

## I-RIM CONFERENCE 2021

### *Online Workshop*

## **Robotics for Education: How robots can improve and innovate learning and teaching for a better society**

**8 October 2021, 15:30-17:30 CET**



Photo Credit: UNICEF Afghanistan (2020)/Facel

### *The Afghan Dreamers*

“This long-term effort on education is critical. If we look at it from the perspective of future competitiveness in the robotic-related areas, we will need investments in R&I, as well as in large-scale testbeds and, in parallel, to develop a highly skilled community. This is the path to modernise our educational systems along with the shift in the job demand. Let me recall that 45% of the created jobs in the EU until 2030 will be in sectors requiring highly skilled people and the robotics sector is certainly one of these. Our objectives for European citizens’ digital literacy are therefore ambitious and include AI and robotics.”. (European Commission Joint Research Group, *What Future for European Robotics? A Science for Policy Perspective*, 2021).

Various authoritative sources and many official and individual voices call for significant innovation in education in Europe to ensure an active, capable and responsible citizenship.

One of the innovative tools that have become part of the everyday life of many schools and universities is educational robotics.

Educational robotics (ER) is a growing field with the potential to have a significant impact on the methodology of learning and teaching, from kindergarten to university.

From the early days of Seymour Papert and Mitchel Resnick’s *Logo* to the present day, extensive literature shows the benefits of using robots in education, in supporting STEM subjects, in gender education, in inclusive teaching. (Daniela, 2019).

Robots can be used as teachers’ assistants to sustain learning outcomes and critical competencies such as engineering thinking, math, physics, computational thinking, among others, starting from pre-school to a higher education level.

Demonstrated learning benefits of ER are:

- *Interest in science and engineering*: studying robots and with robots can generate enthusiasm for the follow-on study of science and engineering;
- *Teamwork*: robotics is complex and embraces many fields; each student will find his or her field of application;
- *Problem-solving*: learning with robots teaches students how to operate sophisticated systems that can learn and interact with the environment. The student will develop complex, critical and divergent thinking. (Miller, Nourbakhsh, 2016).
- Educational robotics is now an exciting application area with a growing market, projected to grow from USD 1.3 billion in 2021 to USD 2.6 billion by 2026 (<https://www.marketsandmarkets.com/>)

In the form of round table, the workshop aims to offer an overview of the state of the art of educational robotics as a tool for inclusive education (Linda Daniela). To provide a picture of the helpful link that educational robotics can offer between school, university and society as a whole (Bruno Siciliano). To show the development of the sector from the first pioneering interventions to the present day (Emanuele Menegatti). To present some reflections on the pros and cons of robotics in education, the necessity to model, identify and assess the new learning system differently, with particular reference to the ethical and societal aspects (David Scaradozzi). To describe the benefits of AI and educational robotics as an inclusive educational tool, with particular interest in the robotics contests (Emanuele Micheli), and as a valid support for the distant and blended learning (Picarella).

### Organizers

- **Fiorella Operto**, School of Robotics, Italy
- **Emanuele Menegatti**, University of Padua, Italy

The seminar is *free of charge* and will be held in Italian, except for the talk by Prof. Linda Daniela, in English.

A few days after the seminar, the recorded lectures, texts and power points will be published on: [www.scuoladirobotica.it/en](http://www.scuoladirobotica.it/en)

### Program

#### *Opening:*

**Linda Daniela**, Dean of the Faculty of Education, Psychology and Art, Chair of the Council for Promotion in Pedagogy of the University of Latvia: *Educational Robotics for the Inclusive Education*.

#### *Round Table*

**Bruno Siciliano**, Full Professor of Control and Robotics at the University of Naples Federico II, Director of the ICAROS Centre, Coordinator of the PRISMA Lab, Italy: *Robotics as a link between school, university and society*.

**Gloria Sormani**, Country Manager, Universal Robots: *Collaborative robotics, a bridge between schools and SMEs*.

**Emanuele Menegatti**, Full Professor of Robotics and Autonomous Systems, Head of the IAS-Lab, University of Padua, Italy: *15 years of Education Robotics from pioneering to school curriculum*

**David Scaradozzi**, BEng, MEng, PhD, Assistant Professor at the Dipartimento di Ingegneria dell'Informazione, Università Politecnica delle Marche, Italy: *Is Educational Robotics the right tool to face the future pivotal challenges of society?*

**Emanuele Micheli**, President of the School of Robotics, Italy: *AI and robotic as tools for an inclusive education*.

**Marco Picarella**, La Fucina delle Scienze s.c.s and Eximotion srl, Italy: *REaD: Distance Education Robotics, needs and opportunities of a new didactics*.

*Moderator:* Fiorella Operto, School of Robotics, Italy

**FOR WHO:** teachers, educator, scholars of education, support teachers, students

#### **HOW TO REGISTER:**

[https://us02web.zoom.us/webinar/register/WN\\_A4XAcXWDRVaPsgh-I08PTQ](https://us02web.zoom.us/webinar/register/WN_A4XAcXWDRVaPsgh-I08PTQ)

**Information:** [operto@scuoladirobotica.it](mailto:operto@scuoladirobotica.it)

### References

Daniela L. (Ed). (2019). *Smart Learning with Educational Robotics. Using Robots to Scaffold Learning Outcomes*. SpringerMiller P., Nourbakhsh I (2016). *Robotics education*. In: Siciliano and Khatib (Ed's). Springer Handbook of Robotics.