

Integrating Artificial Intelligence in Distance Learning

DETA2025 Conference
By Jody Joubert



UNIVERSITEIT VAN PRETORIA
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Workshop 2: Integrating Artificial Intelligence in distance learning

Introduction

Welcome to the workshop!

Generative Artificial Intelligence (GenAI) and Artificial Intelligence (AI) have become permanent features in the 21st Century classrooms. Hence, educators with their trainers must familiarise themselves with how to maximise the potential of these cognitive tools while paying attention to ethical and practical considerations.

Description

This four-hour workshop equips educators and instructional designers with the knowledge and skills to integrate Generative Artificial Intelligence (GenAI) and Artificial Intelligence (AI) as cognitive tools into distance education. Participants will explore AI applications that enhance teaching, learning and assessment, guided by the SPET Model (2023) and Activity Theory (2022), which emphasise learner-centred approaches and lifelong learning principles.

The workshop will consist of the following interactive sessions:

- Session 1: Participants will discover practical uses of AI in distance education through case studies and brainstorming activities.
- Session 2: Participants will design an actionable AI integration strategy tailored to their educational context.

The workshop concludes with a recap of key takeaways, a discussion on ethical and practical considerations, and resources for continued exploration. Participants will leave with a clearer understanding of how to integrate GenAI and AI effectively into their distance education offerings.

Requirements for participants

- A reliable Wi-Fi connection.
- An electronic device (laptop, tablet or smartphone).

Facilitator

Jody Joubert

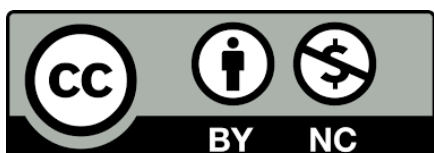
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This workshop works with a resource packed website. Click on the link below or scan the QR code to view the site.

<https://jodyjoubert.wixsite.com/deta2025>





UNLOCKING AI AS A MINDTOOL

Goal

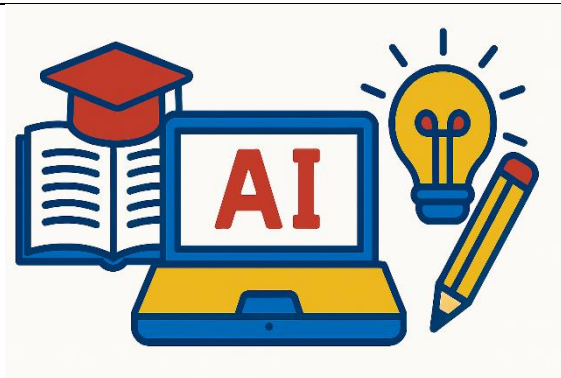


Establish a shared understanding of what it means to use computers as mindtools—technology that engages learners in deep thinking through interactivity, representation, and distributed cognition. This level sets the pedagogical foundation for all further workshop activities.

Your group must solve the puzzle

Use the resources at your disposal to solve the puzzle at the end.

You have these resources



- Four digital puzzles (each representing one core mindtool characteristic)
- QR codes to access puzzles (scan using your device)
- Groupmates (your “home group” of ~4 people)
- Internet access and a device (smartphone or laptop)

The puzzles



Puzzle 1



Puzzle 2



Puzzle 3



Puzzle 4



You need the open the locks



Through this activity you need unlock three locks on the Flippity puzzle. Scan the QR Code below to access the Flippity puzzle.





