Special Issue "*Learning from AI in Primary Education*"

Learning & Instruction

Call for papers

Learning and Instruction is currently inviting submissions for a Special Issue (SI) titled '*Learning from AI in Primary Education*'.

Overview

The promise and expectations of Artificial Intelligence (AI) to help and/or improve education are high. Gates (2023) stated in his column that "*the age of AI has begun*". According to him, ICT has not managed to live up to the expectations for education, but it is his belief that AI will, as it is capable of helping the student in their zone of proximal development both at a cognitive level and at the level of self-regulation. AI, by definition, learns from experience, and hence can adapt to the learner (Poole & Mackworth, 2017). Furthermore, the teacher may benefit by receiving help in, for example, giving feedback. Most of the research so far has centered around adolescents and beyond, as evidenced in the work of Kulik and Fletcher (2016). Thus, the current Special Issue (SI) is focused on research conducted within preschool/kindergarten and primary school settings. We seek to explore how the integration of AI in this target group can potentially benefit the upcoming generation, uncovering for example the impact and potential advantages that AI offers at an early developmental stage.

The call of papers seeks research that represents the current state of the art regarding research on the effectiveness of using AI in preschool/kindergarten and primary schools. We are particularly keen on research that demonstrates the enhanced efficacy of AI, especially through a comparative study approach. This involves contrasting the outcomes of a control group using a "non-intelligent" iteration of a system, as presented in the work of Suraworachet et al. (2023).

The proposed special issue complements a recent SI in Computers & Education, which is focused on issues such as equity, responsibility, fairness, accountability, and transparency when developing AI in Education. Furthermore, it nicely complements the research on secondary education and later, as mentioned above (Kulik & Fletcher, 2016).

Keywords

Preschool, Kindergarten, Primary Education, Artificial Intelligence (AI), Experimental design

Objective

To examine frontier issues of AI in education. We seek fostering evidence-based examples of learning from AI from preschool to primary education.

Indicative Topics

Learning to read, development of numeracy, scientific thinking, reading comprehension.

Guest Editors

Prof. Dr. Eliane Segers, Radboud University, The Netherlands
Dr. Paraskevi Topali, Radboud University, The Netherlands
Prof. Dr. Carla Haelermans, Maastricht University, The Netherlands

Rationale for publication

While the concept of Artificial Intelligence (AI) appears since the first half of the 20th century, recently AI received increased attention due to its rapidly evolving way to grow and impact the way people interact, work and live. The rise and massive use of AI systems, such as ChatGPT and DALL-E, came along with significant interest and at the same time concerns about the expanding capabilities of generative AI (Bond et al., 2023). These discussions did not leave unaffected the education sector prompting, according to UNESCO's Strategy Plan, the necessity of guaranteeing the responsible use of AI attending teachers' and students' AI literacy, assessment, ethical considerations and trust.

In 2018, the Horizon report (Educause, 2018) pointed out AI and adaptive learning technologies as the leading advancements in educational technology. The introduction of AI in education (AIEd) has been seen as an opportunity for personalized learning experiences, distribution of intelligent educational content, and efficiency in managing teaching practices among others (Chen, Chen & Lin, 2020); a) intelligent tutoring systems can adapt to students' learning paces and styles offering tailored assistance, b) AI-driven educational platforms facilitate real-time feedback and assessment, allowing educators to identify critical learner behaviours and provide timely interventions, c) AI-based virtual assistants and chatbots can offer immediate support within a more interactive environment addressing queries and providing additional resources.

However, the initial research focus has primarily centred around the use of AI on higher education exploring mainly technical aspects of AI, e.g., technical aspects, developing and advancing algorithms and machine learning and deep learning techniques (Xia et al 2023). Empirical research on the roles, effects, and implications of AIEd is limited and even more limited in educational settings apart from higher education (Ouyang, Zheng, & Jiao, 2022). This knowledge gap emphasizes the necessity of exploring the potential advantages of AI integration from preschool to the end of primary school (sixth grade), shedding light on the potential benefits and drawbacks of integrating these novel technologies into educational practices (Kulik & Fletcher, 2016).

The current SI aims to meet this need by offering a space for papers that research the effects of AI proposals within such educational settings. We invite submissions of empirical contributions about the *added* value of AI (see e.g., Mostow et al., 2003 for an example on the added benefits of speech technology in learning to read). We deem that the SI can provide valuable insights on AIEd in children and can indicate potential avenues for future research attending the needs of the educational researchers, policymakers, and practitioners.

Manuscript submission information

As an international, multi-disciplinary, peer-refereed journal, Learning and Instruction provides a platform for the publication of the most advanced scientific research in the areas of learning, development, instruction, and teaching. This 2024 Open Call for a Special Issue of Learning and Instruction solicits high-quality proposals that will be evaluated in a highly competitive procedure. We invite colleagues to submit the manuscript any time before the deadline. For any inquiries about the appropriateness of contribution topics, please contact Dr. Eliane Segers **eliane.segers@ru.nl**.

