

AI in Education in South Africa

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Agenda

- AI Basics
- Global Context
- AI Tools
- Implementation
- Stakeholder Voices
- Cambridge's Approach

AI Basics

What is Artificial Intelligence?

AI refers to computer programs that simulate human intelligence by:

- Recognizing patterns in data and behaviour
- Making predictions based on analysed information
- Generating new content from learned patterns

Understanding AI is crucial for educators to:

- Develop responsible AI usage policies
- Ensure equitable access across school systems
- Design effective AI integration strategies

The Evolution of AI

1950s: AI emerges as an interdisciplinary field, combining computer science with mathematics, engineering and psychology to create intelligent systems

1980s: Machine Learning revolutionizes AI by enabling computers to improve through data processing, shifting from rigid programming to learning from examples

2010s: Deep Learning transforms the field by using brain-inspired neural networks, allowing machines to learn complex patterns and representations

2020s: Large Language Models represent a breakthrough in AI, enabling sophisticated language understanding and generation at unprecedented scales

Generative AI

Advanced AI systems that can create various content forms:

- Text generation and writing
- Image and visual content creation
- Video and multimedia production
- Musical composition

Critical Concerns for Education:

- Limited transparency in how models make decisions
- Potential for bias in outputs and training data
- Risk of spreading misinformation
- Student overreliance on AI tools

AI Literacy

AI Literacy is the fourth literacy

To be AI literate you need:

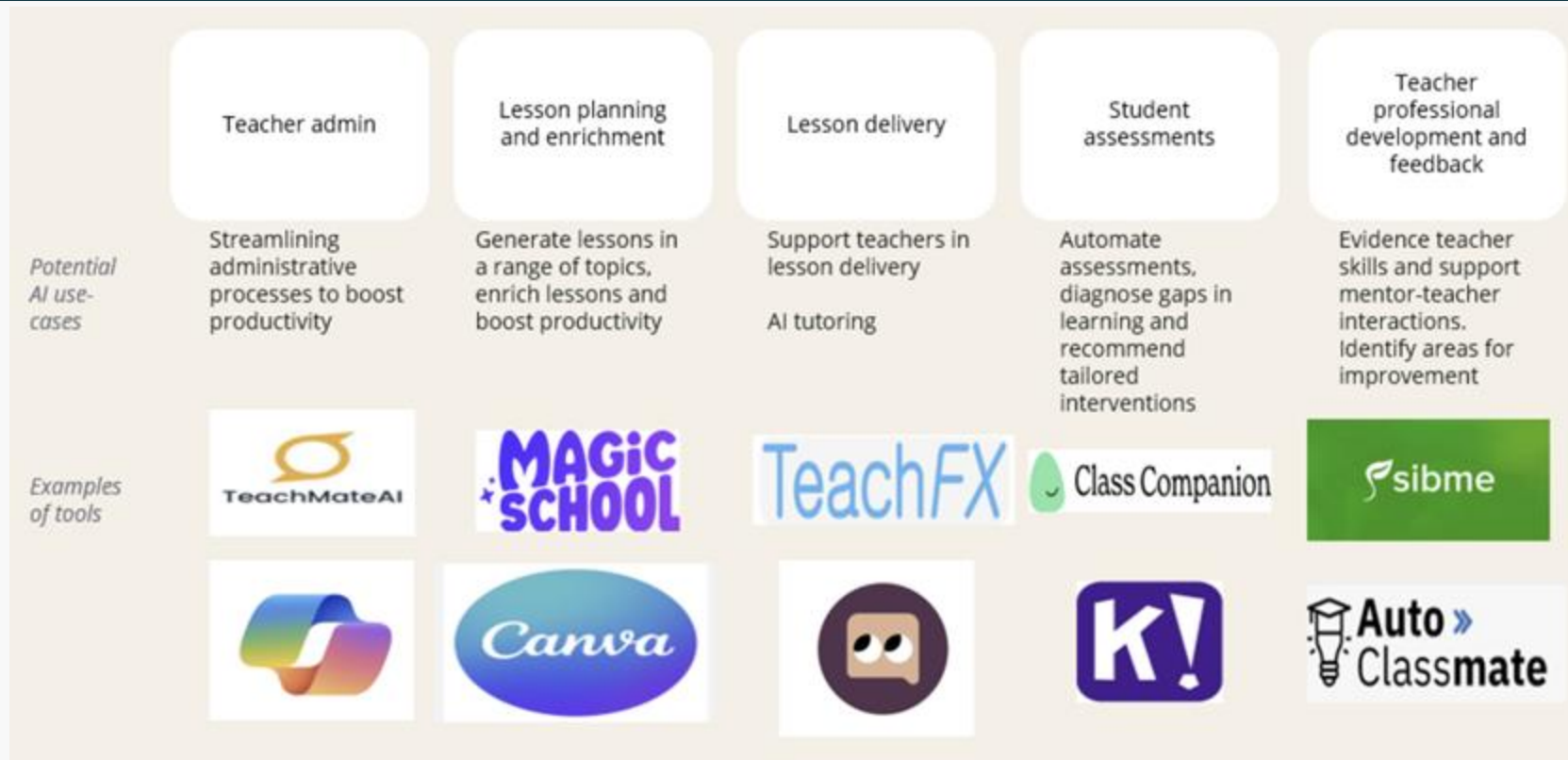
- Technical Understanding: Grasp the fundamentals of how AI systems function and make decisions
- Responsible Usage: Develop skills to use AI tools ethically and effectively in appropriate contexts
- Impact Awareness: Recognize both societal and ethical implications of AI implementation
- Risk Management: Identify potential benefits and risks, while understanding strategies for risk mitigation