EXPERT GROUP ACTIVITY

Goal

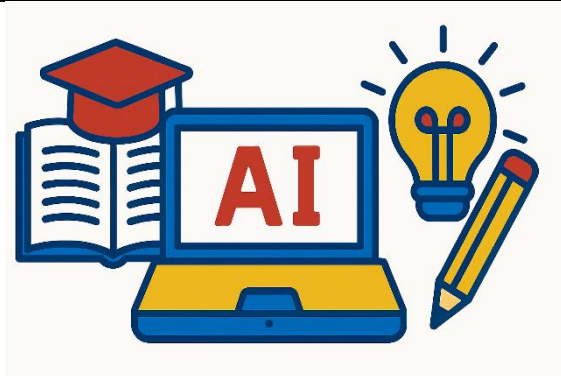


Produce a case insight document and a transcript of your thinking with ChatGPT to demonstrate understanding. Engage deeply with one real-world case of AI in distance education. Use ChatGPT and curated resources to uncover the practical applications, educational purpose, and alignment good practice.

Your group must produce two artifacts:

- Your chat transcript (text-based, not screenshot)
- Case Insight Document

You have these resources



You must provide this context to ChatGPT — either by attaching files to conversation, creating a project, pasting key excerpts or summarising them in your own words.

- Your case article
- A case summary
- One article on the SPET Model
- Two articles on Computers as Mindtools

Case Articles

- Case 1** Henkel, O., Horne-Robinson, H., Kozhakhmetova, N., & Lee, A. (2024, July). Effective and scalable math support: Experimental evidence on the impact of an AI-math tutor in Ghana. In *International Conference on Artificial Intelligence in Education* (pp. 373-381). Cham: Springer Nature Switzerland.



- Case 2** Eltigani, H., Haroon, R., Kocak, A., Faisal, A. B., Martin, N., & Dogar, F. (2025). WaLLM--Insights from an LLM-Powered Chatbot deployment via WhatsApp. *arXiv preprint arXiv:2505.08894*.



Case 3 Lu, R. S., Lin, H. C. K., Yang, Y. C., & Chen, Y. P. (2024). Integrating Urban Mining Concepts Through AI-Generated Storytelling and Visuals: Advancing Sustainability Education in Early Childhood. *Sustainability* (2071-1050), 16(24).



Case 4 Bardia, A., & Agrawal, A. (2025). MindCraft: Revolutionizing Education through AI-Powered Personalized Learning and Mentorship for Rural India. *arXiv preprint arXiv:2502.05826*.



Case Summaries

CASE 1

In Ghana, where fewer than 15% of students achieve minimum math proficiency, Rori—an AI-powered tutor accessed via WhatsApp—was introduced to address the shortage of personalized support in under-resourced classrooms. Designed for students in Grades 3 to 9, Rori provides twice-weekly, 30-minute sessions during study hall using shared mobile phones. This mobile-first approach works on low-bandwidth networks, making it viable in contexts with limited infrastructure.

Rori delivers over 500 scaffolded micro-lessons aligned to global math standards. Through conversational AI, it interprets student input, offers hints, gives worked solutions, and encourages metacognitive reflection. Unlike rigid, button-based interfaces, its natural language design fosters active engagement and autonomy.

An experimental study across 11 schools showed that students using Rori achieved significantly greater math gains than their peers, with an effect size of 0.36—comparable to an extra year of learning. The intervention helps overcome challenges common in distance education: lack of feedback, limited access, and learner isolation.

Practically, Rori performs functions such as tutoring, content generation, feedback, and scaffolding—tasks difficult to scale with human teachers alone. Its low cost (~\$5 per student) and ease of implementation mean it could serve broader educational systems, not just individuals. It requires minimal teacher training and fits into existing school schedules.

While the design did not explicitly address long-term safety or fairness, its simplicity and focus on equity position it well for scalable use. For other low-resource settings, including parts of South Africa, such a tool could reshape support for foundational learning—if conditions like mobile access, cultural readiness, and institutional support are in place.

CASE 2

The WaLLM chatbot was developed to address the pressing issue of limited access to reliable, high-quality information in developing regions, where users often face infrastructural, financial, and digital literacy barriers. Aimed at adult users in Pakistan, Sudan, and diaspora communities in the U.S., WaLLM operates entirely through WhatsApp—a platform already embedded in local communication habits. This learning context leverages users’ familiarity with WhatsApp to minimize the learning curve, making the chatbot an accessible entry point to generative AI. Powered by multiple large language models (LLMs), WaLLM provides factual answers to user-submitted queries, particularly around health, education, and personal development, and augments this with interactive features such as daily “Top Questions,” AI-suggested follow-ups, and a gamified leaderboard. These features not only enhance engagement but also support sustained learning over time.