The journal's submission platform (Editorial Manager®) is now available for receiving submissions to this Special Issue. Please refer to the Guide for Authors to prepare the manuscript and select the article type 'VSI: Learning from AI in Primary Education' when submitting your manuscript online. Both the Guide for Authors and the submission portal can be found on the journal Homepage here: https://www.elsevier.com/journals/learning-and-instruction/0959-4752/guide-for-authors. Interested authors are asked to submit:

a) the manuscript title and an abstract of up to 1000 words (excluding references, figures and tables), and
b) a short bio of authors (150 words maximum per author) to the guest editors.

Abstracts will be reviewed, and selected authors will be invited to submit a full manuscript for consideration for inclusion in the special issue.

Submission timeline
Outlined below are the key dates to remember:

1.	Extended abstract, title and author bio submission	September 1, 2024
2.	Notifications of the accepted abstracts	October 31, 2024
3.	Full paper submission	May 1, 2025

Origin of the proposal
The idea of the proposal stems from the establishment of the Netherlands AI lab for education (NOLAI).

List of potential reviewers
Each paper will have two reviewers; one from another paper that was submitted to the SI and one external reviewer, based on their expertise with the content of the paper.

References

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Biography and contact details of the Guest Editors

Eliane Segers is professor of Learning and Technology at the Behavioural Science Institute at Radboud University (since 2018), and member of the scientific team of the Dutch National Education Lab AI. After receiving her PhD in Multimedia support of early literacy learning (2003), she became assistant professor at Radboud University, and later associate professor. In 2016, she became full professor of Reading and Digital Media at Twente University, a position which she held till January 2023. Since 2018, she holds a status-only appointment at the Ontario Institute for Studies in Education at the University of Toronto, Canada. Her research focuses on individual variation in learning and learning problems and with a specific interest on how the use of ICT may foster learning. Her research has both a fundamental and an applied focus, with a strong societal relevance. In line with the topic of this special issue, she is currently PI on a large project focusing on opportunities and challenges of multiple digital text comprehension in children, and recently received together with a large consortium, a grant on Youth and Digitization to study the impact of digitization on children's cognitive, social and identity development. She has published over 200 papers in peer-reviewed journals, many of which on ICT in education, was associate editor of Learning and Individual Differences in 2021 and 2022 and is member of the editorial boards of Learning & Instruction and Educational Psychology. Since 2019, she is also the scientific director of the Dutch Centre for Language Education, which is, among others, responsible for the Dutch PIRLS and PISA studies on reading.

Paraskevi Topali received her Ph.D. degree in Transdisciplinary Research in Education (Summa Cum Laude) from the University of Valladolid (Spain), in 2023. Paraskevi has a background in Pedagogy, holding a BS degree in Primary Education and a MS degree in Information and Communications Technology from the University of Ioannina (Greece). Currently, she is a postdoctoral researcher at the National Educational Lab AI (NOLAI), in the Faculty of Social Sciences from Radboud University (the Netherlands). Her main research interests lay in the area of Technology-Enhanced Learning and include Human-Centred AI, Human-Centred LA, personalized feedback & scaffolding, learning design & learning analytics, MOOCs, K-12. Paraskevi is experienced in organizing international workshops, conferences, and events, both in collocated and online settings (e.g., jTELSS23, 10th Pan-Hellenic and International Conference "ICT in Education"). Additionally, she has an international profile (including professional experience in Greece, Spain, Germany, and the Netherlands), she has been involved in several research projects (with European, international and regional funding) and she participates actively in research societies, such as the European Association of Technology Enhanced Learning (EATEL).

Carla Haelermans is professor of Human Capital, Educational Technology and Inequality at the Research Centre for Education and the Labour Market (ROA) at the School of Business and Economics (SBE), Maastricht University, and member of the scientific team of the Dutch National Education Lab AI at Radboud University. After receiving her PhD on the productivity and efficiency of education (2012), she became assistant professor at Maastricht University, and later associate professor, before becoming a full professor in 2021. She is currently the national coordinator of the Netherlands Cohort Study on Education (Nationaal Cohortonderzoek Onderwijs; NCO) for the Netherlands Initiative for Education Research (NRO; part of the Netherlands Organization for Scientific Research; NWO), leads the research line on Education and Transition to Work at ROA and is a member of the Management Team of ROA. From January 2019 until 1 January 2023, she was the PhD Director, and a member of the Management Team, of the Graduate School of Business and Economics (GSBE) of SBE. Her research focuses on education economics, labour economics, technology in education and inequality and

answers questions such as: How can technology in education effectively be used and what is the role of the teacher and the parents in this? And: Are all types of technology as effective for all types of students and outcomes? Her research has both a fundamental and an applied focus, with a strong societal relevance. In line with the topic of this special issue, she recently received a grant on Youth and Digitization to study the impact of digitization on children's cognitive, social and identity development, together with a large consortium. In her research she has always used a multidisciplinary angle, which is represented by the fact that she published in a large variety of journals in different disciplines. She has published in (top) journals in economics, operational research, sociology, educational sciences and (educational) psychology.