

**Special Issue: Exploring the Transformative Impact of AGI on Education: Applications, Integration, and Implications**

AGI (Artificial General Intelligence) refers to artificial intelligence systems capable of thinking, learning, executing, and coordinating complex multi-tasking tasks similar to humans, is a shift in the direction of artificial intelligence towards more comprehensive and human-like intelligence. AGI represents collaboration across various artificial intelligence methods, and the AI agent can assign, coordinate, and monitor tasks to multiple AI entities to complete a complex task just like humans. The best example is the rise of autonomous AI agents. These intelligent entities, resembling independent human actors, have the ability to perceive their environments, make decisions, and take actions autonomously. Unlike traditional AI systems, autonomous agents can set their own goals and devise strategies to achieve them. Possessing sophisticated AI capabilities, these entities acquire knowledge, adjust to new circumstances, and develop themselves over time, mirroring the complex operations of the human brain. As the realm of autonomous agents continues to grow, it becomes essential to grasp their core significance and internal mechanisms to navigate the evolving landscape of artificial intelligence.

As complex interactions are involved in AGI, the primary research focus is on how AGI can coordinate multiple intelligent entities to achieve anticipated task goals. Additionally, emergent behaviors and intelligence have become key points of emphasis in AGI research. These phenomena arise from interactions among multiple AI entities, offering innovative approaches to solving complex problems that are challenging with traditional methods.

In educational contexts, emergent behavior and intelligence can manifest between AGI and learners, reflecting the co-evolution of AGI as both teachers and students over time. The advancement of AGI represents a significant leap in the field of education, AGI will reshape the educational ecosystem, impacting teaching, learning, administration, and their interrelationships significantly. To understand their capabilities, applications, potential impacts, and issues is crucial in the rapidly evolving AI landscape. With meticulous planning and responsible development, AGI can evolve into powerful tools, fostering innovation and driving substantial changes in education.

This special issue aims to provide an opportunity to enhance our understanding of AGI, encompassing their applications, evidence-based practices, and impact on education.

**Suggested Topics:**

We welcome original research articles and theoretical papers that explore the potential of AGI in education. We encourage submissions on (but not limited to) the following topics:

- Explore how AGI agents can facilitate collaborative learning experiences among students, teachers, and the agents themselves, fostering a dynamic educational ecosystem.
- Explore advanced reinforcement learning algorithms to enhance the decision-making capabilities of AGI, ensuring effective adaptation to educational scenarios.

- Examine strategies for improving coordination and communication among multiple autonomous agents to achieve collective goals and tasks in education.
- Develop models that enable AGI to mimic human-like cognitive processes, enhancing their ability to understand and respond to dynamic situations in teaching and learning.
- Investigate methods to make the educational decision-making processes of AGI more transparent and interpretable, addressing concerns related to accountability and trust.
- Develop and refine metrics for evaluating the effectiveness of AGI in supporting teaching and learning, considering both quantitative and qualitative measures.
- Investigate how the use of AGI influences cognitive development in learners, examining factors such as critical thinking, problem-solving skills, and creativity.
- Explore strategies for training and supporting educators in integrating AGI into their teaching practices, ensuring effective collaboration between teachers and intelligent agents.
- Examine different models of collaboration between humans and AGI in educational settings, identifying optimal approaches for enhancing the learning experience.
- Investigate security and privacy challenges associated with the deployment of AGI in educational contexts, proposing robust solutions to protect sensitive information.
- Showcase recent advancements in educational technology driven by AGI.
- Investigate how emergent knowledge is transferred and co-evolves between AGI and learners, developing methodologies to evaluate the effectiveness of this collaborative knowledge creation process.
- Explore the co-evolutionary dynamics between AGI and human learners, developing models and metrics to measure the reciprocal impact on both entities over time.
- Develop quantitative metrics to measure and evaluate emergent behaviors in AGI within educational frameworks, providing a systematic approach for analysis.
- Investigate how adaptive learning environments, facilitated by AGI, generate emergent patterns in human-machine interaction and how these patterns contribute to the learning process.
- Examine the co-evolutionary relationship between AGI and human teachers, focusing on how instructional strategies evolve through continuous interaction and feedback.
- Analyze the emergence of knowledge in collaborative learning spaces where AGI collaborates with human learners, exploring the co-evolutionary processes that lead to shared understanding.
- Investigate the ethical implications of emergent behaviors in AGI, exploring how these behaviors impact the learning experience and identifying ethical considerations in their design and deployment.
- Conduct studies to assess the impact of the co-evolutionary relationship between AGI and students on academic performance, satisfaction, and overall learning outcomes.
- Explore the transferability of emergent knowledge generated by AGI to real-world problem-solving scenarios, assessing the practical applicability of the knowledge co-created in educational contexts.

Please note that the IEEE Transactions on Learning Technologies emphasizes the intersection of technology with learning and teaching, rather than focusing solely on technology or reporting solely

about educational trials. We encourage authors to submit evidence-based articles on the integration of AGI in educational contexts, addressing applications, challenges, and issues. Additionally, we suggest exploring implications for both practice and research.

### **Submission and Review Process**

Full manuscripts should follow the writing style guidelines of IEEE Transactions on Learning Technologies, and submitted via the IEEE TLT AUTHOR PORTAL SUBMISSION SITE.

We would ask authors to kindly serve as reviewers of the submissions. Reviewers will also be recruited from the pool of TLT reviewers. Authors are strongly recommended to nominate 3 reviewers at the time of submission.

### **The Important Dates:**

- Full submission due: 5/31/2024 (extension can be granted upon request)
- Final paper due: 09/15/2024 (extension can be granted upon request)
- Final decision to authors: 10/31/2024
- Early access: immediate

Please contact [tlt-agi2024@ieee.org](mailto:tlt-agi2024@ieee.org) with any questions, comments, or concerns.

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