Common Misconceptions about AI

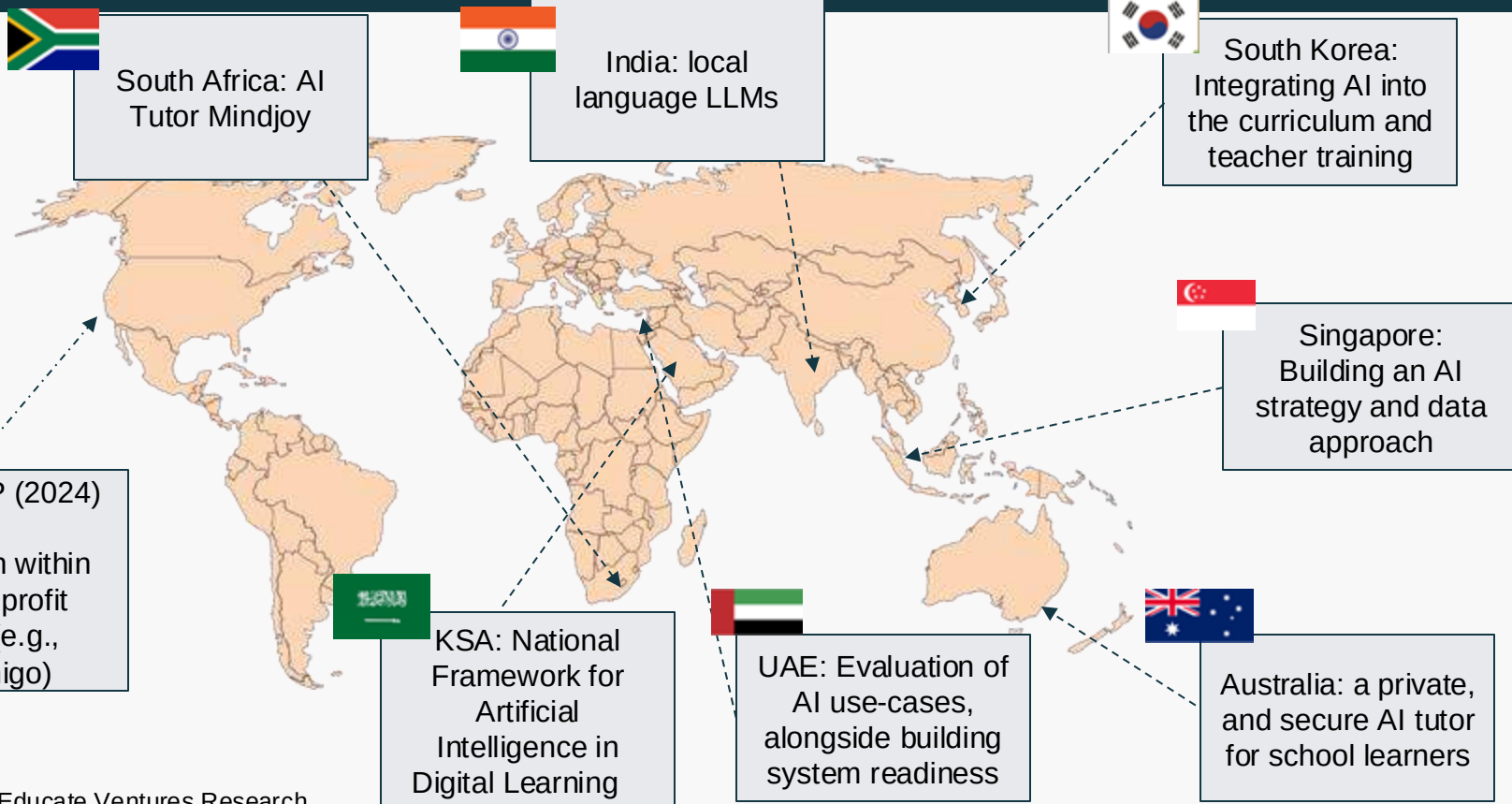
Misconception	Explanation
AI can think in the same ways people do.	Gen AI simulates understanding by repeating patterns in data rather than comprehending content with intent or awareness. This approach can lead to seemingly credible errors, often called “hallucinations,” highlighting the need for humans in decision-making roles.
All AI is alike.	There is a wide range of AI technologies with various capabilities. Each has its strengths and limitations and is suited to different tasks.
AI decisions are unbiased.	AI systems can perpetuate or amplify biases in their training data. Bias in AI systems can also come from the design, development, or testing process.

