Ethical Concerns when Working with Mixed-Ability Groups of Children

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ABSTRACT

Accessibility research has gained traction, yet ethical gaps persist in the inclusion of individuals with disabilities, especially children. Inclusive research practices are essential to ensure that research and design solutions cater to the needs of all individuals, regardless of their abilities. Working with children with disabilities in Human-Computer Interaction and Human-Robot Interaction presents a unique set of ethical dilemmas. These young participants often require additional care, support, and accommodations, which can fall off researchers' resources or expertise. The lack of clear guidance on navigating these challenges further aggravates the problem. To provide a basis on which to address this issue, we adopt a critical reflective approach, evaluating our impact by analyzing two case studies involving children with disabilities in HCI/HRI research. Flowing from these, we call for a shift in our approach to ethics in participatory research contexts to one that is processual, situational, and community-led.

CCS CONCEPTS

• **Social and professional topics** → **Children**; **People with disabilities**; • **Human-centered computing** → **HCI theory, concepts and models**.

KEYWORDS

Accessibility, Mixed-Ability, Children, Ethics

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1 INTRODUCTION AND BACKGROUND

Inspired by and extending Spiel et al.'s work on the micro-ethics of conducting participatory design with marginalized children [43], we present our considerations of the ethics of working with mixed-ability and neurodiverse groups of children.

We situate our research within the fields of ethics and inclusive educational technologies, with an expressed concern for empowering marginalized communities (some of which we belong to) to co-create and take an active role in shaping agendas. We engage with these topics with the ultimate goal of moving away from transactional service models and toward more relational ways of thinking and being in the world in order to challenge hegemonic power structures [22, 42].

In that context, we consider it particularly important to actively include marginalized populations in our work, and, within that, we also highlight the importance of including children as protagonists in participatory research [26].

With the growth of accessibility research within and as a subfield of HCI, recent works move towards a more social and relational model where disability is not located within an individual or infrastructure [5, 24]. Instead, it is enacted through social-material arrangements and practices (i.e., produced through interactions) [27].

Specifically, in the case of inclusive educational technologies, research has grown beyond the adaption of materials for individual use by children with disabilities towards the creation of shared solutions that promote group work between children with and without disabilities, allowing them to play and learn together [4, 6, 33, 34, 39, 41]. Participatory and community-led approaches tend to be favored due to their potential to provide future users with agency over the technology developed for them [24, 30, 35, 38]. Though this approach has proven highly effective in creating more equitable classroom environments [9, 30, 35, 38], it is not without its challenges.

Power dynamics are an inherent aspect of design processes, where designers often dominate decision-making without adequately considering standpoints external to themselves [22]. Indeed, as Spiel argues, the concept of empathy, often used as a way of seeing beyond one's self, is of very limited scope, as it can lead to very superficial understandings of others' experiences [42]. Moreover, design's penchant for solutionism is an inadequate frame for participatory work and may even perpetuate injustices by privileging certain perspectives, often those hegemonic in detriment of any alternatives [22, 42].

Indeed, this mindset often leads to oversimplified representations that misrepresent the complexity of marginalized identities when there is no actual understanding of a community [7]. As such, a "Nothing About Us Without Us" approach to participatory research can lead to genuine inclusion of marginalized groups in all stages of the research process, from design to decision-making [49]. This highlights the transformative potential of inclusive research practices, especially through a community-led approach, which seeks to empower participants and ensure an active and leading involvement with the research.

Children-centered research comes with its own set of ethical challenges which must be heeded, especially when working alongside marginalized children [43]. This is particularly the case in mixed-ability settings [19], where the researchers' standpoints must be observed in the interactions between diverse groups of children with differing understandings of themselves, their peers, and their environments.

