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UQSchoolsNet - Future Ready with AI (July 2026)

Practical AI: Choose your Adventure

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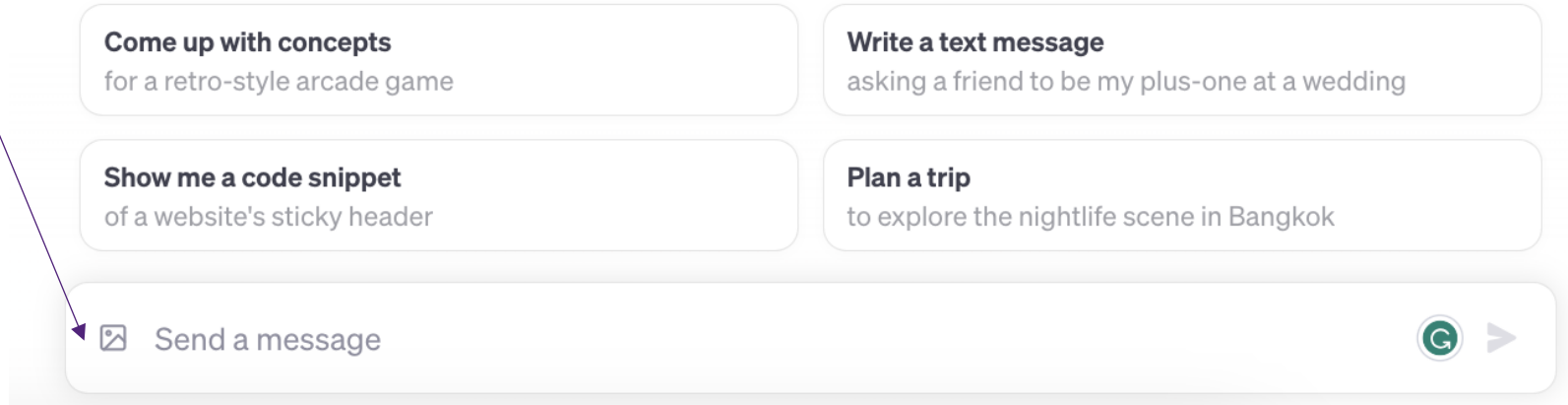
A new human computer interface

OpenAI ChatGPT was released on 30 Nov 2022

A prompt is a piece of text that triggers a specific response or action



Rarely has a technology possessed such profound potential to both revolutionize and challenge the boundaries of education

- Answer questions
- Feedback on writing
- Feedback on programming
- Brainstorm new ideas
- Personalised Chatbot tutors/mentors

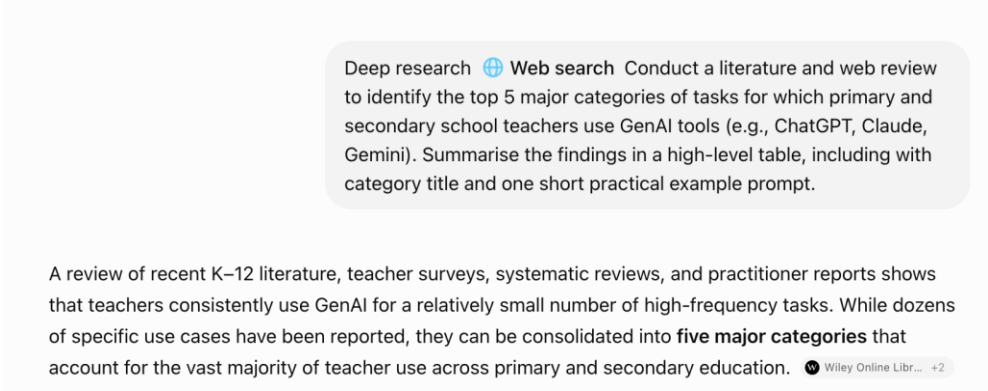
- Provide direct answers across multiple domains
- Write essays for you
- Write programming code for you
- Perform data analysis

Initial Flaws Identified by Educators

3.5 years since the first initial release and already most are not valid …

Can’t take feedback	Can’t reflect	Can’t do math	I’ll be able to detect it
The text will have false facts	Can't include references	Can't understand images	Can't reason

