comprehension, emotional sensitivity, and trust. Additionally, *children are not a homogeneous user group*; they differ in development, skills, preferences, behaviours, but also habits and modalities in which they seek for or are exposed to information, and then contexts in which that takes place [10, 11, 18, 19, 25, 34, 40].

Children’s preferred *modalities and platforms* for seeking and consuming information are evolving—traditional text-based queries on popular search engines that lead to SERPs are no longer the standard approach. Instead, children increasingly favour conversational (voice-driven) interactions, the use of agentic search systems, and relying on Social Networks to become informed. This shift expands the range of research challenges and opportunities for the IR community must address to produce algorithms and interfaces that can

<sup>1</sup><https://kidrec.github.io/2017/>

<sup>2</sup><https://ir4u2workshop.wixsite.com/ir4u2>

effectively assist children in making good use of powerful and pervasive tools for information discovery [7, 15, 43]. The key is being proactive, not reactive; we should prioritise children and design technology with their needs in mind from the outset, rather than adapting mainstream IR technology to them as an afterthought.

*AI and LLMs* have the potential to help lower barriers to modelling and personalisation for this user group. With a noticeable increase in IR technology that leverage AI and LLMs, it has become imperative to better understand children’s specific needs, both in terms of literacy skills [23] and how to support their searching and engaging with (potential) information inside and outside the classroom. However, we must also recognise the risks associated with these technologies, particularly when applied to research involving children. A major challenge is preventing the reinforcement of biases and stereotypes inherent in LLMs and AI technologies, as the training data—at least to our knowledge—does not adequately or comprehensively represent this audience [31, 32].

### 4 If it is challenging, why should we do it?

As a community, collectively, we *have the skills*, so why not use them to serve broader audiences? With their idiosyncrasies, children are not only future ‘mainstream’ users of IR systems but are also actively shaping their understanding of the world based on the information they encounter. Search options and recommender systems in the platforms children commonly engage with influence their opinions, critical thinking, and digital literacy, ultimately impacting how they grow into skilled adults able to make the best use of available IR tools. We have a *responsibility* to allocate research efforts toward understanding how children interact with, are affected by, and can be better served by IR technology.

Moreover, what we learn as a result of working with children can and will *influence and inform research on other understudied user groups*: if we think about it, factors such as cultural, linguistic, and economic barriers, as well as digital/information literacy and many other facets that are related to Children IR naturally overlap with challenges in other low-resource environments. Addressing these issues can benefit the community as a whole, moving beyond the stigma of ‘low resource’ or ‘understudied’ labels [27]. It will not be not easy, and it will require building on the existing core of experienced researchers working on this area as well as including a new wave of *diverse* (approach, focus, expertise, etc.) researchers and practitioners for whom the ‘understudied or underserved’ label will no longer result in research relegated to a side issue of fairness or bias, but to the central goal of providing information access (broadly defined) to all [26, 27, 35].

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