WaLLM directly supports distance education by providing asynchronous, text-based access to expert-like guidance without requiring advanced hardware or internet infrastructure. It performs several practical functions: answering factual questions, drafting text, translating language, generating follow-ups, and offering curated content drawn from prior queries. By reducing the cognitive and technical load typically required to engage with AI systems, it empowers users to articulate needs, reflect on responses, and iterate learning. The collaborative dynamic between user and AI—especially through personalized interaction histories and follow-up suggestions—enables a level of co-construction that would be difficult to achieve independently. In educational contexts like low-resource distance programs, this tool could be adapted to enhance learner agency and support curriculum-aligned exploration.

To implement WaLLM locally, support would be needed in the form of WhatsApp Business API integration, culturally relevant content tuning, and trust calibration mechanisms to mitigate risks of misinformation. Its broader value lies in democratizing AI access while revealing potential exclusions due to English-only interfaces or subscription-free limitations in more advanced models

CASE 3

The AI tool described in this study was designed to address the challenge of effectively introducing complex sustainability concepts—specifically urban mining and resource conservation—to preschool children in an engaging, age-appropriate manner. The main users are young learners aged 5 to 6, operating within a senior kindergarten context in Southern Taiwan. Through a custom-designed digital interface, children accessed interactive stories generated by ChatGPT and accompanied by AI-generated visuals. These stories were presented in two formats: unstructured and structured. The structured format—used with the experimental group—followed a teacher-designed narrative framework including theme, plot, character background, and resolution. This scaffolding supported comprehension and creative expression, making abstract environmental issues more accessible to young minds.

The AI system played a dual role: generating content and delivering it via an intuitive interface with animation, sound, and touch navigation, allowing children to independently explore sustainability themes. For distance learning, the digital delivery reduces reliance on paper and physical resources, supports equitable access when technology is available, and facilitates repeated, self-paced engagement. The AI's core practical functions included story creation, visual illustration, and interaction support, enhancing engagement and understanding.

This AI-supported model transformed the learning experience by fostering language development, storytelling ability, and creative thinking, especially in children exposed to the structured narrative version. It also addressed key distance education challenges such as engagement, comprehension of abstract topics, and digital literacy in early childhood. Broader educational value lies in its capacity to instill environmental awareness early, reduce environmental impact, and adapt content for various learning styles. However, scalability requires access to devices and trained teachers. The AI and child collaboratively produced narrative expressions that neither could create alone. In contexts such as digitally enriched early education, this tool opens possibilities for integrating sustainability with foundational literacy, provided that local implementation includes teacher training, content scaffolding, and device availability

CASE 4

MindCraft was developed to tackle the systemic educational inequities experienced by rural learners in India, where poor infrastructure, lack of mentorship, and minimal access to digital learning tools inhibit academic growth. Aimed primarily at rural students like Ravi—a 14-year-old from Madhya Pradesh—the platform offers a comprehensive AI-powered solution designed to transform learning in low-resource contexts. Operating within distance education frameworks, MindCraft delivers personalized content tailored through skill assessments, with lessons and quizzes dynamically adjusted to a learner's pace and language preferences, including Hindi. It functions even in offline mode, addressing challenges of connectivity and ensuring continuity in learning despite geographical isolation or limited bandwidth.

The AI performs multiple practical functions: diagnosing learning gaps, generating adaptive learning paths, offering real-time tutoring, and facilitating career discovery through mentorship matchmaking. In Ravi's case, this meant evolving from struggling in math and English to excelling, guided by interactive AI modules and inspired by a mentor who introduced him to programming. MindCraft goes beyond basic content delivery; it fosters self-regulated learning, supports collaboration through peer challenges, and integrates with classroom instruction by generating structured lesson plans for teachers, easing their workload.