Global Context

Examples of AI Use Cases



Global Education Snapshot



Some of the Countries with Guidance



Australia: Framework for Generative Artificial Intelligence (AI) in Schools ([link](#))



Japan: Interim guidelines for the use of generative AI at the primary and secondary education level ([link](#))



New Zealand: Generative AI Guidance ([link](#))



South Korea: Education policy direction and key tasks in the artificial intelligence era ([link](#))



United Kingdom: Generative artificial intelligence (AI) in education ([link](#))



Artificial Intelligence and the Future of Teaching and Learning ([link](#))

AI Across Schooling System

Curriculum: Policy development, resource allocation, guidelines

School Leadership: Implementation strategies, staff development, infrastructure planning

Teachers: AI-enhanced pedagogy, tool proficiency, ethical use in classrooms

Learners: AI literacy, critical thinking skills, responsible use of AI tools

Parents: Understanding AI's role in education, supporting children's AI literacy

53% feel
schools aren't
preparing
students

UNESCO AI Competency Framework

Launched during Digital Learning Week, in September 2024.

- The **AI competency framework for teachers** will define the knowledge, skills and attitudes that teachers should possess to understand the roles of AI in education and utilize AI in their teaching practices in an ethical and effective manner.
- The **AI competency framework for school students** will articulate the knowledge, skills and attitudes students should acquire to understand and actively engage with AI in a safe and meaningful manner in education and beyond.

5 Core Dimensions

Human-Centred Mindset

Prioritize human agency, rights, and well-being over automation.

Foster critical thinking about AI's societal impacts.

Ethics of AI

Address bias, privacy, and environmental sustainability.

Promote transparency and accountability in AI tools.

AI Foundations & Applications

Understand AI basics: data, algorithms, generative models.

Operate and evaluate AI tools for education.

AI Pedagogy

Integrate AI into lesson planning, assessments, and personalized learning.

Design AI-enhanced activities (e.g., chatbots for language practice).

AI for Professional Development

Use AI for self-assessment, peer collaboration, and lifelong learning.

Progression Levels



Acquire

Basic AI literacy (e.g., tool evaluation, ethical awareness).



Deepen

Advanced integration (e.g., bias mitigation, personalized learning design).



Create

Innovate with AI (e.g., co-develop tools, lead policy discussions).

EU AI Act's Risk Tiers for Education

Risk Level	Examples in Education	Regulations
Unacceptable	Social scoring, facial recognition in schools	Banned outright.
High Risk	Admissions algorithms, exam proctoring	Strict audits, human oversight required.
Limited Risk	Chatbots, plagiarism detectors	Transparency obligations (e.g., disclose AI use).
Minimal Risk	AI-powered games, spam filters	Voluntary compliance with ethical codes.

AI Tools

Chatbots



Application designed to simulate human conversation through text or voice interactions



Provide automated responses based on their training data.



Can understand user inputs and respond in a human-like manner.



Can be integrated into various platforms, including messaging applications, websites and mobile apps.

