

Robots will never replace teachers but can boost children's education

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One of the robots used in the University of Plymouth's Robo21c program, which aims to complement to the school curriculum by developing teachers' skills and understanding of robotics and programming. Credit: University of Plymouth

Robots can play an important role in the education of young people but

will never fully replace teachers, a new study suggests.

Writing in *Science Robotics*, scientists say social robots are proving effective in the [teaching](#) of certain narrow subjects, such as vocabulary or [prime numbers](#).

But current technical limitations—particularly around [speech recognition](#) and the ability for social interaction—mean their role will largely be confined to that of [teaching assistants](#) or tutors, at least for the foreseeable future.

The study was led by Professor in Robotics Tony Belpaeme, from the University of Plymouth and Ghent University, who has worked in the field of [social robotics](#) for around two decades.

He said: "In recent years scientists have started to build robots for the classroom—not the [robot](#) kits used to learn about technology and mathematics, but social robots that can actually teach. This is because pressures on teaching budgets, and calls for more personalised teaching, have led to a search for technological solutions.

"In the broadest sense, social robots have the potential to become part of the educational infrastructure just like paper, white boards, and computer tablets. But a social robot has the potential to support and challenge students in ways unavailable in current resource-limited educational environments. Robots can free up precious time for teachers, allowing the teacher to focus on what people still do best—provide a comprehensive, empathic, and rewarding educational experience."

The current study, compiled in conjunction with academics at Yale University and the University of Tsukuba, involved a review of more than 100 published articles, which have shown robots to be effective at increasing outcomes, largely because of their physical presence.

However it also explored in detail some of the technical constraints highlighting that speech recognition, for example, is still insufficiently robust to allow the robot to understand spoken utterances from young children.

It also says that introducing social robots into the school curriculum would pose significant logistical challenges and might in fact carry risks, with some children being seen to rely too heavily on the help offered by robots rather than simply using them when they are in difficulty.

In their conclusion, the authors add: "Next to the practical considerations of introducing robots in education, there are also ethical issues. How far do we want the education of our children to be delegated to machines? Overall, learners are positive about their experiences, but parents and teaching staff adopt a more cautious attitude.

"Notwithstanding that, robots show great promise when teaching restricted topics with the effects almost matching those of human tutoring. So although the use of robots in educational settings is limited by technical and logistical challenges for now, it is highly likely that classrooms of the future will feature robots that assist a human [teacher](#)."

More information: T. Belpaeme at Ghent University in Ghent, Belgium et al., "Social Robots for Education: A Review," *Science Robotics* (2018). robotics.sciencemag.org/lookup.../scirobotics.aat5954

Provided by University of Plymouth

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