

ACCESS TO ARTIFICIAL INTELLIGENCE IN ACADEMIC LIBRARIES: TEACHING, LEARNING AND RESEARCH (TLR)

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ABSTRACT

This paper deals with the Access to Artificial Intelligence Tools in Teaching, Learning and Research (TLR), Artificial Intelligence Applications in Education and Libraries, Emerging trends in AI are transforming both education and libraries, Dr.S R Ranganathan's Five Laws of Library science in AI Age, offering new tools and approaches for learning and information management. AI uses and Teaching, Learning and Research purposes. AI is being integrated into educational systems to personalize learning, automate tasks, and provide intelligent tutoring. In libraries, AI is used for tasks like information retrieval, cataloging, and user engagement, leading to more efficient and personalized services

Keywords: Access, Artificial intelligence, Teaching, Learning, Research, Ai-Powered, US Dept. of Education, Education, Libraries, UNESCO.

“Artificial Intelligence for all” must be that everyone can take advantage of the technological revolution under way and access its fruits, notably in terms of innovation and knowledge. -UNESCO

Introduction to Artificial Intelligence

Artificial Intelligence (AI) in education is transforming learning by personalizing education, automating tasks, and providing accessible learning experiences, ultimately aiming to enhance student engagement and improve learning outcomes. Artificial intelligence is enabling the development of invaluable services and taking part in more and more aspects of our lives. Built from data, hardware and connectivity, AI allows machines to mimic human intelligence such as perception, problem-solving, linguistic interaction or creativity. These technologies contribute to achieving the 2030 Agenda for Sustainable Development. However, these rapid changes raise major issues. UNESCO addresses these matters, from ethics of AI, AI in education, gender equality, to capacity building for governments and judiciary. Artificial Intelligence (AI) has the potential to address some of the biggest challenges in education today, innovate teaching and learning practices, and accelerate progress towards Sustainable Development Goals.

UNESCO's mandate calls inherently for a human-centered approach to AI. It aims to shift the conversation to include AI's role in addressing current inequalities regarding access to knowledge, research and the diversity of cultural expressions and to ensure AI does not widen the technological divides within and between countries. The promise of *“Artificial Intelligence for all”* must be that everyone can take advantage of the technological revolution under way and access its fruits, notably in terms of innovation and knowledge. Within the *framework of the Beijing Consensus*, UNESCO developed *Artificial Intelligence and Education: Guidance for Policy-makers* to foster the readiness of education policy-makers in artificial intelligence.. UNESCO also published AI competency frameworks for students and teachers to guide countries in supporting students and teachers to understand the potential as well as risks of AI.

Generative AI can be seen as a form of creative expression, where the machine collaborates with the human to produce novel and valuable outcomes. Generative AI can also be used to augment and enhance human creativity, by providing suggestions, feedback, and alternatives. AI isn't one single technology: it's a toolbox overflowing with possibilities.

- Machine Learning: Systems that "learn" by uncovering patterns in massive datasets.
- Deep Learning: Advanced techniques, mimicking our brains, for tasks like image and voice recognition.
- Natural Language Processing: Enabling computers to understand and communicate like humans do.
- Generative AI: The creative force producing and generating amazing text, images, and even code automatically with simple prompts.

“I strongly believe in the need for stakeholders to understand the cyclical effects of AI and education.

By understanding how different activities accrue, we have the ability to support virtuous cycles.

Otherwise, we will likely allow vicious cycles to perpetuate.” —Lydia Liu

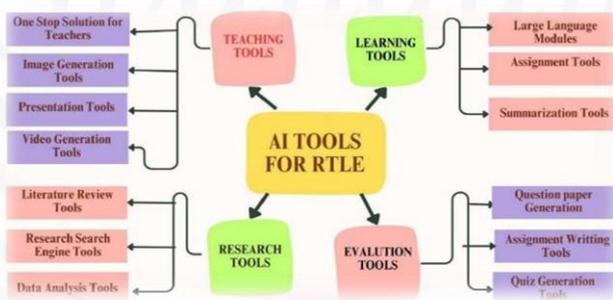
The U.S. Department of Education is committed to supporting the use of technology to improve teaching and learning and to support innovation throughout educational systems. This report addresses the clear need for sharing knowledge and developing policies for “Artificial Intelligence,” a rapidly advancing class of foundational capabilities which are increasingly embedded in all types of educational technology systems and are also available to the public. We will consider “educational technology” (edtech) to include both (a) technologies specifically designed for educational use, as well as (b) general technologies that are widely used in educational settings. Recommendations in this report seek to engage teachers, educational leaders, policy makers, researchers, and educational technology innovators and providers as they work together on pressing policy issues that arise as Artificial Intelligence (AI) is used in education.