This matters because ethics is contingent [22], and our deliberations as researchers are highly dependent upon social contexts and environments [3]. Indeed, this is the value of an approach like Komesaroff's micro-ethics [28]. Rather than focusing on ineffective sets of predetermined and overarching principles, micro-ethics can zoom in on the smaller scale day-to-day ethical decisions and interactions that occur organically between people.

In educational contexts such as mixed-ability classrooms, micro-ethics encourages teachers and students to engage in ethical reflections and decision-making on a more case-by-case basis. It might also prompt researchers, as well as teachers, to consider how their choices, interactions, and pedagogical strategies impact the well-being and development of each child, particularly those who belong to marginalized groups [43].

These considerations, moreover, necessarily imply some level of caregiving, which necessitates that we theorize on our ability to, as researchers, adequately provide it [45]. As such, an understanding of care ethics is relevant to any research involving human participants, especially when working with vulnerable populations [43].

Care is an integral part of all human interactions, but it often remains unacknowledged in research reports. Care is, nonetheless, more than theory, it is, fundamentally, practice. Joan Tronto identifies in her work four different yet entwined stages of caring [47], from which we draw for our considerations. They are 1) attentiveness: which refers to the inclination to be attentive and aware of the needs of others; 2) responsibility: which involves being willing to take action and respond to meet those needs, showing a sense of duty and care; 3) competence: which relates to the ability to provide effective care, demonstrating skill in addressing the identified needs; and 4) responsiveness: which encompasses considering the perspectives of others as they perceive them in reaction to the care process, and acknowledging the potential for abuse or misuse in the context of caregiving.

Keeping in line with this theoretical background, we detail two separate case studies within our research working with children in mixed-ability settings in order to provide a reflective account of that research and its ethical challenges. We do so with the intention of highlighting the importance of a shift to processual and situational ethics that is community-led [21] as opposed to the more typical, albeit often insufficient [43], prescriptive and static models, to collectively build on more viable approaches to ethical deliberations in dynamic contexts.

Toombs et al. emphasized the importance of reciprocal care relationships between researchers and participants, highlighting how care ethics can deepen our understanding of relational dynamics and improve the ethical engagement of long-term research [45]. Indeed, this perspective is particularly relevant for studies involving mixed-ability groups, where sustained interactions can significantly impact participant well-being and engagement.

2 CASE STUDIES

In this section, we will look at two case studies, each showcasing distinct educational settings and the ethical dilemmas they entail, while also highlighting their shared traits and unique aspects. Both studies involve mixed-ability groups within inclusive schools situated in the same country. All participating students are fully integrated into age-appropriate classrooms and are familiar with their peers within the activities conducted.

The first case study centers on small-group learning activities, pairing students to develop computational thinking skills within a school environment, accommodating children both with and without visual impairment [39]. These activities were conducted under the supervision of a teaching assistant assigned to support specific students included among the participants.

In contrast, the second case study unfolds in inclusive classrooms catering to neurodiverse students [38], focusing on a game-design activity. Here, the teachers responsible for the entire class were present during the activity.

The projects were spearheaded by distinct research groups, although they shared two common researchers, offering an interesting juxtaposition of approaches and outcomes.

2.1 Methods

Given the recent shift in HCI and inclusive education work towards centring social interaction and inclusion within mixed-ability groups [50], we selected case studies from our work that illustrate this diversity while remaining comparable. The two case studies, conducted at different schools, focus on different forms of disability, HCI methodologies, and length of engagement. However, they involve a similar age group in the same city and socioeconomic context. Each case study was reflected upon by its lead researcher through reflexive methods and a Feminist Ethnography lens [29]. Ethical concerns were independently identified, and a cross-case analysis was conducted to compare and contrast these concerns [29].

