

Future Education and Learning Spaces

ICT & Education in Uncertain Times

Series Editors

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This series focuses on the possible education responses that can be implemented in uncertain times. Uncertainty could happen in times of crises or also in normal situations, where some information or actions are not known, resulting in uncertain educational scenarios. Besides, it also shows how emerging technologies, including Artificial Intelligence, Blockchain, Educational Games and Virtual Reality/Augmented Reality, will reshape the future of education to provide efficient learning/teaching experiences and assessments. Furthermore, the series discusses innovative pedagogical and learning approaches (e.g., the use of open educational practices and peer-to-peer learning) that can be applied in this rapid moving technological era to maintain education, including in uncertain times. Particularly, new instructional methods, such as game-based learning, should be designed based on the integrated technologies to provide effective learning experience, resulting in better learning outcomes. Future education should not solely focus on technology, but also on the applied instructional methods, as well as the human touch to maintain authentic and effective learning experience. The series also discusses how learning spaces can be designed to meet the growing tendency of Open and Distance Education, where thousands of learners can be taken the same course from different cultures, backgrounds and learning needs.


This series aims to establish itself, through the published books/textbooks and research, as a medium to provide guidelines and recommendations for different stakeholders, including policy makers, educational designers, teachers and students on how to enhance both learning and teaching experiences in the future for better learning outcomes, as well as how to maintain education in uncertain times. It also provides one-step ahead towards future education to prepare different stakeholders for the rapid evolution of education, even in times of uncertainty.


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Artificial Intelligence and Human Agency in Education: Volume One

The Nexus Between AI and Human Agency
in Educational Contexts

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Preface

For more than six decades, researchers across a range of disciplines have investigated whether machines can exhibit human-like intelligence. Since the 1950s, when Alan Turing's "Turing Test" first posed the question, "Can machines think?", in his paper "Computing Machinery and Intelligence", the field of Artificial Intelligence (AI) has been at the center of discussions about the capabilities, opportunities, dangers, and ethics of developing advanced computer intelligence. Today, while the field of AI still has a significant way to develop, and much hype surrounds it, the development of large language models (LLM) and natural language processing (NLP) has led to its renewed prominence as a consequence of the widespread availability of applications like ChatGPT, developed by OpenAI in the United States, and latterly DeepSeek from China. This edited volume addresses this complex and exciting context, viewing it through multiple theoretical and empirical lenses in an attempt to help learners, teachers, teacher trainers, and policymakers understand what is at stake.

Unsurprisingly, the AI market has seen a significant increase in growth as a result of these latest popular developments that has embedded the potential of AI into many of our regular everyday activities, from searching on the web to purchasing items online or conversing with via a customer services chatbot. A World Bank report published in 2021 estimated that the global AI market would be worth \$6.4 trillion global by 2025 and that there would be a 14% increase in global GDP by 2030 as a result of AI adoption. The rapid adoption of AI by educational institutions stems from the belief that AI can use its immense processing power and speed to help address societal problems and promote quality education by addressing some of the wicked problems or grand challenges in education. The experimentation of AI in diverse educational systems has revealed the significant potential AI can have on teaching and learning processes to aid personalized teaching and learning and to save educators and learners valuable time. Subsequently, there has been an increase in research to identify and understand practices that could lead to the transformation of the educational landscape.

Although it is true to say that AI has an immense potential to revolutionize education for good, there are inevitably predictions that also consider the harmful effects it

may have on education. This might include increases in plagiarism, reduced opportunities to interact with human teachers and fellow learners, and concerns about privacy, bias, and reduced critical thinking skills. Moreover, as we saw during the recent pandemic, students and teachers without access to AI tools and applications may be left behind, and these technologies may exacerbate digital divides both within and across different countries as well as between the Global North and Global South. The positive and negative impacts of AI on education call on all educators to be involved in a continuous monitoring and validation process with respect to AI systems and to consider its ethical principles and how best to regulate these complex new technologies. Hence, while there has been growth in the importance of the field over the last couple of years, more research and discussions are needed about how humans and machines can co-exist in educational systems in a way that is productive, meaningful and ethically sound. To contribute to this process, the current edition takes a critical look at how AI can augment and enhance human agency in education by leveraging the cognitive, social, and psychological insights that AI research can provide. Research on AI is essential across the cognitive, social and psychological contexts therefore to guide educators and all the various stakeholders involved in education to navigate its potential pitfalls

The rise of AI conversational agents and chatbots has garnered significant global attention over the last couple of years. This growing interest has led educators and researchers to investigate the impact of these AI tools within educational environments and to discover effective strategies for integrating them into teaching and learning practices. While many areas require further exploration, there is an emerging consensus on the profound effects of AI and related technologies on the cognitive, social, and psychological experiences of both educators and students.

