

Teacher's perception on social robots to promote the integration of children with migration background

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ABSTRACT

This paper describes the first steps of an ongoing participatory design with teachers from Switzerland to co-create Human-Robot Interaction setups for integrating children with migration history. The herein presented phase had two main goals: (i) initially mapping the current issues and the teachers' strategy when integrating these children, and (ii) understanding teachers' perceptions regarding social robots for this goal. Results show that teachers we interviewed are already using technology to communicate with immigrant children, not necessarily for inclusion or promote socialisation with their peers, but simply to understand them. Findings also point to a well-defined application of social robots in inclusion activities, even when never seeing or using them, which contradicts previous results in the literature and which gives potential ways to unfold the next steps of the participatory design.

CCS CONCEPTS

• **Human-centered computing** → **Interaction techniques**; • **Applied computing** → **Education**; • **Computer systems organization** → **Robotics**.

KEYWORDS

Children Robot Interaction, Integration of Children with Migration Background, Social Robots and Teachers

1 INTRODUCTION

Children with migration backgrounds have often moved from one country to another during their childhood, or they have at least one of their parents with a similar background [2]. Due to this fact, several differences between their previous cultural background and social environment where they were born and the new cultural background where they are currently living may affect their social inclusion, defined as participation in community activities, engagement in leisure and play, and access to quality inclusive practices in the classroom [7]. Children with migrant backgrounds often suffer from weaker learning outcomes and performance in the classroom in comparison to children with no migrant background [11].

Against this background, this study investigates teachers' expectations, insights, and experiences of appropriating social robots to classroom activities to promote the social inclusion and integration of children with migration backgrounds at primary school. We motivated this study by the results of recent research using embodied

robots to increase students' performances [6] and also for inclusion among their peers [1, 3, 9]. Therefore, we postulated that such robots hold a potential to promote and enhance the inclusion of children with migrant background. However, individual, organisational and cultural challenges of appropriating social robots to educational system are necessary for their effective application [8, 12].

We conducted 5 semi-structured qualitative interviews with teachers at the primary school to investigate the current challenges of promoting social inclusion of children with migrant backgrounds in the classroom and teachers' expectations and experiences of using social robots in classroom activities. Data was analyzed with a thematic analysis to answer the research questions: **(RQ1)** What are the main challenges teachers are facing regarding inclusion of children with migration background and their potential causes and teachers' current approaches?; and **(RQ2)** What kind of robot-mediated activities could promote the social inclusion of children with migrant backgrounds in the classroom according to teachers?

Data consists of 5 semi-structured qualitative interviews with teachers at a primary international school in Switzerland that has English as the teaching language. Participant teachers were 5 women teaching in International private schools and they ended up being all from the same school. The interview unfolded as the following. The researchers greeted the interviewees and then asked 3 blocks of questions: The first block regarding their years of experience teaching, and the age range and the current subjects they were teaching in the current year. The second block was about their current issues and potential solutions they are currently handling, as well as the technologies they are already applying in this process. Finally, the third has two steps: first, asking their raw perception regarding robots and how to use them in inclusion contexts and, second, showing them pictures, videos, and live demos of activities being developed with robots and then asking them the same question as before to validate whether their perception has changed after seeing examples¹.

2 RESULTS AND DISCUSSION

2.1 RQ1: Problems, causes, and approaches

All the teachers interviewed stated that they normally did not see any problems with inclusion in the school overall, although they

¹This study has received ethical approval from the Human Research Ethics Committee of EPFL under protocol HREC 057-2021

recognized existing challenges to be overcome in implementing their inclusion policy. They associated this success to the way they approach such issues and to the economic status of students' parents, and the fact that these students are used to the constant moving. When analyzing teachers' answers, the challenges they identified can be grouped in three main clusters of **children's age, language, and cultural background**.

Regarding age, young children do not necessarily need to orally communicate to socialise and their mistakes in the idiom are not an issue to themselves. They mostly need to feel welcomed, which is achievable through the actions and attitudes of the staff, such as a fast response to their crying and strong empathy when they get hurt or feel embarrassed. Furthermore, when teachers realize children are making maneuvers, they try to distract them.

On the other hand, for older children (5 to 10 years old) language does play a pivotal role in the ability to communicate with peers and that is an important aspect for the sense of belonging to the group. For this sense of belonging, it is also important that newcomers have someone to trust and to calm them down during the adaptation process. At this stage, it is way more common to identify embarrassment at making mistakes in front of their classmates. Teachers reported using the strategy of associating students of the same language that are more integrated as a peer-guide to newcomer students, and said there are languages that are not easy to find peers for this task. Finally, the 3 teachers of this age range reported to use translating apps to communicate with students in cases where they can not find a common language or another student to translate.

Not surprisingly, cultural differences are also points of interest for integration. Gestures like simply pointing out people or things are common for daily expressions in occidental culture, but might be considered an offence in some places of Asia, as one of the teachers exemplified. Understanding local "social rules", costumes, and holidays (that might be mostly religious celebrations) were also pointed by the teachers as correlated points to students' sense of belonging. In this specific case, teachers normally approach integration practices embedded in their regular activities.

2.2 RQ2: Social robots as alternatives

We asked the teachers about their perception on robots, before presenting them the demos, teachers mentioned the robotic activities students develop as part of their regular curriculum, in the so-called STEM Room. In such activities, students learn about programming, physics and maths using programmable educational robots. However, teachers said they never used robots beyond this curriculum, as integration activities, for instance. Teachers also said these robots are not capable of directly approaching languages activities or even promoting social integration by themselves. This point is one of the main advantages social robots have over programmable robots.

After giving them an explanation about social robots and questioning how they would envision this kind of robot on their assistance for integration, they answered mostly suggesting the robot as an assistant or an embedded version of a translator app (or, using one of the teachers' words: "a fancy version of Siri"). We then showed live demos and videos of activities with the Cozmo

robot, the Cellulo robot [4, 5] and the QTrobot and received their comments on the group activity these robots can promote.

Differently to works on the literature [10], teachers are now more aware of the possible applications of social robots. This fact may be related to the popularisation of existing technologies, such as translation apps, and also to the emergence of new ones, such as ChatGPT, where, after coming into contact with them, one can easily perceive how to incorporate them into embedded agents.

2.3 Future applications

After the interview and the discussion, teachers seemed to understand better the applications and the limitations of social robots. As future directions, teachers of young children suggested to use social robots exclusively for body-related topics, such as dancing activity for integration, and for teaching body awareness and vocabulary in the local language for their pupils. They also pointed out to use the robot to stop younglings crying by distracting them, as one of the strategies mentioned beforehand. Conversely, for older children, teachers suggested the robot could take more social and communicative roles. For instance, playing the peer-tutor of the same language to newcomers; being a company for handwriting tasks, if pupils' alphabets are different from the one being taught; as a language learning companion, since children would not feel judge by the robot; as a lecturer (being a peer of a tutor) of the local costumes, teaching local costumes by storytelling; as a mediator in paired language learning activities between two students with different mother-tongue; and, once again, promoting social activities where students need to interact between themselves regardless the language.

3 CONCLUSION

In general, teachers had realistic initial conceptions of using the technology in their favour and progressively providing them with knowledge, demos, and discussions about social robots helped them to achieve affordable and more complex projects towards this direction. As a limitation, the interview was performed in only one international school in Switzerland and does not represent the generalised sample. Furthermore, all the teachers mentioned technical issues as a downside since they would not be able to handle them if they happen. Nonetheless, all of them claimed willing to follow up in deploying the activities.

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