2.2 Mixed-Visual Ability Groups of Children Collaborating in Computational Thinking Activities

The first case study recalls the work developed in [39]. Children with disabilities are educated in an inclusive approach within mainstream schools, demanding new adaptations of support in learning and social activities [36]. Computational thinking (CT) is already established in children's educational curriculum. In inclusive education, collaborative coding environments, besides the learning and social benefits [16], also have the potential to promote inclusive behaviors between people with different abilities. Regarding the recent shift to remote and hybrid collaborative environments, this work discusses the benefits and limitations of remote and co-located collaboration in CT activities among children with mixed-visual-abilities.

2.2.1 User Study. The study used a tangible robotic system resembling the Sokoban game [2]. The collaborative CT activities were set up in two environments that varied in presence and proximity between the pair (remote and co-located) with two interdependent roles (one managed the tangible map and robot, while the other programmed the robot's behavior with coding blocks). We conducted within-subjects research to give children the opportunity to solve puzzles in both environments with both roles. A researcher and their Inclusive Education Teacher were always present for each session.

Ten mixed-visual-ability dyads between 10 and 17 years old ($M = 12.75$ $SD = 1.9$) from three inclusive schools in the same country participated in the sessions. Through their teachers, we asked the children with visual impairments to invite a sighted schoolmate to form pairs. We ensured that all participants were attending 5th-8th grade considering the national curriculum. The participants' legal guardians signed the consent forms, and the children agreed to participate.

All the sessions were video and audio recorded, and we collected data in light of our research question to measure task performance, social behaviors, and user experience.

2.2.2 Possible Concerns.

(1) **Balancing Interference While Preserving Learning Opportunities** - When working with mixed-ability groups of children, we believe it is important to promote an inclusive environment, i.e., where all children feel safe, supported, and free to participate [8]. When children share a collaborative environment and its tools, it can be challenging for researchers to properly manage the situation without interfering in the research or the children's relationship. In our study, we encountered an illustrative incident of uncooperative behavior between partners when a sighted child took over the coding blocks of his blind partner and finished that puzzle by himself. Neither the researchers nor the teacher intervened during this interaction, as our primary aim was to observe the social dynamics among the children. However, this lack of mutual respect, along with the substitution of agency of the blind child, resulted in an exclusion experience. Regrettably, this exclusion went unaddressed by all parties involved, representing a missed opportunity for a significant learning moment. It is vital to strike a balance between observing natural peer interactions and addressing situations, even after they have occurred, as demonstrated in the example mentioned above. This is indispensable for ensuring that the inclusive environment continually offers substantial enrichment for all participants and that valuable learning moments are not wasted.

(2) **Unmet Expectations** - When children are pulled away from routine activities, they build certain expectations. Our study took place during school hours, and children were told they would be playing together with robots and LEGO. It is fair to assume children built up high expectations of fun. These circumstances potentially harm the young participants by disappointing them. During our activities, there were moments of congested participation when children had to wait for their partners. The long waiting period promoted moments with no communication (particularly in remote settings) and, therefore, no awareness of the ongoing activity. For instance, in two of the groups, we noticed that some blind children appeared disengaged, with some even lowering their heads onto the table, sleeping, potentially indicating a state of disinterest. To recap, recognizing and managing children's expectations is essential when conducting activities that deviate from their usual routines. Addressing moments of waiting and non-communication is crucial to ensure a more engaging and inclusive experience for all participants, especially in remote settings.

(3) **The Inclusive Education Teacher Effect** - In these school contexts, each student with visual impairment has an assigned inclusive education teacher (IET) enabling a tailored learning approach that adapts to each child's abilities. This predetermined allocation greatly influences the IET's involvement in the activity. In one-session activities, such as the one described, it's common for participating children to be unfamiliar with the researchers. Hence, the support of teachers becomes crucial to ensuring active engagement. Researchers may lack insight into each participant's distinct traits, abilities, and knowledge, which can impede effective empathy and communication. In this scenario, the level of IET engagement in the activity is shaped by both the participants and the teachers' personal interest in the activity. During the activity, IETs typically concentrate their attention and support exclusively on their designated students, ignoring the other students (with or without visual impairment). Furthermore, IETs are more inclined to actively engage in activities that align with their own interests. The extent of IET involvement significantly influences the children's engagement levels. When an IET actively encourages participation, both children in the paired activity are more likely to be engaged. Conversely, if the IET fails to encourage children's participation it becomes challenging for researchers to sustain their engagement, especially in more idle moments.

