Robots for Learning 7 (R4L): A Look from Stakeholders' Perspective

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ABSTRACT

This year's conference theme "HRI for all" not just raises the importance of reflecting on how to promote inclusion for every type of user but also calls for careful consideration of the different layers of people potentially impacted by such systems. In educational setups, for instance, the users to be considered first and foremost are the learners. However, teachers, school directors, therapists and parents also form a more secondary layer of users in this ecosystem. The 7th edition of R4L focuses on the issues that HRI experiments in educational environments may cause to stakeholders and how we could improve on bringing the stakeholders' point of view into the loop. This goal is expected to be achieved in a very practical and dynamic way by the means of: (i) lightening talks from the participants; (ii) two discussion panels with special guests: One with active researchers from academia and industry about their experience and point of view regarding the inclusion of stakeholders; another panel with teachers, school directors, and parents that are/were involved in HRI experiments and will share their viewpoint; (iii) semi-structured group discussions and hands-on activities with participants and panellists to evaluate and propose guidelines for good practices regarding how to promote the inclusion of stakeholders, especially teachers, in educational HRI activities. By acquiring the viewpoint from the experimenters and stakeholders and analysing them in the same workshop, we expect to identify current gaps, propose practical solutions to bridge these gaps, and capitalise on existing synergies with the collective intelligence of the two communities.

CCS CONCEPTS

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

KEYWORDS

Participatory design, Inclusive learning, Educational robots

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Recently completed her Ph.D. at the Computer Human Interaction for Learning and Instruction lab at EPFL, Lausanne, Switzerland where she was also an EU ITN Horizon 2020 Marie Curie fellow at ANIMATAS. Her Ph.D. research, introducing Productive Engagement for educational robots, focuses on critically analyzing the relationship between engagement of students and learning in educational human-robot interaction settings. Her research interests broadly include human-machine interaction, multimodal behavioral analysis, applied machine learning, and social robotics.

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from Utrecht University focusing on young children's second-language learning with social robots. She is currently working on the use of social robots to support multilingual students' learning.

Sarah Gillet, KTH, Sweden, sgillet@kth.se
Sarah Gillet is a Ph.D. student supervised by Iolanda Leite at KTH Royal Institute of Technology in Sweden. Her research aims to create robots that improve human-human interactions while acting fully autonomously. In her recent work, she explored, for example, how social robots can support processes of inclusion among children or showed how offline reinforcement learning could help to learn social robot behaviors for groups.

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Arzu Guneysu is a Postdoctoral researcher at KTH and Digital Futures Fellow. Arzu got a Ph.D. in Robotics on "Designing Gamified Activities with Haptic-Enabled Tangible Robots for Therapy and Assistance" from EPFL, in 2021. Her research interests include various topics in Human-Robot Interaction, Special Education, Adaptive Robot-Enhanced Therapy, Iterative Design, Inclusive Design, Neurodevelopmental Difficulties, Gamified Therapy and Training, Healthy Aging, and Intergenerational Practices for Elderly and Children.

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Senior Lecturer in the School of Computer Science and IS at the University of Melbourne, and Adjunct Senior Lecturer at UNSW Sydney, Wafa obtained her Ph.D. from the University of Grenoble focusing on bodily signals in child-robot interaction and affective reasoning for social agents. Her research aims at creating acceptable and useful assistive robot interactions using social signal sensing, affective and cognitive reasoning, and natural expressivity. She has a particular interest in how robots can be used as co-learner - learning with and from humans.

2 OVERVIEW OF THE WORKSHOP

With technological tools becoming a part of our everyday lives now more than ever, there is an increasing trend of incorporating robots in educational settings [1, 3, 4]. However, HRI experiments in school environments affect more people than just the students that participate in them. Teachers, school directors, school staff, and parents are good examples of stakeholders that should be considered during the experimental design since the outcomes of such studies have a direct or indirect influence on them [2, 5].

How are we as researchers, whether in educational institutes or in industry, handling this issue in our studies? How do these stakeholders perceive our intervention, and how far can it impact their work and synergy with the students?

The Robots for Learning workshop, in its 7th series, embraces the theme of the HRI'23 conference "HRI for all" and offers an opportunity to approach and debate (in a hybrid mode) stakeholder factors in HRI experiments in school environments with a special focus on teachers. This reflection is expected to provide insight and understanding about the stakeholders' perception of researchers that are - already or planning to - perform experiments in schools with social robots.

As a result of the workshop, we expect to shed light on important questions such as: what are good practices for including

stakeholders in education in HRI, specifically teachers, when building effective educational human-robot interactions including but not limited to activity design, modelling learning and it's peripheral skills, and development of robot behaviours and interventions? What are the key elements that are needed to create a strong synergy between teachers and researchers? How to give longevity to HRI applications in classrooms? Which studies have been most successful in addressing these questions and what do they have in common?

3 TENTATIVE PROGRAM

We present below the tentative schedule for the workshop that will be synchronised with the lunch and coffee arrangements.

