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# Evaluating Technologies with and for Disabled Children

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**ABSTRACT**

Due to policies supporting the inclusion of disabled children in mainstream schools and the use of technologies to enable personalized schooling, there are broad research incentives and opportunities to design technologies for disabled children in educational contexts. A workshop at CHI 2018 with researchers and practitioners working on accessible and assistive technologies for children in educational settings [7] raised two on-going challenges in this area: (1) Very few assistive technologies proposed in research are evaluated in context, notably because of the many practical constraints on evaluation when working with these small communities of diverse individuals; (2) The scholars turning

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their attention to context raise new design preoccupations, such as interdependence, for which we do not yet have a community consensus regarding the suitable approaches to evaluation. Although this workshop was conducted with researchers working with children with visual impairments, these challenges apply more widely to the field of technologies for children with disabilities in educational settings. The purpose of this SIG is to bring together researchers and practitioners to encourage the homogenization of evaluation approaches for accessible and assistive technologies in schools.

### CCS CONCEPTS

• **Social and professional topics** → **People with disabilities**; • **Applied computing** → **Collaborative learning**.

### KEYWORDS

Accessibility; Inclusion; Education; School systems; Disability.

### ACM Reference Format:

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### INTRODUCTION AND MOTIVATIONS

Two current educational policies intersect to create research incentives and opportunities to design technologies for disabled children in educational contexts: the inclusion of disabled children<sup>1</sup> in mainstream schools, which the international Convention on the Rights of Persons with Disabilities have made the norm; and broad calls to use technologies to support personalized schooling [2]. However, very few of the proposed technologies have been evaluated in the field, let alone over long periods of time, which greatly limits the impact of this research [3]. This was also one of the primary concerns of a group of scholars (including several of the authors of this proposal) working on technologies for and with visually impaired children<sup>2</sup> who met during a workshop at CHI 2018 [7].

Approaches and concerns about evaluation are multiple, and sometimes in tension to each other, as this field of research gradually considers the impact of disability studies on design and practices [5]. This is opening new perspectives for design, rooted for instance in interdependence [1], moving beyond models isolating children with disabilities and their assistive technologies from their social and institutional context. It also broadens what may count as educational, exploring the social and experiential [6, 8] aspects of interacting with technologies. However, there are no consensuses within the community on how to evaluate impact of technologies on relationships in a holistic way, either

<sup>1</sup>There are debates on the use of person-first (*children with disabilities*) or identity-first (*disabled children*) language. There are diverging preferences on this topic across geographical areas and communities. We use both alternatively, although we mark a preference for disabled children because it matches our understanding of disability as an element that can be source of positive identification.

<sup>2</sup>Some of the issues pertaining to evaluation were discussed in an Interactions column as well as online.  
See: <http://www.inclusiveeducation.tech/outcomes/>

when evaluating them at the individual level or in context. In addition, many practical obstacles arise when planning and conducting evaluations with non-homogeneous groups of children.

To complicate matters, the community is often scattered across different specialised conferences (PDC, ASSETS, IDC) which can make it difficult to meet and act on these issues in a joint effort, or sustain interest and collaborations between researchers with different backgrounds. A SIG at CHI would thus consolidate the topic of holistic evaluation of technologies for and with children with disabilities. We are particularly keen to invite the broader community working on education and technologies for children, as this would contribute to raise awareness about inclusion and accessibility — and the particularities of working with disabled children. Furthermore, this is a timely topic given the addition this year of the Learning, Education and Families subcommittee at CHI and recent calls for strengthening the insights gained from designing technologies with and for children<sup>3</sup>.