This platform also confronts broader educational challenges: it democratizes access to high-quality learning experiences, offers multilingual and culturally relevant content, and accommodates diverse learners through mobile-friendly, low-data UX design. While the platform empowers students and educators alike, its impact depends on supportive infrastructure and professional development for rural teachers. In contexts like South Africa or other underserved regions, MindCraft presents promising possibilities—provided local adaptation, mentorship networks, and language integration are in place. The model illustrates a synergistic human-AI partnership, where neither could achieve such transformation alone, making it a compelling blueprint for equitable, scalable, and sustainable distance education innovation.

SPET Model

Xu, X., Sun, Y., Weng, J., & Zhang, Y. (2023, November). Theoretical framework of personal learning environments: SPET model. In *International Conference on Technology in Education* (pp. 139-156). Singapore: Springer Nature Singapore.

Computers as mindtools

Jonassen, D. H. (1994). Technology as cognitive tools: Learners as designers. *ITForum Paper*, 1(1), 67-80.

Pakdaman-Savoji, A., Nesbit, J., & Gajdamaschko, N. (2019). The conceptualisation of cognitive tools in learning and technology: A review. *Australasian Journal of Educational Technology*, 35(2).



Decide how you want to use ChatGPT



Your group should decide how you'd like ChatGPT to assist you. Here are some roles and starter prompt to help you get going quickly. You can adapt the prompts, or ask ChatGPT to help you if you want a prompt for another role.

Debating Buddy

Challenges your thinking or offers other perspectives

Prompt:

Play devil's advocate and debate with me based on this case, and the resources that I have provided. I will make statements and you will debate with me. Ready for the first one?

Faux Expert (with context)

Acts like it has deep knowledge of your article/resources

Prompt:

We're pasting parts of an article about a case. Read and respond like you're an expert in the case. We will ask question one by one are you ready?

OR

We have attached articles about a case. Read and respond like you're an expert in the case. We will ask question one by one are you ready?

Memory Partner

Helps you remember key points from your discussion

Prompt:

We're going to paste some key takeaways from our reading and chat. Keep track of them and help us refer back later

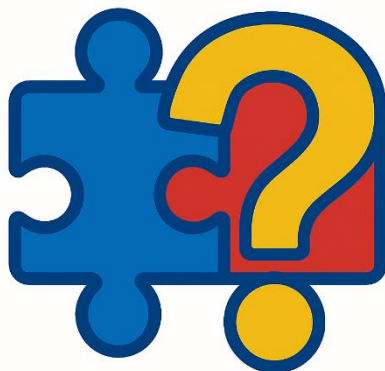
Clarifier

Explains or simplifies confusing sections

Prompt:

I will be providing pieces of text to you based on a case that I have to paster. Can you please clarify the content of the source(s) in such a way that they are easily understandable? I will ask for clarifications one by one. Are you ready?

Guiding questions to absolutely understand your case



1. What educational problem was this AI tool designed to solve?
2. Who are the main users? (e.g., students, teachers, mentors, administrators)
3. What is the learning context? (e.g., subject area, level of education, formal/informal, synchronous/asynchronous, geographic or technological setting)
4. How is AI actually used in this case — what does it do?
5. How does this case support learning at a distance? (e.g., mobile access, offline use, flexibility, asynchronous or remote learning)
6. What practical functions does the GenAI perform in this case? (e.g., generating content, tutoring, giving feedback, guiding reflection, translation, planning)
7. How does this tool improve or transform the distance learning experience? (Think beyond convenience — does it support deeper learning, more autonomy, or better outcomes?)
8. What challenges of distance education does the case try to solve? (e.g., learner isolation, access, personalization, scaffolding, bandwidth limitations)