2.3 Neurodiverse elementary school classrooms co-designing a robotic game

Our second case study describes work developed in [38] applying a methodological toolkit for neurodiverse co-design [37]. This work explored the inclusive potential of co-design methodologies and tangible robotic games within a neurodiverse classroom environment. Though integrated into mainstream schools, neurodivergent (ND) children often face social exclusion from their neurotypical (NT) peers, as the two groups of children often struggle to engage with each other due to different communication styles, preferences, and sensory needs [32, 44]. Being the minority, ND children often miss out on group play and its fundamental benefits [11–15, 25]. HCI games research has done little to address this issue, with most games taking on a medical framework and focusing on single-player solutions for a single diagnosis [44]. We aimed to encourage neurodiverse play through the co-designed game and promote classroom inclusion throughout the co-design sessions.

2.3.1 Co-Design Sessions. The co-design sessions pertaining to this project took place over the course of 6 months in a local public elementary school. We engaged with four classrooms (two 2nd grades and two 4th grades), with a total of 81 students (43 girls and 38 boys, between 6 and 12 years old $M = 8.22$ $SD = 1.26$, 19 ND: thirteen learning differences, one dyslexia, two intellectual disabilities, two ADHD, one Down's Syndrome, and one Global Developmental Delay).

Our process was broken down into five 90-minute sessions encompassing multiple methods (e.g., crafting activities, Expanded Proxy Design [31], low-fidelity prototyping). The first two sessions aimed to familiarise the children with the robotic element they were to work with, a commercial Ozobot robot [1]. The last three sessions focused on the development of game prototypes.

Prior to the co-design sessions, we held a focus group with teachers of neurodiverse classrooms and multiple interviews with neurodivergent adults to inform us of the challenges and opportunities we might encounter in the classroom. The children's legal guardians and the participating teachers signed the consent forms, and the children agreed to participate. All the sessions were video and audio recorded, and we collected data in light of our research question to analyze social behaviors and user experience.