<sup>3</sup><http://interactions.acm.org/blog/view/making-the-child-computer-interaction-field-grow-up>

#### **RELATED WORK: EVALUATING TECHNOLOGIES FOR AND WITH DISABLED CHILDREN**

Given the diversity within groups of disabled children and the fact standardized assessments are often inappropriate with them, current research is exploring suitable evidence-based study design of technologies on learning, advocating for instance for single subject research studies instead of group-based approaches [2]. These, however, do not take into account the relational aspect of learning, even though children do not only learn in isolation. This may even reinforce an educational paradigm in which disabled children attend mainstream classrooms but are mostly kept separate from their peers, in a “*bubble*”; [6], while interest for improving peer collaboration grows in educational research. To understand technologies’ impacts in mixed-ability groups that are mainstream classrooms, scholars might instead turn towards explaining meaning-making processes in learning using multimodal analysis [4]. But for researchers working within an interdependence framework, there is a need to expand evaluation beyond the time in which children are interacting with a prototype. Frameworks for participatory evaluation [8] might be better suited, and are a practical way to look at interactions through time, for instance by scheduling short interviews well after initial use. It furthermore enables considerations of technologies’ impacts on values and preferences.

Although all of these approaches co-exist in the field, two main issues remain: they have not yet been mapped and there are no homogenization of practices, which makes it difficult to select and defend appropriate approaches. Moreover, we still lack insights into how we different approaches to evaluation complement each other.

#### **CHALLENGES THAT WILL BE ADDRESSED IN THE SIG**

- Developing documents with the community, to provide practical and methodological advice about how to evaluate technologies in this context. During the workshop at CHI’18, several

issues were raised: inaccessibility of many standard academic skills tests; the complexity of in-the-wild studies that involve triangulating multiple stakeholders' perspectives; planning and scheduling evaluation; and the need to better acknowledge heterogeneity in schooling experiences. The SIG will be an opportunity to continue mapping these issues, collect and discuss stories about how other researchers addressed them, and invite new collaborators in this endeavor.

- Commenting and refining a manifesto about evaluation approaches: we will invite the broader community in commenting on the manifesto developed during the previous workshop about evaluation approaches, their validation criteria and the types of claims they support.

These documents will be shared and editable online and will serve to strengthen the community by providing actionable guidelines for the evaluation of technologies in complex scenarios such as those surrounding disabled children in mainstream schooling.

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## **SUPPLEMENTARY MATERIAL**

### **Communities of Interest**

This SIG may interest several, only sometimes overlapping, communities: scholars and practitioners working on technologies for children and families; scholars and practitioners working on educational technologies, including social researchers working on studying the contexts in which these technologies are used; and scholars and practitioners working on assistive technologies. We are particularly keen to invite the broader community working on education and technologies for children, as this would contribute to raise awareness about inclusion and accessibility — and the specifics of working with children with disabilities.

### **Assumed Attendee Background**

First, we aim at the participation of graduate and PhD students, as previous experiences of the authors as chairs of doctoral consortium suggest that evaluation is an especially difficult question. Then we aim at a healthy mix of practitioners and researchers new to the domain of disability and technologies, and confirmed researchers sharing their experience.

### **Organization and Planning**

We propose the following 80-minute agenda:

**Introduction (10 min).** We will begin with an overview of materials previously developed, rapid 1-minute introductions of the co-organizers, and the schedule.

**Constitution of groups (10 min).** We will constitute groups of scholars and practitioners of diverse level of experience, who will be invited to join four different tables and topics of discussions.

**Small group discussions (40 min).** We will organize discussions around four tables each with a facilitator: one for the manifesto, one for discussing and proposing practical advice and develop guidance document, one for raising new issues that may not have been uncovered during the workshop, and one networking.

**Wrap-up (20min).** Each facilitator will provide an overview of the discussions, and invite comments and propositions to further research in this area.

### **Recruitment Strategy**

We will share the call through relevant mailing lists and within our own communities through personal and online social networks, as well as more broadly in the community working on technologies for children and on education.

**Primary Contact**

Emeline Brulé will act as the primary contact for the submission process. In addition, we plan to have a shared email address for inquiries beforehand and after.

**Going Further**

As discussed in the proposal, this SIG would build on the foundations established at CHI 2018 and is designed to further a community effort around evaluation, by the collaborative development of online resources for research. We plan to continue organizing such events in ACM conferences, e.g. ACM IDC, and beyond, given for instance the interest of the American Sociological Association for the uses of technologies by disabled children. We are hoping it will also foster new collaborations and publications around this topic.