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Submission to participate in IDC workshop
Co-designing with Mixed-ability Groups of Children to Promote Inclusive Education.

(This text reflects my dissertation under production and full paper article for IDC'22:
Pre-schoolers' Stewardship – Embracing Higgledy-piggledy Behaviours through Participatory Plaything)

Statement of interest:
Topic: Co-design and inclusive PD approaches with children
My study with pre-schoolers shows that the topic of your workshop is very relevant and appealing to me. I would love to learn more from your experiences to co-design inclusive co-design sessions. Each (pre-)schooler child carries a great variety in themselves, and as adults, we are responsible for creating environments that connect naturally to these sensitive young participants to let them unfold. In particular, it seems that your workshop participants might have a great diversity of backgrounds. As design researcher and parent, it would make discussions and reflections very interesting to me.

Background
The overarching interest of this almost finalized PhD study reflects a value-oriented research approach that aims to heighten the respect regarding participants in design processes in general, particularly more vulnerable participants such as i.e. pre-schoolers. It also ethically aims to define and strengthen the expression of a pre-schoolers 'voice' by connecting dimensions of pre-schooler play and aesthetical experiences in design research. This PhD will reflect that pre-schoolers are interpreted as capable stewards of design processes, resources for design experimentation, and informants concerning key co-design themes such as participation, design activities and material exploration.

Understanding pre-schoolers as playful participants in participatory design processes
Though child-centred co-creation processes acknowledge the input children can have, it might be difficult to connect as an adult design researcher to a pre-schooler's range of unpredictable expressions and understand what their formulations and gestures reveal. It might also be difficult to join diverse children in a mutual process providing design outcomes with valid data for design researchers. Design researchers face challenges concerning the manners of facilitation (who has to what extent a lead) when involving children to participate in intergenerational design processes [1]. It might be one of the reasons why pre-schoolers as self-reliant participants in design processes were an understudied topic back in 2017. End 2017, this PhD was assigned to explore how pre-schoolers could intuitively connect and explore self-reliantly a design process that implements design thinking.

Before developing the PhD research design, it was necessary to obtain knowledge concerning possible challenges for design researchers through investigating very close a pre-schooler's "hands-on context of activity" [2]. It allowed them to explore their everyday life practice of how pre-schoolers connect with "living and non-living things" [3]. For instance, other children, adults, materials, endeavours, and environments. This preliminary data collection took place at a Danish Reggio Emilia kindergarten. Their pedagogical approach supports self-reliant and self-aware learning activities by incorporating experimenting, play and body sensory explorations as crucial ingredients to discover own capabilities.

Research approach and method

The research approach employed grounded theory [4], ethnographical methods [2] and various qualitative techniques. For example, context mapping, observations, in-depth interviews with pedagogues, photography and field notes. Qualitative data revealed that pre-schoolers display a vast repertoire of body sensory activities during construction play practices. This type of play creates connections between their strong imaginative play and their broad repertoire of ideas and associations [5, 6]. At the same time, it allows for experimental practices [7] and, from a child-development angle, even "*magical*" [8] dynamical interrelations occur between fantasy and intellect. My study interprets this, often high energetic behaviour and higgledy-piggledy body engagement of three to six-year-old children as their particular strength. The type of participation in their immediate context is always a very tangible-oriented participation. This tangible-orientated participation reveals information concerning their aesthetical experiences during their various interactions with each other, endeavours, materials and environment. These preliminary insights led to this current PhD research's focal point of connecting play and design practice by centralizing a design process upon pre-schoolers intuitive construction play practices. Their potential for imagination and experiences comes forth through this play practice, and its processes and results show similarities to the process and expressions of designers engaged in prototyping activities. Accordingly, this study regards pre-schoolers as capable of raising adults' awareness concerning issues surrounding well-known key co-design themes: participation, design activities and material exploration. Based on these data, a 3-step-design process for pre-schoolers got designed as 'plaything with intent' *(PwI), w*hich invites as 'experience design' [9] pre-schoolers to express their intuitive experiences of materials and demonstrate what they, using self-reliance, can do with these.

A pilot study presented at the IDC'19 conference [10] demonstrated that mixed-ability groups of pre-schoolers could experience themselves as protagonists. They expressed their particular domain expertise and capability to self-reliantly design their suggestion for a playground concept despite, e.g., differences in gender, focus, mood or personalities.

Plaything with intent (PwI) methodology

By applying a plaything with intent (*PwI)* methodology (see full paper for details), a PD environment was composed that balanced different personalities, abilities, expressive behaviours, gender and moods. It allowed pre-schoolers to experience intuitive play with a plaything while they experienced the different well-known structure and content of design thinking at the same time. This methodology defines an adult's role as a student of a pre-schooler's footsteps. A design researcher becomes a pre-schooler's apprentice and a pre-schooler a steward of all decision-making

processes during collecting, building and playing. The PwI methodology minimises adult involvement through particular 'adult rules'. These rules for the application of apprenticeship were formulated based on qualitative insights. Time to connect to pre-schoolers is an essential part of this methodology. It creates trust and respect, but it also provides necessary design considerations to establish the intent of a plaything designed for pre-schoolers and essential features to let pre-schoolers experience this intent in the play object design (plaything).

Two case studies

Two mixed groups of pre-schoolers 3-6 years of age were studied at a Reggio Emilia kindergarten.
The first case study's design process had the simple open goal of designing a play experience of their interest. The The second case study's design process goal challenged the pre-schoolers to solve a specific real-life issue with their hands: reducing water waste. This challenge was formulated because the Danish kindergarten is located in Kolding, which must reduce 20% of its water waste until 2025 to align with the sixth sustainable development goal of saving water and struggle to reach this target. Both case studies employed a replicable and child-identifiable system in structure, task, and process. Five playthings were placed in a multiuse room at the kindergarten and had different elements to trigger enjoyment of construction play and stimulate expressive interactions. All adult communication was sensitively anchored upon the individual child's state. Besides interviews, notes and pictures, screenshots of GoPro cameras provided a picture of each minute informing what happened during each minute of each experiment. When looking at one screenshot, these variables were distinguishable in activities and counted for each child following the unfolding of each child's task interpretation.

Results and conclusion

Results demonstrate that pre-schoolers can act as self-reliant stewards while (a) capturing their voice of self-expression effectively and (b) achieving a self-determined specific design concept. Also, results identified a pre-schooler's well-being and motivation for expression as linked to relations of self-awareness – the experience of having a role as an individual and as part of a group. This research clarified those relations and aspects that design researchers could support to create positive informal learning environments for pre-schoolers.
As a further outcome, different dialogue tools were produced. One tool enables reflexivity concerning participant experiences within participatory inquiries. The second tool contributes with a dialogue tool mapping the sensations and connections of how children create tangible expressions as their 'voice'. With these tools, design researchers might create a more natural connection to essential pre-schooler experiences when designing technologies for and with young children. Both tools could assist further research in investigating improvements in well-being and own expression brought about by these in different high-risk groups with lower levels of well-being.

I am interested in researching how to support young children who have experienced traumatic life events or stress to reconnect to caretakers, other children, play and even stir problem-solving activities that might provide a sense of hope, purpose and as 'child with value'.

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