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The Future of Teaching: Artificial Intelligence (AI) And Artificial General Intelligence (AGI) For Smarter, Adaptive, and Data-Driven Educator Training

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ABSTRACT

The fast evolution of Artificial Intelligence (AI) and the developing Artificial General Intelligence (AGI) capabilities transform how education operates, particularly through its effect on teacher training. AI-based systems provide adaptable learning spaces, and they offer both real-time assessment capabilities and data-driven educational method improvements. With its capability for human-level cognitive operations, AGI creates conditions to transform educator skill advancement processes. The article examines AI and AGI integration within teacher education programs by discussing their practical uses and advantages, together with the encountered challenges and ethical dilemmas. The analysis combines evaluative and creative AI tools like Gradescope and ChatGPT, and Carnegie Learning, with developing capabilities in AGI. The article uses detailed analysis, together with tables, along pictorial representations to show the necessity of achieving optimal teacher training through AI-human balanced cooperation. The research finds that AI brings efficiency benefits, but AGI's prospective function needs strict governance together with educational alignment, to maintain ethical, unbiased teacher education.

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1. INTRODUCTION

Today, Technology has moulded its way into education in a tremendous manner, and Artificial Intelligence (AI) has significantly contributed towards the changes in teaching and learning methods (Al Husaeni *et al*., 2024; Solihat *et al*., 2024; Nurhasanah & Nugraha, 2024). Personal and tailored instruction, data-driven insight, and automated feedback systems are all possible because of the existence of AI-driven adaptive learning platforms. On a more advanced scale, Artificial General Intelligence (AGI), artificially intelligent and general intelligent machines that can mimic human intelligence in terms of achieving various tasks, will be able to perform dynamic problem-solving, real-time assessment, and intelligent tutoring systems like nothing we can ever imagine (Goertzel, 2020; Geetha, 2025; Donmez, 2024).

This paper examines the ways AI and AGI help develop educator training by enhancing intelligence and adaptability, as well as processing educational data. Through utilizing AI-powered systems like Gradescope and ChatGPT combined with Turnitin, teachers can enhance their teaching procedures with potential improvements coming from whole-systems based on AGI (Nguyen *et al*., 2022). The article delivers an extensive investigation about AI and AGI applications in teacher training through visuals, along with tables, along real teacher training scenarios.

2. METHODS

This study is a literature review, in which data was obtained by taking and analyzing papers from articles published in international journals. This study also made a conclusion based on the analyzed papers.

3. RESULTS AND DISCUSSION

AI-driven platforms enhance teacher training through automated assessment, adaptive learning pathways, and intelligent tutoring. **Table 1** and **Figure 1** present key AI tools and their impact on educator training. The key components of the AI-driven educator training model include:

(i) AI-Enabled Learning Analytics: AI collects and processes data from various sources, such as student performance, engagement metrics, and feedback, to generate insights that help teachers refine instructional strategies.
(ii) Automated Assessment Systems: Tools like Gradescope and Turnitin evaluate assignments, detect plagiarism, and provide real-time feedback, reducing the grading workload on educators.
(iii) Adaptive Learning Platforms: AI-driven tools such as Carnegie Learning analyze teacher performance and suggest personalized professional development resources tailored to individual educator needs.
(iv) Virtual Classrooms with AI Support: AI-driven simulations and virtual classroom environments allow teachers to engage with AI-generated student avatars to practice classroom management, pedagogical strategies, and differentiated instruction.
(v) AGI-Powered Decision Support: Advanced AGI models analyze complex educational data to provide predictive analytics on student success, curriculum effectiveness, and personalized teaching improvements.

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(vi) Real-Time Feedback Mechanisms: AI-based systems offer immediate feedback on lesson delivery, engagement techniques, and communication effectiveness, ensuring continuous professional growth for educators (Hayat *et al*., 2024).

Table 1. AI tools and their impacts for education.

AI Tool	Functionality	Impact on Teacher Education
Gradescope	Automated grading and feedback	Enhances efficiency and consistency
ChatGPT	AI-powered content generation and personalized tutoring	Supports curriculum design and instruction
Carnegie Learning	Adaptive learning platform for educators	Provides data-driven instructional insights
Turnitin	Plagiarism detection and writing analysis	Promotes academic integrity and originality