Current LLM Prompts for Teachers



Category	Description	Example Prompt
1. Lesson Planning & Curriculum Design	Creating lesson plans, learning sequences, classroom activities, discussion questions, and aligning content to curriculum standards. This is consistently reported as the most common teacher use of GenAI. Wiley Online Libr... +2	*"Create a Year 8 Science lesson on ecosystems aligned to the Australian Curriculum with a learning intention, success criteria, engaging activity and exit ticket."*
2. Teaching Resource & Content Creation	Producing worksheets, reading passages, presentations, examples, worked solutions, quizzes, classroom games and differentiated learning materials. ScienceDirect +2	*"Generate a Year 5 mathematics worksheet on fractions with 10 questions at three difficulty levels and an answer key."*
3. Assessment, Feedback & Differentiation	Designing assessments and rubrics, generating formative quiz questions, drafting personalised feedback, modifying activities for different ability levels and learning needs. Springer Nature +2	*"Provide constructive feedback on this Year 10 persuasive essay using our rubric, then suggest one extension activity and one scaffolded revision task."*
4. Administrative & Professional Communication	Drafting parent emails, newsletters, report comments, meeting agendas, behaviour notes, permission slips and other administrative documentation. This is one of the largest time-saving uses reported by teachers. ERIC +2	*"Write a friendly email to parents explaining our upcoming Year 6 excursion, including learning goals, logistics and what students need to bring."*
5. Classroom Support & Personalised Learning	Creating explanations, examples, differentiated questions, tutoring dialogues, role plays and personalised learning supports for individual students or small groups. Wiley Online Libr... +2	*"Explain photosynthesis to a Year 7 student who is struggling, using simple language, analogies and two short comprehension questions."*

Current LLM Prompts for Teachers

Create image Turn the findings into an info graphic

“Challenge what you can create…

“Challenge your thinking of learning with AI…

Text instructions are all you need

Metacognitive Laziness

Beware of metacognitive laziness: Effects of generative artificial intelligence on learning motivation, processes, and performance

Yizhou Fan, Luzhen Tang, Huixiao Le, Kejie Shen, Shufang Tan, Yueying Zhao, Yuan Shen, Xinyu Li, Dragan Gašević

First published: 10 December 2024 | https://doi.org/10.1111/bjet.13544 | VIEW METRICS

Read the full text > PDF TOOLS SHARE

Abstract

With the continuous development of technological and educational innovation, learners nowadays can obtain a variety of supports from agents such as teachers, peers, education technologies, and recently, generative artificial intelligence such as ChatGPT. In particular, there has been a surge of academic interest in human-AI collaboration and hybrid intelligence in learning. The concept of hybrid intelligence is still at a nascent stage, and how learners can benefit from a symbiotic relationship with various agents such as AI, human experts and intelligent learning systems is still unknown. The emerging concept of hybrid intelligence also lacks deep insights and understanding of the mechanisms and consequences of hybrid human-AI learning based on strong empirical research. In order to address this gap, we conducted a randomised experimental study and compared learners' motivations, self-regulated learning processes and learning performances on a writing task among different groups who had support from different agents, that is, ChatGPT (also referred to as the AI group), chat with a human expert, writing analytics tools, and no extra tool. A total of 117 university students were recruited, and their multi-channel learning, performance and motivation data were collected and analysed. The results revealed that: (1) learners who received different learning support showed no difference in post-task intrinsic motivation; (2) there were significant differences in the frequency and sequences of the self-regulated learning processes among groups; (3) ChatGPT group outperformed in the essay score improvement but their knowledge gain and transfer were not significantly different. Our research found that in the absence of differences in motivation, learners with different supports still exhibited different self-regulated learning processes, ultimately leading to differentiated performance. What is particularly noteworthy is that AI technologies such as ChatGPT may promote learners' dependence on technology and potentially trigger "metacognitive laziness". In conclusion, understanding and leveraging the respective strengths and weaknesses of different agents in learning is critical in the field of future hybrid intelligence.

https://bera-journals.onlinelibrary.wiley.com/doi/10.1111/bjet.13544

Practitioner notes

What is already known about this topic

- Hybrid intelligence, combining human and machine intelligence, aims to augment human capabilities rather than replace them, creating opportunities for more effective lifelong learning and collaboration.
- Generative AI, such as ChatGPT, has shown potential in enhancing learning by providing immediate feedback, overcoming language barriers and facilitating personalised educational experiences.
- The effectiveness of AI in educational contexts varies, with some studies highlighting its benefits in improving academic performance and motivation, while others note limitations in its ability to replace human teachers entirely.