Popular Chatbots

ChatGPT

Claude

DeepSeek

Gemini

Microsoft
Copilot

Meta
Llama

Best Practices



Verify AI-generated content before using it in teaching materials



Teach students to cross-reference AI-provided information with reliable sources



Use AI as a supplementary tool rather than a primary source of information



Be cautious about sharing sensitive or personal information



Be aware of knowledge cutoff dates and potential biases in training data



Encourage using AI as a tool for learning, not a replacement for critical thinking

Implementation in the Classroom

Teaching Critical AI Literacy

AI Literacy goes beyond just knowing how to use AI tools like ChatGPT. It encompasses three key aspects:

- **Critical Thinking:** Questioning and maintaining healthy scepticism about AI's capabilities and limitations
- **Social Awareness:** Understanding how AI might affect different groups of people differently
- **Practical Evaluation:** Assessing the credibility and accuracy of AI outputs
- **Guidelines:** Stay Current, Promote Critical Engagement, Balance Perspectives.

AI's Capabilities and Risks

What It's Good At:

- Writing clear, grammatically correct text
- Explaining complex topics in simple terms
- Generating creative ideas
- Adapting its writing style for different audiences

What It Struggles With:

- Understanding deep context beyond its training
- Performing complex calculations
- Making ethical judgements

AI hallucinations refer to instances where AI models generate content that is factually incorrect or nonsensical.

1. Hallucinated content often seems believable at first glance
2. AI may present hallucinated information with high certainty
3. Hallucinations may contradict known facts or the AI's previous statements
4. Creation of non-existent details, people, or events