Dr. S R Ranganathan’s Five Laws of Library Science in AI Age	Key AI Features
1. Books for Use: Artificial Intelligence for Use	Discovery platforms, chatbots, open-access AI interfaces
2. Every Reader his/her Book: Every Patron his/her AI Tool	Personalized recommendation engines, user profiling ML
3. Every Book Its Reader: Every Artificial Intelligence for Patron	Metadata matchmaking algorithms, targeted notifications
4. Save the Time of the Reader: Save The Time of The Patron	Automated cataloging (NLP/ML), predictive analytics, RFID integration
5. Library is a Growing Organism: Artificial Intelligence is a Growing Systems	Cloud-based retraining, modular AI updates, VR/AR integration

Rising Interest in AI in Education: Today, many priorities for improvements to teaching and learning are unmet. Educators seek technology-enhanced approaches addressing these priorities that would be safe, effective, and scalable. Naturally, educators wonder if the rapid advances in technology in everyday lives could help. Like all of us, educators use AI-powered services in their everyday lives, such as voice assistants in their homes; tools that can correct grammar, complete sentences, and write essays; and automated trip planning on their phones. Many educators are actively exploring AI tools as they are newly released to the public. Educators see opportunities to use AI-powered capabilities like speech recognition to increase the support available to students with disabilities, multilingual learners, and others who could benefit from greater adaptively and personalization in digital tools for learning. They are exploring how AI can enable writing or improving lessons, as well as their process for finding, choosing, and adapting material for use in their lessons.

AI Tools in Teaching, Learning and Research

Where, a prompt is a concise textual input that the Generative AI Bot uses to generate the output based on its functionality.



Wide range of AI tools tailored for education sector:

- Generative AI as a game changer: Generative AI revolutionizes education by personalizing content, fostering collaboration, and promoting creativity.
- AI-powered Assistants: These intelligent companions offer on demand support, answering student questions, providing guidance, and even acting as a practice partner for language learning.
- Adaptive Learning Platforms: These AI-driven platforms leverage student data to personalize learning paths, offering targeted practice exercises, and adapting to individual pace and understanding.

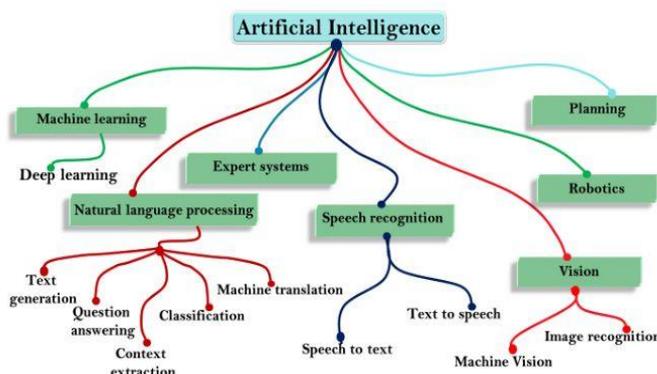
Objectives of Paper:

- To know the access of Artificial Intelligence Academic in Education Libraries
- To identify the AI in Teaching, Learning and Research.
- To Study the future of AI use in Teaching, Learning and Research.

Artificial Intelligence in Teaching

“AI in education can only grow at the speed of trust.” —Dr. Dale Allen

Adapting teaching practices in response to AI: Natural language AI chatbots such as ChatGPT use vast amounts of text data to predict words or phrases in a given context. They can be used to mimic natural human language and to aid a wide variety of language-related tasks in much more sophisticated ways than previously possible. Other emerging AI tools, also trained on large datasets, focus on producing computer code and images in response to user prompts. At the Center for Teaching and Learning (CTL), we have heard a lot of interest, concerns, and questions from the campus community.



AI Tools in Teaching-Tools to Create Presentations

Launch a transformative journey in your classroom by harnessing the power of AI to revolutionize your teaching methods, empower students, and delve into a realm of insights through the infusion of creativity in your teaching and learning practices. Prepare to create visually engaging lessons, support student-led projects, and gather actionable data to enhance your teaching using cutting-edge AI tools like Gamma AI, Tome, Beautiful.ai, Slides.ai, SlidesGo, and Canva. AI is the science and engineering of creating machines and systems that can perform tasks that normally require human intelligence, such as understanding language, recognizing images, solving problems, and learning from data. AI has been advancing rapidly in recent years, thanks to the availability of large amounts of data, powerful computing resources, and innovative algorithms. AI has the potential to transform various domains of human activity, such as health, education, entertainment, business, and security. One of the most exciting and promising areas of AI is Generative AI, which is the ability to create *new and original content, such as text, images, music, code, and more, based on some input or guidance.*

Gamma

It is an AI-powered tool that allows you to quickly create beautiful and interactive presentations, reports, and web pages. Think of it as a streamlined alternative to traditional slide-based presentations, designed to make presenting information engaging and clear. It offers an array of tools and features to transform presentations into visually engaging experiences, ensuring maximum impact and effective communication.