This edited book provides unique perspectives on the intersection of AI and education, distinguishing itself from existing literature that has predominantly addressed the social challenges posed by AI—such as climate change and criminality. Instead, it emphasizes the pivotal role of AI in potentially enhancing human agency across various educational contexts. While it includes discussions on workplace learning, it also expands the horizon of AI to encompass broader educational domains, including adult education and lifelong learning.

Additionally, this book is one of the first to consider the cognitive, social, and psychological factors that impact learners' transitions from academic settings into the workforce. Although previous discussions have touched upon innovative technologies in education, they often overlook recent advancements like natural language processing and their implications for learner well-being. Our book bridges these gaps by adopting a multidisciplinary approach to understanding the effects of AI on both educators and learners, with a strong focus on their overall well-being. In conclusion, this collection is an essential resource for those who seek to understand the evolving dynamics of AI in education and its significant implications for human agency.

The edition offers several insights for a diverse audience, from educators and policymakers to researchers and technologists. Teachers and students will also benefit from the novel approaches to instruction and learning suggested in this edited volume.

It is a must-read for anyone interested in understanding the transformative potential of artificial intelligence (AI) in the field of education at the current time.

By exploring the cognitive, social, and psychological implications of AI integration, educators will gain a deeper understanding of how to strike a balance between technological advancements and the preservation of the human element in the learning process. Several chapter authors present a comprehensive analysis of the opportunities and challenges presented by AI in the educational domain that will help policymakers make informed policy decisions and ensure that the integration of AI aligns with the overarching goals of equitable access, inclusive learning, and the development of twenty-first-century skills.

Developers of AI technologies will obtain valuable insights that will guide them in designing and implementing AI systems that seamlessly integrate with the needs and aspirations of learners, educators, and educational institutions. Most importantly, regardless of the background of the reader, this edited book promises to expand your understanding of the transformative potential of AI in education. It is a valuable resource for anyone who seeks to shape the future of learning and unlock the full potential of human agency in the digital age.

As the AI field is attracting more attention, there have been increased scholarly publications on how it affects different sectors of society and daily life. However, most existing books tend to only provide an overview of AI. This has led to increased calls to focus on artificial intelligence in education (AIED) as a sub-field. In assembling the chapters in this volume, the editors were motivated to provide this edition as a state-of-the-art book on AIED by adopting a human agentic perspective. A human agentic perspective enables users of AI tools to set goals and anticipate future implications of AI.

The increased apprehension among students, teachers, parents, educators, policymakers, employers, employees, and many key stakeholders that AI will replace humans as a result of automation calls for users of AI tools or technologies to intentionally take control of AI and not the other way round. As captured in the 2023 Global Education Monitoring (GEM) Report, users of advanced technology, such as AI, need to define the use of technology in their own terms. As humans are shaped by their experiences, interacting with digital technologies will, to some degree, impact the educational, cognitive, social, and psychological processes of teachers, learners, and other users of AI in educational institutions. A user-centered or learner-centered approach is needed to place humans at the center of AI technologies.

Therefore, it is important to look at the implications of AI technologies on human agency across differing contexts involving cognition, social, and psychological processes. In this light, **Volume 1** of this edited book aims to investigate how AI will impact the educational, cognitive, social and psychological processes of teaching and learning in diverse ways across different educational levels. **Volume 1 comprises twelve (12) chapters in total. The authors of Volume 1 were from institutions in Hong Kong, Tunisia, South Africa, India, China, Ghana, Tanzania, Kuwait, Austria, the United States, Zimbabwe, and Pakistan.** The edition advocates for an introspective look at different topics in education, such as the humanization of AI in education, ethical considerations of using AI in education (e.g., issues of privacy, bias,

and safety), technology fatigue and technostress in education, emotional intelligence in AI-based teaching and learning, and the impact of human-computer interaction on cognition, memory, and mental health.

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