2.3.2 Possible Concerns.

(1) **Transparency vs. Exposure** - When working with a vulnerable population such as children, especially in the case of marginalized children, we believe it is important to communicate our research goals and outcomes clearly. However, with neurodivergence being somewhat invisible, mentioning it within the classroom could bring undue attention to neurodivergent students, which could lead to further ostracization. We elected not to communicate this facet of our research to the children, simply stating, "we are going to create a game everyone in the classroom can play". We utilized techniques, like Expanded Proxy Design [31], to emphasize the needs of neurodivergent children without spotlighting their differences. This method proved effective in making NT children aware of said needs, and one girl with an intellectual disability openly and joyfully stated that the proxy was like her. Nevertheless, this impacted how the design process was conducted, not allowing full transparency with our co-designers.
(2) **Teachers' Influence** - As the authority figure within the classroom, teachers hold major sway in any interactions that happen within it. From our initial teacher focus group, we understood that they saw themselves as problem solvers. However, the interviewed ND adults warned us that a teacher's treatment of ND children, be it good or bad, will influence how the NT children treat their ND classmates. Our time in the classrooms validated these concerns and showed us the impact of different teaching styles on neurodiverse group dynamics. In one of the classrooms, a very caring teacher often acted in a coddling way towards her ND students. This was mirrored by NT classmates, who did not exclude ND students but didn't see them as equals either. In another classroom, an assertive teacher often solved group conflicts by demanding everyone perform the task in the same *neurotypical* way, barring creative freedom and undermining neurodivergent interpretations. In both cases, we recognized an issue but did not feel comfortable intervening given the existing hierarchy, which may have been a choice in detriment of the participating children. It is essential to highlight, however, that none of the teachers acted in bad faith.
(3) **Balancing Opinions** - As a direct result of us not communicating the ND aspect of our study, all group members (NT and ND) were seen as equal, which seems ideal. This, however, posed a problem when it came to group decision-making. Children often struggled to find a single solution that would fit all of their needs and preferences. When this happened, they tended to use voting as decision-making. Within this scenario, the fact that NT children were the majority put ND interests and needs at a bigger risk of being ignored. To circumvent this issue, we tried to work with the groups towards compromising on ideas that mixed multiple ideas rather than choosing a single one. Nevertheless, it is unclear how to make ND voices heard within these group contexts without bringing undue exposure. Though direct mediation proved somewhat effective in our case, the presence of a researcher during this creative activity may have also stunted the full creative potential of child-led ideation.
(4) **Classroom Expectations** As pointed out by Spiel & Gerling in their review of HCI games research with ND populations [44], classroom environments are not the most hospitable for ND self-determination. Working within them is, nevertheless, important as children spend a significant amount of time in these environments. The typical classroom rules (e.g., sitting still, being quiet) are unnecessary for co-design activities and may even be counterproductive in many cases. However, with the limited space and acoustics, some classroom management is needed to maintain a sustainable environment for all participants. On several occasions, we witnessed ND children, primarily one boy with ADHD, being scolded by both teacher and classmates for behaviors such as stimming, frequently getting up, and getting off-task. As researchers, we were aware such behaviors are to be expected and healthy,

and we wanted to encourage them. However, our perception limited the authority within the classroom and stopped us from changing this status quo in favor of a safer, more inclusive working environment.

3 DISCUSSION

This paper explores ethical considerations when working with mixed-ability groups of children in the context of HCI and HRI research. It presents two case studies conducted within educational settings to investigate the inclusive potential of collaborative activities involving children in mixed-ability settings and neurodiverse groups of children.

3.1 Recognising Common Themes Across Case Studies

The first case study involves mixed-visual-ability groups of children collaborating in CT activities using tangible robotic systems. It highlights challenges such as managing interference while preserving learning opportunities, addressing unmet expectations among participants and manage teacher influence.

The second case study focuses on neurodiverse elementary school classrooms co-designing a robotic game. It discusses concerns related to transparency versus exposure of neurodivergent students, the influence of teachers on group dynamics, balancing opinions within the co-design process, and managing classroom expectations. Both case studies emphasize the importance of promoting inclusivity, addressing power dynamics, and considering the well-being of all participants, especially those from marginalized groups.

Common threads between both case studies include the need for transparency in communication with participants, the importance of balancing power dynamics within research settings, the role of the teacher, and the recognition of diverse perspectives and experiences. We also highlight the challenges of navigating ethical dilemmas in educational contexts that include diverse groups of children and observing the role of teachers.

3.2 Limitations of Prescriptive Ethics in Mixed-Ability Classrooms

As exemplified through our case studies, both of which obtained approval from their respective institutions' Ethics Review Board, the complexity of our interactions does not fit into a static model of prescriptive ethics. The ethical complexity inherent to both these case studies, and, indeed, most participatory research [42], underscores why a prescriptive approach to ethics is inadequate. Prescriptive ethics typically relies on fixed sets of rules or principles to guide ethical conduct. These tend to be set at the beginning of a project, which limits their applicability in real-world settings [21]. People are complicated, they can be surprising and unpredictable; and children most of all.

Indeed, the dynamic and multifaceted nature of interactions within educational settings involving diverse groups of children with a wide range of needs and experiences challenges the applicability of rigid ethical frameworks. This requires a more context-sensitive approach to ethical decision-making that takes into account the specific nuances of each situation, which must include an observation of the power dynamics inherently present in any participatory research project [42].