AI Revolutionizing Education: From Classrooms to Research Labs

- Teaching: PowerPoint generation, lesson customization, and intelligent learning resources.
- Learning: Personalized learning paths, immediate feedback, and realtime support for diverse learners.
- Evaluation: Automated grading, insightful analytics, and identifying areas for improvement.
- Research and Analysis: Uncovering hidden patterns in educational data, and predicting trends.
- Mining vast datasets: Imagine AI quickly identifying trends, analysing research papers, and suggesting relevant resources, accelerating discovery, and saving researchers' valuable time.
- Automated citation checking and plagiarism detection: Ensure the integrity of research with AI-powered tools that streamline these tedious tasks.
- Personalized writing assistants: Enhance research papers with AI tools that provide grammar suggestions, improve clarity, and ensure academic style consistency. The integration of AI into education represents a significant step forward, demonstrating educators' commitment to innovation. Let's work together to leverage the power of AI to create a future where educators are empowered, learners are deeply engaged, and cultivates a lifelong passion for learning.

Why Education Needs AI Integration

Education is a fundamental human right and a key driving force for social and economic development. However, education also faces many challenges: such as access, quality, equity, relevance, innovation, identifying diverse student needs, rapidly shifting information landscapes, and a pressing demand for 21st-century skills. AI is poised to reshape the way we teach, learn, and conduct research.

AI isn't about robots seizing control of classrooms; it's about sophisticated algorithms and techniques that emulate human intelligence. AI can be seen as an extensive digital toolkit that enables:

- **Personalize Instruction:** Imagine an AI tutor adapting to a student's learning pace, tailor learning paths to individual needs, identify knowledge gaps, and provide targeted feedback to each learner, accelerating progress towards learning goals.
- **Automate Tasks:** Streamline lesson planning, grade assessments, and generate engaging learning content.
- **Analyses Data:** Uncover patterns, predict trends, and reveal valuable insights in educational data.
- **Ignites Creativity:** Generate original text, images, code, and other content, unleashing student ingenuity.
Source: <https://gamma.app>
- **Tome:** It is a website that offers an artificial intelligence (AI) tool for creating personalized teaching materials for various subjects and topics. Use the Tome application to plan your lessons, create exercises and worksheets, and generate quizzes and tests with the help of AI. Also use the Tome app to access and modify pre-made content from a library of over 500 exercises and worksheets.(Source: <https://tome.app/>)
- **Beautiful.ai:** Beautiful.ai is a cloud-based presentation platform that leverages artificial intelligence(AI) to simplify and streamline the presentation creation process. It aims to help users create visually appealing and professional-looking presentations quickly and easily.

AI enhances the teaching process by:

- **Personalizing Instruction:** Tools like Knewton or Smart Sparrow adapt content to individual student needs.
- **Automated Grading:** Tools such as Gradescope use AI to evaluate assignments and quizzes.
- **Virtual Teaching Assistants:** Chatbots like Jill Watson at Georgia Tech assist in answering student queries 24/7.
- **Content Creation:** AI tools such as Quizlet or ChatGPT help educators generate quizzes, summaries, and explanations.

AI In Teaching Presentation Tools

- **Decktopus:** <https://www.decktopus.com/>
- **ZohoShow:** <https://www.zoho.com/show/>
- **Visme:** <https://www.visme.co/>

Artificial Intelligence in Learning

AI empowers learners by:

- **Adaptive Learning Platforms:** Duolingo, Coursera, and Khan Academy use AI to tailor learning paths.
- **Intelligent Tutoring Systems:** AI systems like Socratic or Carnegie Learning guide students step-by-step.
- **Language and Skill Learning:** Apps like ELSA Speak and LinkedIn Learning employ AI for real-time feedback.
- **Gamification and Engagement:** AI helps create interactive learning environments to boost motivation.