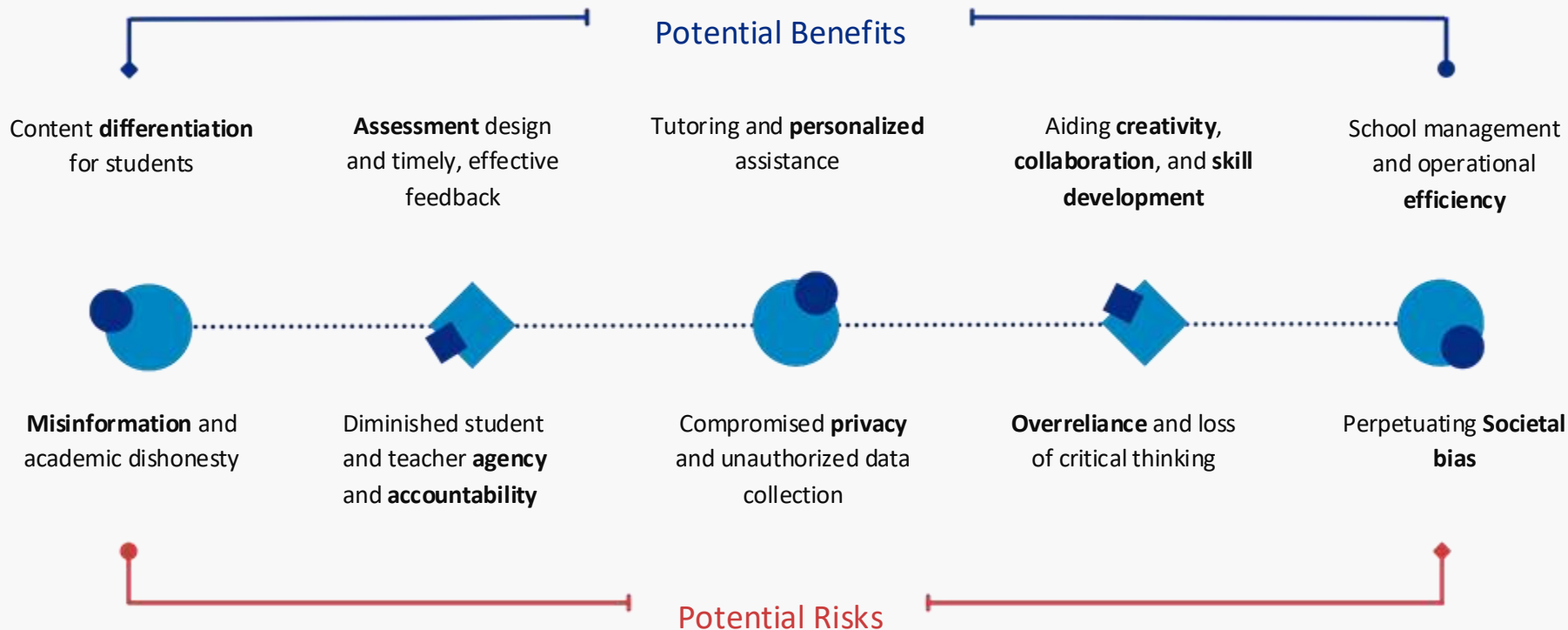
How AI Changes Teaching

Teaching AI

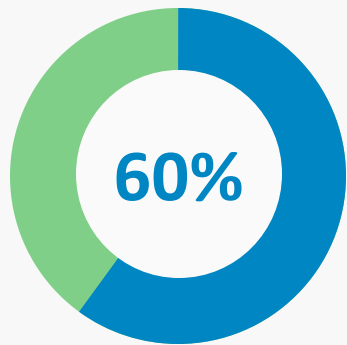
With and About

- Teaching **with** AI focuses on practical integration where AI serves as a tool to:
 - Support teachers in planning, assessment, and administrative tasks
 - Enhance student learning through personalized guidance and feedback
 - Streamline school operations and management systems
- Teaching **about** AI emphasizes understanding AI fundamentals through:
 - Core computer science and data science principles
 - Cross-disciplinary connections across mathematics, science, and social studies
 - Critical examination of AI's societal impact and ethical implications

Benefits and Risks

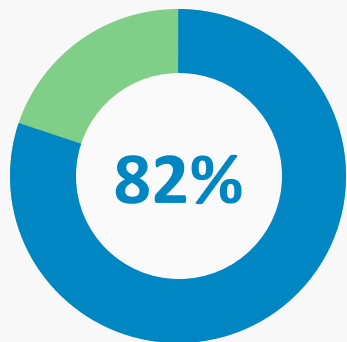


Preparing for Workforce Transformation



Jobs in advanced economies that will be complemented, or in extreme cases, replaced by AI.

[\(IMF, January 2024\)](#)



Leaders say their employees will need new skills to be prepared for the growth of AI.

[\(Microsoft, May 2023\)](#)

More than half of a teacher's job involves people skills, such as working directly with students, which are unlikely to be replaced by Gen AI.

[\(Linkedin, November 2023\)](#)

On the Near Horizon

Student Support/Personalized Learning

From: Traditional one-size-fits-all

To: Personalized learning at scale

How do AI learning platforms work:

- Continuous assessment of student performance
- Real-time adjustment of content difficulty
- Customized learning paths and individual knowledge graphs
- AI assistants to explain concepts more simply or provide guidance

Adapted Curriculum/Augmented Teaching

Curriculum:

- Critical thinking and problem-solving
- Creativity and innovation
- Digital literacy and AI competence
- Collaboration and communication
- Leadership and entrepreneurship

Teachers:

- AI-powered lesson planning tools
- Curriculum alignment assistance
- Resource suggestion
- Differentiation strategies for diverse learners
- Automated grading systems

Data-Driven Decision Making

How data + AI can enhance pedagogy

Learning analytics dashboards:

- Real-time insights into system-wide performance
- Identification of trends and patterns

Predictive models for education planning:

- Forecasting student enrolment and resource needs
- Identifying at-risk students for early intervention

Ethics and AI in the Classroom

Use

Teacher Support: AI Teaching Assistance

Student Learning: Personalized Pathways

School Operations: Surveillance

Concern

Replicating Ineffective Practices

Reducing Teacher and Student Agency

Privacy Risks and Bias

New Digital Divide?

Bridging the AI Divide

- Access Equity: Ensure fair distribution of AI tools and resources across different socioeconomic backgrounds and geographic locations
- Pedagogical Support: Develop teachers' AI literacy and provide frameworks for meaningful integration of AI into diverse learning environments
- Learning Opportunities: Create inclusive, high-quality learning experiences that prepare all students to understand, use, and critically evaluate AI technologies

Stakeholder Voices

•Students' Concerns & Needs:

- 62% worry about data privacy and security
- 72% seek guidance on responsible use of AI in academics

•Teachers' Perspectives:

- 60% recognize AI literacy as crucial for future employment
- 79% report lack of clear AI policies in their schools

•Parents' Outlook:

- 67% see AI benefits as equal to or outweighing risks
- Only 53% believe schools are preparing students for an AI future

“AI can also help educators identify gaps in student knowledge and provide targeted interventions to help students overcome their weaknesses.”

Cambridge Teacher

Are Teachers Prepared?

Teacher AI Readiness Gap

- Only 20% of teachers feel prepared to use Generative AI in their teaching, while just 29% have received any AI-related training
- Significant Disparities Exist: Urban schools and lower-income districts show lower rates of AI professional development
- Primary grade teachers have less access to AI training than their secondary counterparts

Any questions?

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