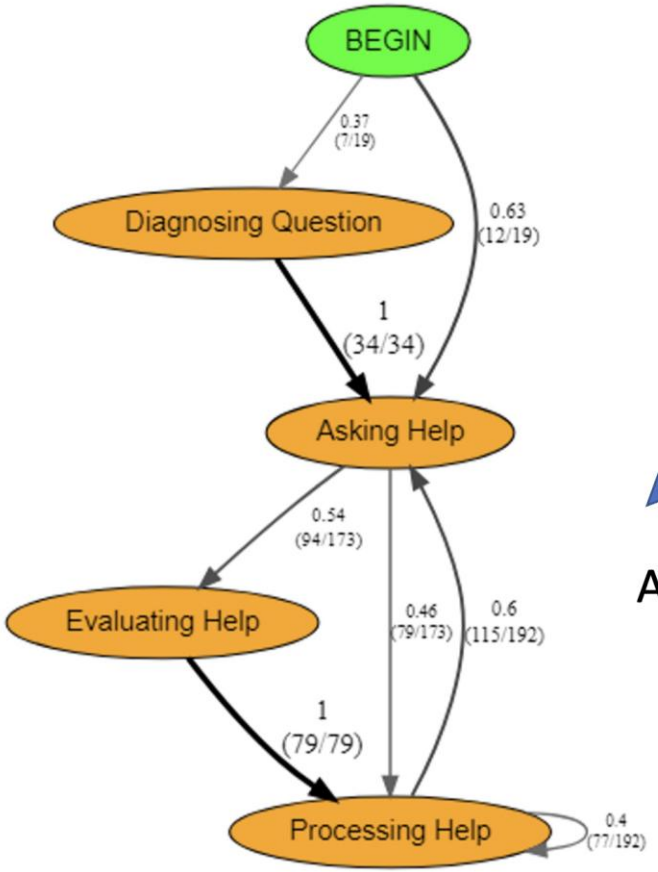
What this paper adds

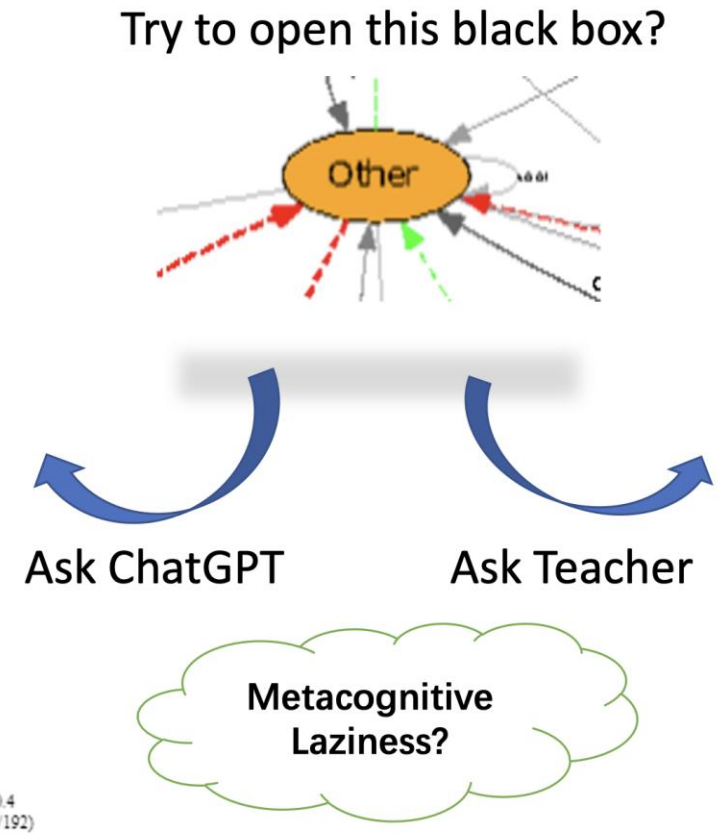
- We conducted a randomised experimental study in the lab setting and compared learners' motivations, self-regulated learning processes and learning performances among different agent groups (AI, human expert and checklist tools).
- We found that AI technologies such as ChatGPT may promote learners' dependence on technology and potentially trigger metacognitive "laziness", which can potentially hinder their ability to self-regulate and engage deeply in learning.
- We also found that ChatGPT can significantly improve short-term task performance, but it may not boost intrinsic motivation and knowledge gain and transfer.