Moreover, the intricacies of navigating ethical considerations in mixed-ability group settings highlight the limitations of prescriptive ethics in addressing the unique challenges faced by researchers. Each case study presents distinct ethical dilemmas, such as balancing interference while preserving learning opportunities, sustaining engagement, and managing classroom dynamics and each child's expectations without unduly exposing students with disabilities. Indeed, the role of the teacher is also a significant aspect to consider. In both case studies, teachers wield significant influence over the dynamics among the children. In the first study, the engagement and support provided by inclusive education teachers directly impacts participation levels, especially for children with visual impairment. Similarly, in the second study, teachers' teaching styles and conflict resolution methods shape interactions among neurodivergent and neurotypical students, affecting inclusivity and participation in classroom activities. Recognizing and addressing teachers' influence is an important aspect of fostering environments where all children feel valued and included in research endeavours.

3.3 Power Dynamics and Mitigation Strategies

In educational settings, complex power dynamics involve researchers, teachers, children, and guardians. These are heighten in mixed-ability settings, where groups may be marginalised due to ability disparities. Understanding and mitigating these imbalances is crucial for fostering an inclusive research environment. Our case studies illustrate these dynamics, as researchers balanced support without disrupting natural interactions. This aligns with [45], emphasising care ethics to address researcher-participant power differentials through listening, responsiveness, and reflexive adjustments. Strategies include fostering reciprocal care, active listening, and building trust. IETs were essential for maintaining engagement and communication, reflecting Spiel's [43] emphasis on managing teacher influence for balanced participation while valuing their judgment for the child's benefit. Mitigation strategies involve collaborative planning with teachers to design activities and integrate their insights. Peer interactions in our neurodiverse classroom sessions showed the need for sensitivity to diverse communication styles, supporting their call for design humility [42]. This approach values all contributions, promoting respect and ensuring all voices are heard. Mitigation strategies include facilitating inclusive communication and encouraging equal participation through collaborative activities. Our studies stressed inclusive practices challenging dominant power structures, aligning with [20, 22]. This approach addresses oversimplified representations that misrepresent marginalised identities and reinforce power imbalances [7, 42]. This can be mitigated through a community-led approach [49], ensuring marginalised voices share their experiences as partners.

3.4 Why Feminist Community-led Care Ethics

These complexities cannot be adequately addressed through a one-size-fits-all approach to ethics. Instead, researchers must engage in ongoing reflection and dialogue with participants to navigate the ethical landscape sensitively and responsively. And this, as argued, requires a shift to processual, relational, and situational

ethics rooted in a community-led approach in order to account for the dynamic contexts in which we interact, in addition to our own biases as researchers.

As Spiel argues [42], humility should be a fundamental aspect of design practice, calling for designers to approach their work with a sense of humility in recognizing their own limitations and biases. Instead of imposing their own interpretations onto participants, designers are encouraged to actively listen and engage with diverse perspectives, valuing the expertise and experiences of all stakeholders involved. Further, Spiel critiques the prevalent approach of solutionism within design [42]. Similarly, we extend that same critique to ethics, its thus far prescriptive approach being, in essence, an attempt at solutions. Amid mounting calls for a community-led approach to accessibility research, we frame our work as a call for a community-led approach to ethics [21].

We believe, in addition, that a feminist approach to community-led ethics, anchored in the principles of care ethics, is an appropriate framework to help inform decisions in complex and dynamic research environments.

A deconstruction of power dynamics is a key aspect of feminist ethics [22], through an understanding of standpoints [20] and situated contexts [18]. This is especially important to consider where children are involved. Children cannot legally consent, which necessitates that researchers seek informed consent from parents or guardians. Within ethics as moral philosophy, recognized agency is a prerequisite for one to be an ethical agent, i.e. to be able to act ethically. This means that the only actors with ethical agency in the context of participatory research involving children are the researchers, in addition to teachers and parents/guardians if they are somehow involved. Children can, of course, assent. They have wants and needs and can often articulate them. As such, a community-led approach to ethics would honor their personhood and center a curiosity around their experiences and desires [42].