9. What broader educational value does this AI tool offer — beyond just helping one learner? Consider:
- Who benefits, and who might still be left out?
 - How does the tool relate to teaching, curriculum, or systems of support?
 - In what ways is the technology well-matched — or poorly matched — to its context?
 - What signs are there (if any) that the designers thought about safety, fairness, or long-term use?
10. How does the use of AI allow the learners in this case to see, express, organise, or reflect on their learning?
11. Are the learner and the AI doing something together that neither could do alone?
12. What possibilities does this case open up for your own context? What could teaching or learning look like if something like this were used meaningfully where you work?
13. What conditions, support, or adaptations would be needed to make something like this work well in your setting? What would need to be in place — practically, culturally, institutionally — to take the first steps?

Your group must produce two artifacts



Your chat transcript (text-based, not screenshot)

Option A: Prompt ChatGPT to summarise your conversation

Ask:

“Please summarise this conversation as a written transcript or dialogue. Highlight the questions we asked, your responses, and any key takeaways we explored.”

Then:

- Copy-paste the result into a text document or editable format
- Add your group name and members at the top

Option B: Copy the chat log manually

- Highlight and copy your full conversation (questions and responses)
- Paste into a text editor
- Label it clearly: Group Name – Chat Transcript

Case insight document

Once your group discussion is complete, you can ask ChatGPT to compile a written summary. Try this prompt:

“Using everything we’ve discussed, write a short case insight document. Focus on what this case shows about the practical use of AI in distance education. Include how the tool works, what it helps with, challenges it addresses, and how it might apply to teacher training.”

Then:

- Review and edit the output together
- Copy-paste the final version into a shared folder or hand it in as instructed



TEACHING GROUP ACTIVITY

Goal

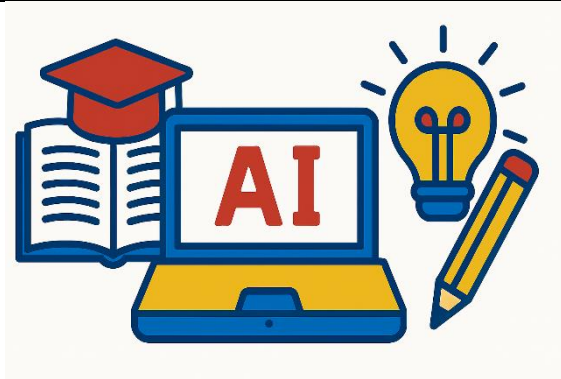


Work across cases to collaboratively come up with practical ideas for how AI could be used in distance teacher training. Use ChatGPT as a thinking partner to guide your group's reflection and surface design principles that are innovative, grounded, and appropriate to your own teaching context.

Your group must produce two artifacts:

- Your Chat Transcript (text-based, not screenshot)
- A list of practical ideas for good use of AI in distance education.

You have these resources



You must provide this context to ChatGPT — either by attaching files to conversation, creating a project, pasting key excerpts or summarising them in your own words.

1. Your case articles
2. A case summary
3. One article on the SPET Model
4. Two articles on Computers as Mindtools
5. Your own Case Insight document from the previous step.

Guiding questions to develop practical ideas



What inspired you? *What moments or strategies from the four cases felt adaptable, powerful, or surprising?*

What might teacher training need that these cases hint at? *Think about teachers as learners: what do they need support with? What would meaningful AI use look like?*

What new possibilities could emerge? *Can AI open up new forms of mentorship, collaboration, feedback, or planning for teachers at a distance?*

Use ChatGPT



Prompt

We've worked with four real-world cases of AI in distance education. Ask us thoughtful questions that will help us generate practical ideas for how AI could be used in distance teacher training. Based on your questions, we will answer with what we've learned from the cases to guide your questions. Please keep track of the practical ideas as we progress. We need to provide the presenter of the workshop with a list of ideas by the end of this discussion

Your group must produce two artifacts



Your Chat Transcript (text-based, not screenshot)

You have two options:

Option A: Prompt ChatGPT to summarise your conversation

Ask:

“Please summarise this conversation as a written transcript or dialogue. Highlight the questions we asked, your responses, and any key takeaways we explored.”