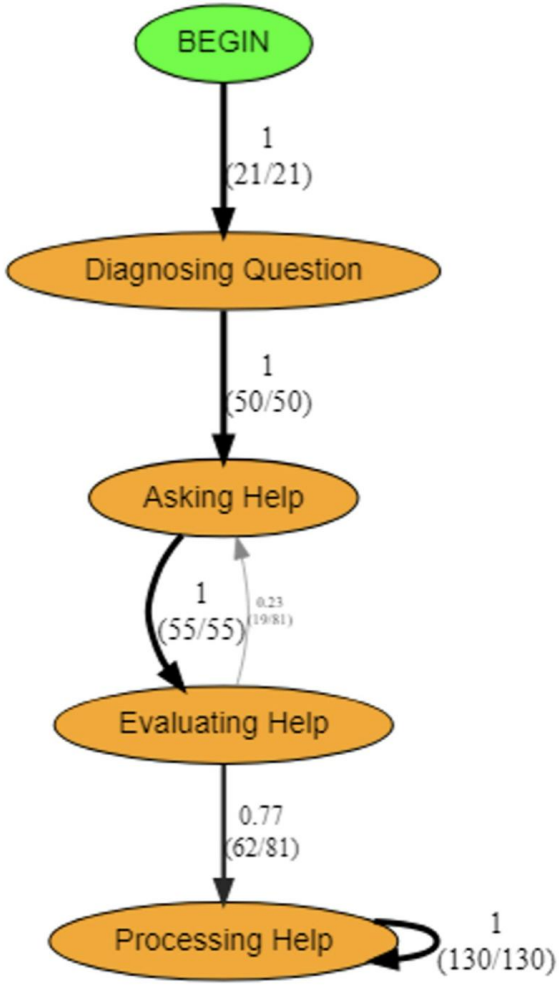
Implications for practice and/or policy

- When using AI in learning, learners should focus on deepening their understanding of knowledge and actively engage in metacognitive processes such as evaluation, monitoring, and orientation, rather than blindly following ChatGPT's feedback solely to complete tasks efficiently.
- When using AI in teaching, teachers should think about which tasks are suitable for learners to complete with the assistance of AI, pay attention to stimulating learners' intrinsic motivations, and develop scaffolding to assist learners in active learning.
- Researcher should design multi-task and cross-context studies in the future to deepen our understanding of how learners could ethically and effectively learn, regulate, collaborate and evolve with AI.

Comparing Help Seeking Processes







Chen, A., Xiang, M., Zhou, J., Jia, J., Shang, J., Li, X., ... & Fan, Y. (2025). Unpacking help-seeking process through multimodal learning analytics: A comparative study of ChatGPT vs Human expert. Computers & education, 226, 105198.

Cognitive Offloading to Cognitive Surrender

	Surrender	Offloading	Agency
Cognitive	• Accepting AI-summarised search results • Accepting AI-suggested corrections and completions uncritically	• Using AI to write an essay • Having AI summarise a reading • Asking AI to explain a concept	• Asking AI to be a provocateur • Setting up a custom AI that you can 'teach' • Using AI to provide viewpoints not encountered elsewhere
Meta-cognitive	• Going along with AI suggestions for what, how, when to learn • Not monitoring own use of AI • Using AI as a Socratic tutor	• Asking AI to plan a study schedule • Seeking AI advice on how to unpack a concept	• Asking AI to identify unknown unknowns • Using AI to produce practice scenarios

"A few recent articles have been exercising me lately, around cognitive and metacognitive offloading and 'surrender'. In preparing for an upcoming talk, I've been trying to think about what this looks like on the ground in classrooms and elsewhere."

Danny Lui's LinkedIn Post
https://www.linkedin.com/posts/dannydotliu_ai-education-teaching-activity-7450757129696616448-fPkd

Productive Failure – The missing element?

Towards the Pedagogical Steering of Large Language Models for Tutoring: A Case Study with Modeling Productive Failure

Romain Puech[1,2], Jakub Macina[1,3], Julia Chatain[4], Mrinmaya Sachan[1], Manu Kapur[4]

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Abstract

One-to-one tutoring is one of the most efficient methods of teaching. With growing popularity of Large Language Models (LLMs), there have been efforts to create LLM-based conversational tutors which can expand the benefits of one-to-one tutoring to everyone. However, current LLMs are trained primarily to be helpful assistants and lack crucial pedagogical skills. For example, they often quickly reveal the solution to the student and fail to plan for a richer multi-turn pedagogical interaction. To use LLMs in pedagogical settings, they need to be steered to use effective teaching strategies: a problem we introduce as *Pedagogical Steering*. We develop StratL, an algorithm to optimize LLM prompts and steer it to follow a predefined multi-turn tutoring plan represented as a transition graph. As a case study, we create a prototype tutor for high school math following *Productive Failure* (PF), an advanced and effective learning design. To validate our approach in a real-world setting, we run a field study with 17 high school students in Singapore and show that StratL succeeds in steering the LLM to follow the PF tutoring strategy. Finally, we highlight challenges in Pedagogical Steering of LLMs and offer opportunities for further improvements by publishing a dataset of PF problems[1] and our code[2].