08:30-08:40	Introduction
08:40-09:00	Ice-Breaking activity
09:00-10:00	Presentations and Q&A
10:00-10:40	Panel with specialists
10:40-11:00	Coffee Break
11:00-11:40	Panel with stakeholders
11:40-12:20	Group discussions
12:20-12:30	Conclusion & Wrap up

4 TOPICS COVERED

R4L 2023 invites contributions on topics including but NOT limited to:

- Educational robots for adults, children and people with special needs
- Implementing robots into school curricula
- Measuring educational and qualitative outcomes like learning gain, relationships etc.
- Reflections on best practices for working with stakeholders
- Stakeholders' perspectives
- Robots for learning that focus on a variety of stakeholders
- Robots for inclusion
- Ethnography for robots in education

4.1 Information on the two Panel discussions

We plan to have two panel discussions. The first panel is arranged with specialists in the area and the second one is with stakeholders. In both panels, we will ask the panellists to share their perspectives and experience to be later reflected on by participants and organisers of the workshop.

4.2 Panel with the Specialists: The experimenters' point of view

In this panel, we plan to discuss the inclusion of stakeholders with experts from the HRI community on performing experiments in educational environments, both from academia and industry.
Topics:

- Their personal experience involving stakeholders in the experiments
- Main issues in the intervention design (concerning stakeholders)

- How to clearly communicate with the stakeholders about:
  - The importance of the experimental research
  - Their and your constraints
  - Time management in experiments
- Lessons learned from failures
- Good practices in educational environments

Invited Panellists:

- Aditi Ramachandran, Chief Technology Officer at Van Robotics.
- Iolanda Leite, Associate Professor at the Division of Robotics, Perception and Learning at KTH Royal Institute of Technology.
- Matthijs Smakman, Associate Professor at Institute for ICT, HU University of Applied Sciences Utrecht.

4.3 Panel with the Stakeholders

In this panel, we will hear and reflect on the stakeholders' perspectives.

Topics:

- Their personal experience regarding researchers' experiments with their students
- Longevity problems in the studies
- How to clearly communicate with researchers/specialists about:
  - The challenges and concerns in technology integration or conducting experiments with researchers
  - Expectations - to which problems robots might have a potential to provide solutions in educational settings
  - Their and your constraints
  - Time management in experiments
- Good practices in educational environments

The panels serve as a basis for a productive and engaging discussion among workshop participants based on three topics: (i) understanding what has already been achieved by the field regarding stakeholders policy and inclusion and where the field is currently placed regarding this matter, (ii) what are and how to address, with social robots, issues regarding inclusion of the stakeholders, and (iii) how to extend our studies' outreach to beyond researchers' intervention, promoting their long-lasting impact.

Invited Panellists:

- Paul Magnuson, Director of Research of the Leysin American School Educational Research Group, Switzerland.
- Müge Uysal, teacher at Turebergsskolan, Sollentuna.
- Soraya El Farhane, Psychomotor therapist at Hôpital Pitié-Salpêtrière, Paris.

4.4 Participants pitch presentation

The *presentations* will give an opportunity to the authors of the accepted papers to showcase their work briefly. The motivation behind the *panel discussions* is to gauge the perspective and experience of the two sides, specialists and stakeholders. Further, we expect these discussions to surface relevant topics that will guide the *group discussions* among workshop attendees on how to bridge the gap between the two perspectives.

5 TARGET AUDIENCE OR PREREQUISITES

We invite participants to report previous or planned research, practice and interest in developing applications in social robots for learning. Researchers from HRI, robotics and educational backgrounds will be invited to contribute. The workshop will be advertised by sending a call-for-interest on robotics and technology for learning mailing lists and using social networks. Various projects involved in the organization will also be encouraged to participate (CoWriter, Cellulo, SAR NSF Expedition, eCUTE, DREAM, ANI-MATAS, iReCheck . . .). Previous editions of workshops on similar topics were held at RoMan 2016, HRI2017, HRI2018, HRI2019, HRI 2020. The workshop will also be advertised to the people who attended the previous editions (a mailing list with about a hundred contributors over the years has been constituted).

6 APPROACH FOR RECRUITING PARTICIPANTS

We will invite paper submissions of novel work or summaries of past work that focus on stakeholders in school environments. We further allow submissions of short paragraphs in which participants are invited to explain their intentions concerning the involvement of stakeholders, with a focus on or involving teachers, for planning HRI experiments in school and educational environments. With this second way of recruitment, we hope to provide easy access to the workshop and allow participants to prepare in advance for their participation.

7 PLAN FOR DOCUMENTING THE WORKSHOP

The proceedings of the workshop will be made available on our website, https://robots4learning.wordpress.com/r4lhri2023/ Participants will also be encouraged to submit to special issues on Journals, such as the Frontiers Robots and AI Research Topic on robots for Learning, https://www.frontiersin.org/research-topics/14092/robots-for-learnin, that we are currently negotiating. With the permission of the participants, we also plan to upload the videos recorded from zoom to a specific private YouTube channel.

8 ACKNOWLEDGMENTS

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