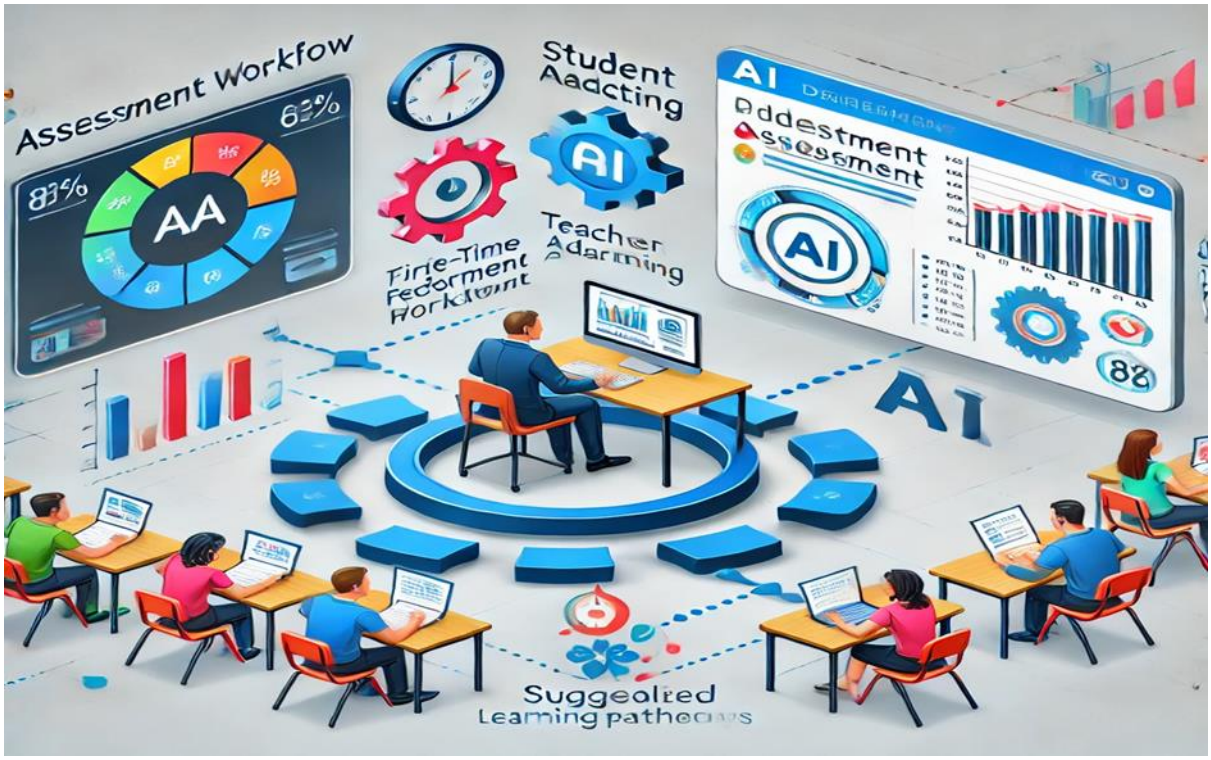

Figure 1. AGI's potential in teacher training.

Unlike AI, which is task-specific, AGI possesses the capability to process complex reasoning, problem-solving, and decision-making across multiple domains. In teacher education, AGI could be a transformative force, offering dynamic, interactive, and highly personalized training experiences that adapt to the needs of educators in real time.

Key potential applications of AGI in educator training:

(i) Simulated Classrooms: AGI-driven virtual environments can simulate real-world classroom scenarios with diverse student behaviours. These simulations would allow teachers to practice classroom management, lesson delivery, and engagement strategies in a risk-free setting.

(ii) Autonomous Pedagogical Strategies: AGI could analyse large datasets of teaching methodologies, student outcomes, and engagement patterns to provide customized feedback and suggest innovative instructional strategies.

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(iii) Decision-Making Support: By processing vast amounts of educational data, AGI can generate predictive analytics reports to help educators refine their curriculum, identify at-risk students, and enhance overall instructional effectiveness.
(iv) Real-Time Adaptive Training: Unlike conventional AI-powered systems, AGI could continuously learn and adapt its training models, responding to educators' strengths and weaknesses dynamically. This allows for a more personalized professional development experience.
(v) Advanced Assessment and Feedback: AGI could evaluate teachers' instructional methods using multimodal data sources such as video recordings, student feedback, and performance analytics, providing a holistic assessment of teaching effectiveness.
(vi) Ethical Decision Guidance: AGI-driven systems could support educators by offering ethical considerations for handling sensitive classroom situations, ensuring that decisions align with best practices and educational policies.

By integrating AGI into teacher training, the education sector can move beyond standardized professional development programs toward truly intelligent, responsive, and individualized training experiences that empower educators to excel in a rapidly evolving learning landscape. Unlike AI, which is task-specific, AGI can process complex reasoning, problem-solving, and decision-making across multiple domains. In teacher education, AGI could simulate classroom environments, offer dynamic scenario-based training, and provide deep analytical insights into pedagogical methods.