In addition, care ethics is inherently relational as it is concerned primarily with human interaction [47]. This positions such a framework in distinctive alignment with the transition to a relational model of disability — enacted and produced through interactions [27]. Indeed, echoing Kafer, this shift underscores the need for a more comprehensive understanding of the contexts in which we operate, which we contend is also the case for our approach to ethics in research.

Spiel's approach raises concerns about the potential for designers to misrepresent participants' experiences and their call for humility and curiosity in design practice emphasizes the importance of actively engaging with uncertainty and complexity [42]. Even further, Spiel calls for a reevaluation of design practices to prioritize inclusivity, responsiveness, and a more nuanced understanding of human experiences, which maps very well with Tronto's phases of care ethics [48], which could be encompassed in Spiel's notion of "response-ability".

Moreover, the processes inherent to participatory research can be mapped to these same phases. In **attentiveness** the caregiver must be attentive and recognize the needs of others, which is akin to needs assessment workshops that often kick-start design processes. Following, in **responsibility** the caregiver must be willing to take action and respond to meet the needs of others, which can be compared to the adaptions made to methodologies and tools when working with underrepresented populations, such as mixed-ability groups of children. Then, in **competence** the caregiver must have the ability to provide care, in a research setting, conducting the fieldwork and engaging directly with participants to meet their needs. Finally, in **responsiveness** the caregiver must consider the perspectives of others in reaction to the care process, as researchers deal with the reactions of multiple stakeholders in the design process, making further in-the-moment adaptions to their tools and methodologies to suit how others are interacting with the design process. These phases are reflected in both our case studies and other similar work [9, 30, 35, 43], suggesting that this approach is widely applicable within this typology of participatory research.

Indeed, responsiveness is the aspect of research we believe should be most improved, in agreement with Spiel [42]. As such, we remain open to criticism and constructive feedback, recognizing that ongoing dialogue and reflection are essential for ensuring that research activities are conducted ethically and responsibly.

3.5 Some Guidelines for Future Studies

Based on the literature and our findings, we suggest some guidelines to improve inclusive ethical engagement in future studies with mixed-ability groups of children. Future studies should incorporate a care ethics approach to ensure reciprocal relationships based on understanding between researchers and participants. This involves being attentive to participants' needs and maintaining ongoing, reflective practices [45]. Researchers should adopt a humble approach, viewing interventions as responses to participants' needs rather than predefined solutions. This includes continuous reflexivity and adaptability throughout the research process [42]. In cross-cultural settings, researchers should avoid generalisations and uninformed assumptions [7, 42], developing culturally nuanced representations that reflect participants' diverse identities. This can be achieved through a community-led approach grounded in active community engagement and the "Nothing About Us Without Us" principle, ensuring marginalised participants are directly involved in the research [49]. Researchers should also be aware of power dynamics in their studies and work to mitigate them through an intersectional and reflexive feminist lens.

3.6 Limitations

A limitation of this paper is that the case studies are representative of only one sociocultural context. It should be noted, however, that similar issues have been reported by other authors in different contexts [43]. Nonetheless, these case studies are not the main contribution and mainly serve to illustrate our call for a shift in the way we approach ethics in the context of participatory research.

Another significant limitation is the inherent challenge of translating the fluidity inherent to the situated nature of contextual ethical considerations into actionable guidance for researchers. Ethics, especially in dynamic educational settings, defies rigid categorization and often requires nuanced, context-dependent responses. Furthermore, this paper acknowledges the subjectivity involved in moving away from solutionism. However, while subjectivity may introduce variability into ethical decision-making, we believe it also represents a strength. Embracing subjectivity allows researchers to tailor their responses to the specific needs and dynamics of each

situation, rather than adhering rigidly to a predetermined code of conduct that is seldom appropriate or effective in all contexts. This reframing highlights the importance of cultivating reflexivity and adaptability in ethical practice, enabling researchers to navigate the complexities of research with sensitivity and responsiveness.

