

Digitally Supported Inclusive Practices in Education and Training

Workshop on opportunities and practical challenges related to inclusive EdTech

Susan Beudt¹, Sebastian Claus², Alexander Heuts³ and Niels Pinkwart⁴

In the course of increasing digitalization of all aspects of life, it is more important than ever not to exclude anyone. The vision of both quality and reduced inequality (SDGs 4 and 10) in education is set out in the 2030 Agenda⁵. Specific and, if ratified, legally binding requirements are defined in the UN Convention on the Rights of Persons with Disabilities⁶. The objective to accomplish inclusive education in the future underlines the importance of analyzing and discussing the opportunities and challenges of applying digital technologies and AI-based systems in educational contexts.

Digital technologies and AI applications have the potential to improve equal access to all levels of education and training. Solutions can be tailored to the needs of marginalized groups, including persons with disabilities. For instance, AI applications can adapt automatically to specific user needs according to the situation at hand. Such systems allow for highly personalized on-the-job training and can advance the participation of persons with disabilities in vocational training. It is also necessary to explore ways to better inform prospective employers about the immense opportunities that lie in the use of digital technologies and find good means to raise awareness of the strengths and competencies of persons with disabilities.

However, educational realities often differ from the vision outlined above. Just recently, digitalization was pushed fast forward due to the pandemic situation, and it became even more apparent that one of the many challenges in digital education is, in fact, inclusion. Persons with disabilities may once more experience learning barriers because educators and trainers are left with technologies at their disposal that are not at all or only insufficiently accessible. Additionally, highlighting the social and cultural dimension of inclusion in digital education, it can be observed that learning barriers are affecting a far

¹ Deutsches Forschungszentrum für Künstliche Intelligenz GmbH, Educational Technology Lab, Berlin, susan.beudt@dfki.de

² Humboldt-Universität zu Berlin, Department of Computer Science, Berlin, clausseb@informatik.hu-berlin.de

³ Humboldt-Universität zu Berlin, Department of Computer Science, Berlin, alexander.heuts@hu-berlin.de

⁴ Humboldt-Universität zu Berlin, Department of Computer Science, Berlin, pinkwart@hu-berlin.de

⁵ United Nations, Convention on the Rights of Persons with Disabilities, <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/convention-on-the-rights-of-persons-with-disabilities-2.html>, accessed: 26/11/2020.

⁶ United Nations, 2030 Agenda for Sustainable Development, <https://sustainabledevelopment.un.org/post2015/transformingourworld>, accessed: 26/11/2020.

higher percentage of the population. Development and design of today's educational technologies, be it AI-driven or not, is rarely done with a diverse user group in mind. Thus, cultural and gender biases can often lead to technology that segregates specific user groups. Also, AI-based systems may even aggravate existing social injustice.

This workshop invited researchers to explore the potential and practical challenges of digitally supported inclusive education and training. In some projects, the Department of Computer Science at the Humboldt-Universität zu Berlin (HU Berlin) and the Educational Technology Lab at Deutsches Forschungszentrum für Künstliche Intelligenz GmbH (DFKI) are working on inclusion and accessibility-related questions in schools, universities, vocational training, and vocational rehabilitation. As part of the workshop, we planned to present work in progress from selected research projects that aim to remove barriers in various educational contexts and foster capacity building at an individual level. The workshop aimed at bringing together researchers to present related work and discuss the potential of EdTech applications. We were especially interested in discussing what conditions should be met to provide successful technological support for inclusive educational processes and what requirements are imposed on (adaptive) educational technologies in inclusive educational contexts.

We invited submissions to topics such as:

- Cooperative learning in an individualized educational reality
- Conditions of successful EdTech application in inclusive education
- Adaptivity of educational technologies to support inclusive education
- Learning methods for physically or mentally impaired persons
- Novel mechanisms for adaptation of teaching /learning content
- Participation of marginalized groups in EdTech Design and Development
- Supporting marginalized groups beyond disabilities (i.e., social and cultural implications of EdTech)
- Ethical issues related to the use of AI applications for persons with disabilities

With this workshop, we follow up on the conference theme of last year's *Participation in education and science - access and barriers in the digital educational world* (DELFI 2019). We observed a growing interest in inclusive and accessible educational technologies and want to further this development. Therefore, we aim to provide a platform for developing future collaborative projects by initiating a series of subsequent workshops on this topic. Inclusion and equality in education also emerged as a prominent topic across the co-located EC-TEL (theme: *addressing global challenges and quality education*) and HDI (theme: *diversity in teaching*) conferences. We opened this workshop to EC-TEL to facilitate an interdisciplinary exchange among the research communities.

We welcomed contributions that represent work in progress, innovative ideas for future research, hands-on experiences with the application of digital technologies and AI-based systems in related use cases, and critical reflections on related topics. It was also possible to submit 2-4 pagers presenting early work and experiences as well as PhD research.

The workshop was organized by

- Susan Beudt, DFKI (Chair)
- Sebastian Claus, HU Berlin (Chair)
- Alexander Heuts, HU Berlin
- Niels Pinkwart, HU Berlin, DFKI

We received a total of five submissions for the workshop. Each of the submitted papers was peer-reviewed by two members of the program committee

- Susan Beudt, DFKI
- Sebastian Claus, HU Berlin
- Alexander Heuts, HU Berlin
- Thomas Köhler, TU Dresden
- Ulrike Lucke, University of Potsdam
- Niels Pinkwart, HU Berlin, DFKI
- Xiaohan Zhang, Jiangsu Normal University

based on the Call for Papers⁷. Four contributions were accepted for publication and are included in this volume.

The workshop “Digitally supported inclusive practices in education and training” was embedded in a full-day event. It was hosted in the second half of the day and presented and discussed submitted research papers. The workshop was held in conjunction with the workshop “Educational media technology and its inclusive potential”. That workshop took place in the first half of the day and consisted of invited formats only.

⁷ Official Workshop Website: <https://inclusive-edtech.dfki.de/workshop2020/>