Key potential applications of AGI in educator training:

(i) Simulated Classrooms: Real-time interaction with virtual students to practice classroom management.
(ii) Autonomous Pedagogical Strategies: Personalized feedback on lesson delivery and student engagement.
(iii) Decision-Making Support: Analytical reports on curriculum effectiveness and student performance trends.

The integration of AI and AGI in teacher training presents numerous advantages, including efficiency, personalized learning experiences, and enhanced pedagogical decision-making. However, challenges such as ethical considerations, data privacy, and the risk of over-reliance on technology must be addressed (Zawacki-Richter *et al*., 2019).

Detailed Benefits of AI and AGI in Teacher Training are in the following:

(i) Efficiency & Automation: AI automates routine tasks like grading and assessment, allowing educators to focus on pedagogical improvements and student engagement. Platforms such as Gradescope and Turnitin streamline the grading process, ensuring consistency and reducing bias.
(ii) Adaptive Learning Paths: AI-powered adaptive learning systems tailor professional development programs to teachers' skill levels, providing customized resources to enhance their competencies. AI tools like Carnegie Learning analyze teacher performance and suggest personalized learning modules.
(iii) Data-Driven Decision Making: AI collects and processes large volumes of educational data, generating insights into curriculum effectiveness, teacher performance, and student outcomes. This allows institutions to refine instructional methods based on real-time analytics.
(iv) Simulation-Based Training: AGI-powered virtual classrooms can simulate diverse student behaviours and classroom scenarios, enabling teachers to practice and improve their classroom management and instructional skills in a controlled setting.

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(v) Enhanced Pedagogical Strategies: AI and AGI analyze large datasets of teaching methodologies to suggest best practices, innovative instructional approaches, and alternative lesson plans based on empirical evidence.

Challenges and Ethical Considerations are in the following:

(i) Bias in AI Algorithms: AI models may inherit biases from training data, leading to disparities in assessment and recommendations. It is essential to continuously monitor and refine AI algorithms to mitigate biases and ensure fair evaluations.

(ii) Privacy and Data Security: AI-driven education platforms collect vast amounts of sensitive data, raising concerns about data security and ethical usage. Institutions must implement strict data governance policies to protect educators' and students' privacy.

(iii) Human-AI Collaboration: AI and AGI should serve as assistive tools rather than replacements for human educators. Teacher training programs must emphasize the importance of human oversight in AI-powered decision-making processes.

(iv) Over-Reliance on Technology: Excessive dependence on AI tools may lead to a decline in critical thinking and problem-solving skills among educators. Balancing AI integration with human expertise is necessary for sustainable professional development.

To better visualize AI and AGI's role in educator training, **Table 2** highlights key functions, benefits, and implementation challenges.

Table 2. Representation of AI & AGI integration in teacher training.

AI/AGI Function	Application in Teacher Training	Benefits	Challenges
AI-Powered Learning Analytics	Tracks teacher performance, student engagement, and learning outcomes	Data-driven insights for instructional improvement	Data privacy concerns and ethical considerations
Automated Assessment Systems	AI-assisted grading and plagiarism detection	Reduces workload and ensures assessment consistency	Risk of algorithmic bias and over-reliance
AI/AGI Function	**Application in Teacher Training**	**Benefits**	**Challenges**
Adaptive Learning Platforms	Personalized training modules for teachers	Enhances learning experiences and professional growth	Requires continuous model refinement
AGI-Powered Simulated Training	Virtual classrooms for real-world scenario practice	Safe environment for pedagogical skill development	High computational requirements and costs
AI-Generated Lesson Feedback	Evaluates teaching strategies in real-time	Improves lesson effectiveness and engagement	Need for human oversight and validation

The integration of AI and AGI in teacher training presents numerous advantages, including efficiency, personalized learning experiences, and enhanced pedagogical decision-making. However, challenges such as ethical considerations, data privacy, and the risk of over-reliance on technology must be addressed (Zawacki-Richter *et al*., 2019).

4. CONCLUSION

AI and AGI are redefining teacher training by fostering adaptive, data-driven, and intelligent learning experiences. While AI tools like Gradescope and ChatGPT already enhance assessment and instruction, AGI's future role promises greater advancements in pedagogical adaptability and decision-making. However, ethical considerations, bias mitigation, and

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responsible AI deployment must be prioritized to ensure equitable and effective educator training. The future of teaching will likely be a collaborative space where AI augments human intelligence, providing more efficient and innovative educational solutions.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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