Then:

- Copy-paste the result into a text document or editable format
- Add your group name and members at the top

Option B: Copy the chat log manually

- Highlight and copy your full conversation (questions and responses)
- Paste into a text editor
- Label it clearly: Group Name – Chat Transcript

List of Practical ideas

Once your group discussion is complete, you can ask ChatGPT to compile a written summary. Try this prompt:

“Please list the practical ideas we developed during this conversation about using AI in distance teacher training. Make sure they are phrased clearly and concisely”

- Review and refine the list as a group – add edit or remove items as needed.
- You may add a short heading or categories if you wish
- Copy-paste the final version into a document and label it:

Group Name – Practical Ideas List



DREAM ACTIVITY

Goal



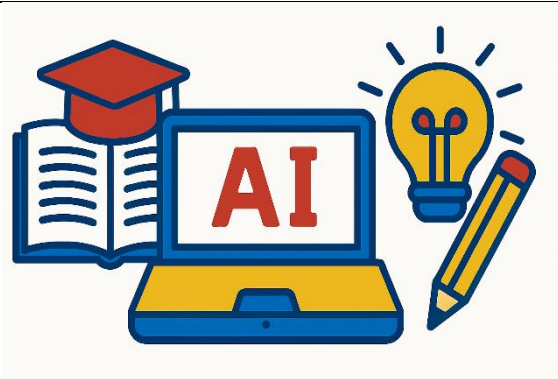
Envision how AI - especially GenAI tools like ChatGPT - can be creatively, meaningfully, and ethically integrated into your own (distance) education context. This is your chance to dream big, grounded in the insights you've gained so far.

You must produce two artifacts

This can be done individually or as a group. You need not maintain your home group.

- Your Chat Transcript (text-based, not screenshot)
- Your A3 “Dream Sheet”

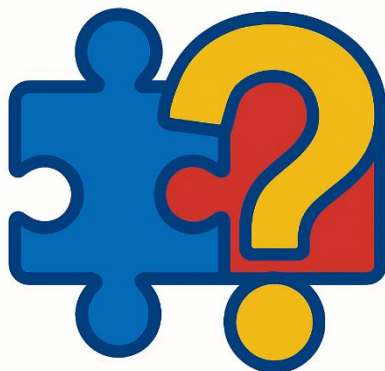
You have these resources



You can decide how to use the resources at your disposal to best accomplish the tasks.

1. Key insights from Levels 2 - Examples of successful AI use in education.
2. Practical ideas from Level 3 – directions for your innovation
3. An A3 sheet to visually express your ideas.
4. Writing/drawing tools (markers, pens, etc.).

Guiding questions for your dream implementation



If I had no limitations, what's one way I'd use AI to enhance my distance teaching practice?

What part of my teaching could be reimaged with the help of AI?

What practical first steps could I take in the next month to experiment with AI as a mindtool?

How would this integration reflect my values, pedagogy, and student needs?

You must produce two artifacts



Your chat transcript (text-based, not screenshot)

You have two options:

Option A: Prompt ChatGPT to summarise your conversation

Ask:

“Please summarise this conversation as a written transcript or dialogue. Highlight the questions we asked, your responses, and any key takeaways we explored.”

Then:

- Copy-paste the result into a text document or editable format
- Add your group name and members at the top

Option B: Copy the chat log manually

- Highlight and copy your full conversation (questions and responses)
- Paste into a text editor
- Label it clearly: Group Name – Chat Transcript

Your A3 “Dream Sheet”

This physical artefact should include:

- A description (and/or sketch) of your AI integration idea.
- Notes or diagrams showing how it links to your practice.
- Your responses to the guiding questions.
- Take a photo of your A3 sheet.



ALL DONE! 😊





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