4 CONCLUSION AND FUTURE WORK

As we can see in the preceding case studies, working with children in a mixed-ability setting comes with several added responsibilities and ethical concerns [19, 23], which illustrates the need for a more robust approach to dealing with such complexities. This underscores the necessity for a more comprehensive approach to address these complexities, particularly in terms of researchers' and teachers' involvement in children's peer interactions, the appreciation of individual differences without stigmatization, and the continuous effort to maintain engaging and accessible activities that align with the participants' expectations.

Faced with these challenges, we recognize the benefits of a participatory approach to our research toward a reframing of ethics [21] and inclusive educational technologies [38, 39]. We are, however, mindful of the micro-ethics involved in such complex co-design environments [43]. To help bridge that gap, we find that an approach rooted in care ethics must help inform these decisions [21, 45] through a participatory process of value-sensitive design[10].

Indeed, participatory research, micro-ethics, and care ethics intersect in important ways, especially when working with children in mixed-ability environments. Their intersection points to a more holistic framework for creating inclusive and ethically sound educational environments founded upon ethics that are processual and situational rather than static and prescriptive.

Participatory research emphasizes the active involvement of all stakeholders, including children, in the design and decision-making processes. When applied to mixed-ability settings, this approach ensures that the diverse needs and perspectives of children with varying abilities are considered. Additionally, it empowers these children to have a say in shaping their own learning experiences, thus fostering a sense of agency and inclusion.

Care ethics presupposes that all beings are interconnected and interdependent, highlighting the importance of providing and receiving care as the basis of those interactions [48]. In tandem with a participatory approach to research, care ethics brings a more relational understanding of ethics as it occurs in the interstices of the interactions between people — including those between researchers and participants, children and adults, etc. In the context of this work, care ethics highlights the importance of nurturing and sustaining caring relationships within research and educational settings [45]. When applied to mixed-ability learning environments, an ethics of care calls for a deep understanding of the unique needs and vulnerabilities of each child, with a focus on fostering a supportive environment that is appropriately conducive for learning, as per Tronto's stages of care [47]. Care ethics thus challenges researchers and teachers to prioritize the well-being and emotional development of all children, recognizing that children with disabilities may require care that might deviate from standardized models catering to children who are already mostly likely to thrive under normative settings.

This last point is especially relevant given the ethos of care ethics, particularly as proposed by Joan Tronto, of increasing the value of counter-hegemonic actions that distribute political power and highlight the importance of the collective [46]. In that regard, the goals of both care ethics and participatory design – "aimed at reinforcing democracy by acknowledging and supporting a diversity of voices" [17, 43] – are quite closely aligned. Going even further, however, given the overlap in intentions, we consider community-led design to be a more promising way forward for ethics in HCI and Accessibility. Indeed, community-led design is a movement focused on reframing the approach to co-design with a specific focus on empowering communities to catalyze their own needs through context-based solutions [40].

Beyond those already detailed throughout, there are important challenges to such an approach left to ponder in the future, especially as it relates to working with children specifically. How can we make the shift from prescriptive ethics to situational and processual ethics with the added challenge of centering the personhood of children? How can we ensure that involving parents and teachers as stakeholders does not compromise nor overpower children's autonomy and self-determination in assessing their own needs and values? How can we make sure that the specific needs of children wit disabilities are heard and valued in diverse mixed-ability settings?

We have no singular solutions to these questions. Instead, we hope, we might offer an opportunity for more reflective and carefull ways to address them. We call upon other practitioners of participatory research within the field of accessibility and inclusion to engage in discourse and theory-building regarding the ethics of their own work, building toward greater accountability and understanding.

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