Artificial Intelligence in Learning LLM Tools

- **Anthropic Claude:** <https://www.anthropic.com/claude>
- **Perplexity :** <https://www.perplexity.ai/>
- **Talkpal:** <https://talkpal.ai/>

Text – to – Video Generation Tools

- **Kapwing:** <https://www.kapwing.com/ai/text-to-video>
- **Sora:** <https://openai.com/sora>
- **Lumen5 :** <https://lumen5.com/>

- Animaker: <https://www.animaker.com/>
- Renderforest: <https://www.renderforest.com/>

Text – to – Image Generation Tools

- PhotoSonic: <https://photosonic.pro/>
- Jasper: <https://www.jasper.ai/art>
- DaVinci : <https://davinci.ai/>
- Gencraft: <https://gencraft.com/>
- Wepik: <https://wepik.com/ai>

Artificial Intelligence in Research

AI is transforming the research landscape through:

- Literature Review Automation: Tools like Iris.ai and Connected Papers summarize and visualize related work.
- Plagiarism Detection: AI-based tools like Turnitin ensure research originality.
- Data Analysis and Prediction: AI tools such as SPSS Modeler, RapidMiner, and Google AutoML help in processing large datasets.
- Academic Writing Support: Tools like Grammarly, Writefull, and ChatGPT assist in language refinement and content generation.

Artificial Intelligence in Research Analysis Tools:

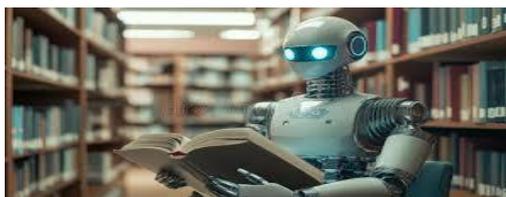
- Elicit: <https://elicit.com/>
- OpenRead: <https://www.openread.academy/>
- Semantic Scholar: <https://www.semanticscholar.org/>
- Jenni: <https://jenni.ai/>
- ZeroGPT: <https://www.zerogpt.com/>
- Litmaps: <https://www.litmaps.com/>
- Copyleaks: <https://copyleaks.com/>
- ChatDOC: <https://chatdoc.com/>
- SpinBot: <https://spinbot.com/>

Artificial Intelligence in Evaluation:

- Forms.app: <https://forms.app/>
- BlockSurvey: <https://blocksurvey.io/>
- Zonka: <https://www.zonkafeedback.com/>
- QuestionPro: <https://www.questionpro.com/in/>

Advantages of AI in Improving Academic Support Teaching, Learning and Research :

- Personalized Learning : AI-powered tools can analyze student data to identify individual learning needs and provide tailored support, including virtual tutoring, customized content, and adaptive learning platforms.
- Automated Tasks : AI can automate repetitive tasks like grading, lesson planning, and administrative work, freeing up educators' time for more focused teaching and student interaction.
- Enhanced Research : AI can assist with literature reviews, data analysis, and research writing, enabling more efficient and in-depth research.
- Accessibility : AI tools can be integrated with assistive technologies to support students with disabilities, providing personalized learning experiences.
- Increased Engagement: AI-powered gamification features can make learning more engaging and motivating for students. Increases accessibility and inclusivity, Enhances efficiency and productivity. Supports lifelong and self-paced learning. Reduces the cognitive load for educators and researchers.



AI in Teaching, Learning and Research

Ethics of Artificial Intelligence:

The rapid rise in artificial intelligence (AI) has created many opportunities globally. However, these rapid changes also raise profound ethical concerns. These arise from the potential AI systems have to embed biases, contribute to climate degradation, threaten human rights and more. Such risks associated with AI have already begun to compound on top of existing inequalities, resulting in further harm to already marginalized groups. To correct this, the Recommendation on the Ethics of Artificial Intelligence was adopted by acclamation by 193 Member States in 2021. Global AI Ethics and Governance Observatory

Emerging Trends in AI in TLR:

- **Text and data mining:** The ability of AI to mine data and write language is revolutionizing research support. Libraries can use AI technologies to analyze large datasets more quickly and thoroughly. Accelerated trend analysis, data extraction, and literature reviews help researchers and greatly improve the productivity of the research process.
- **AI-assisted information literacy programs:** Libraries may use AI to create interactive and adaptable information literacy programs since they are centers of learning. These customized learning-style-based programs offer users one-on-one assistance in navigating the information landscape. AI-powered lessons help users develop their critical thinking abilities so they may successfully traverse the complexity of information in the digital era.
 - **Digital Divide:** Not all institutions or learners have equal access to AI tools.
 - **Ethical Concerns:** Issues related to data privacy, algorithmic bias, and plagiarism.
 - **Training Needs:** Faculty and students require proper training to effectively use AI tools.
 - **Dependency Risks:** Overreliance on AI may reduce critical thinking and analytical skills.

Conclusion

Artificial Intelligence is a powerful enabler in the education sector teaching, learning and research ecosystem. Ensuring equitable access, digital literacy, and ethical usage is essential for maximizing its benefits in Teaching, Learning, and Research (TLR). Use of AI systems and tools must be safe and effective for students. They must include algorithmic discrimination protections, protect data privacy, provide notice and explanation, and provide a recourse to humans when problems arise. The people most affected by the use of AI in education must be part of the development of the AI model, system, or tool, even if this slows the pace of adoption.

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