Models (LLMs), there has been a growing interest in using them to make tutoring affordable by building conversational tutoring systems (Jurenka et al., 2024; Khan, 2023). However, previous research has highlighted the lack of pedagogical properties of LLMs (Macina et al., 2023b; Tack and Piech, 2022). Most LLMs are instruction-tuned to optimize for a broad set of human preferences (Ouyang et al., 2022; Zhang et al., 2023), leading to assistant-like responses. However, a tutor's goal is to maximize learning, not user satisfaction.

These two goals can be contradictory. For example, if a student asks for help, providing them directly with the solution would likely maximize their satisfaction and be the response preferred by LLMs (Macina et al., 2023a). Yet, it is more efficient from a learning standpoint to promote students' active engagement and let them cognitively engage with the problem, for example, by providing an indirect hint or asking a guiding question (Freeman et al., 2014; Merrill et al., 1992). Moreover, existing LLM tutors are optimized and mostly evaluated for single-turn requests, while a tutoring dialog should be envisioned as a multi-turn teacher-student interaction where the teacher uses various pedagogical cues (Merrill et al., 1992). As LLMs are not natively made for tutoring, we introduce the shift from their user-serving goal to

https://aclanthology.org/2025.findings-acl.1348.pdf

The AI Training Wheels Fallacy

The False Metaphor

Training wheels facilitate independent balance. Real learning requires internalizing mechanics.

THE "REMOVAL" REALITY CHECK:
You can remove the aid and still ride the bike because you learned to pedal.

VS.

The Risk of Over-Reliance

Basic AI prompting simply replaces the effort entirely.

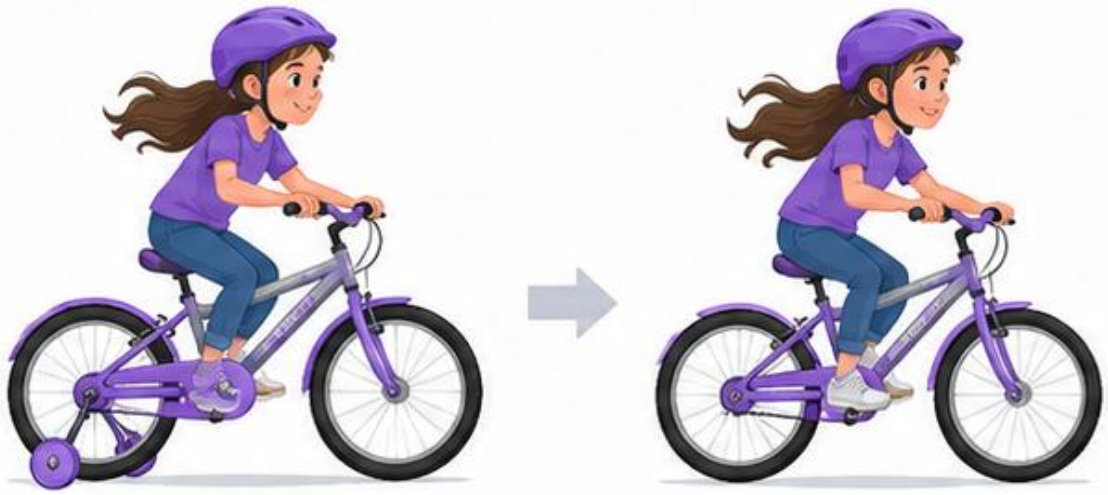
THE BASIC PROMPT TRAP:
Letting AI do 100% of the work results in zero transferable skill acquisition.

Notebook

Learning to Learn with GenAI

GenAI is not like bicycle training wheels.

When you take it away,
it has not helped you learn.



We need strategies
to help us learn with GenAI.

- Learn Fundamentals
- Learn to Learn with AI
- Think critically and independently

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Choose Your Adventure

Choose Your Adventure Labs

Lab 1: Learning Resources	Lab 2: Chatbot Tutors
Create Worksheets with Teacher Step by Step Solutions	Create a Pedagogical Moves Tutor
Build an Interactive Glossary	Create a Design Thinking/Brainstorming Tutor
Developing Student Evaluative Judgement	Create a Programming Tutor that helps build debugging and code reading skills
Build a Geometry Sailboat Game	Create an Offline Math Equation Intelligent Tutor

Go to: https://prompting.uqcloud.net

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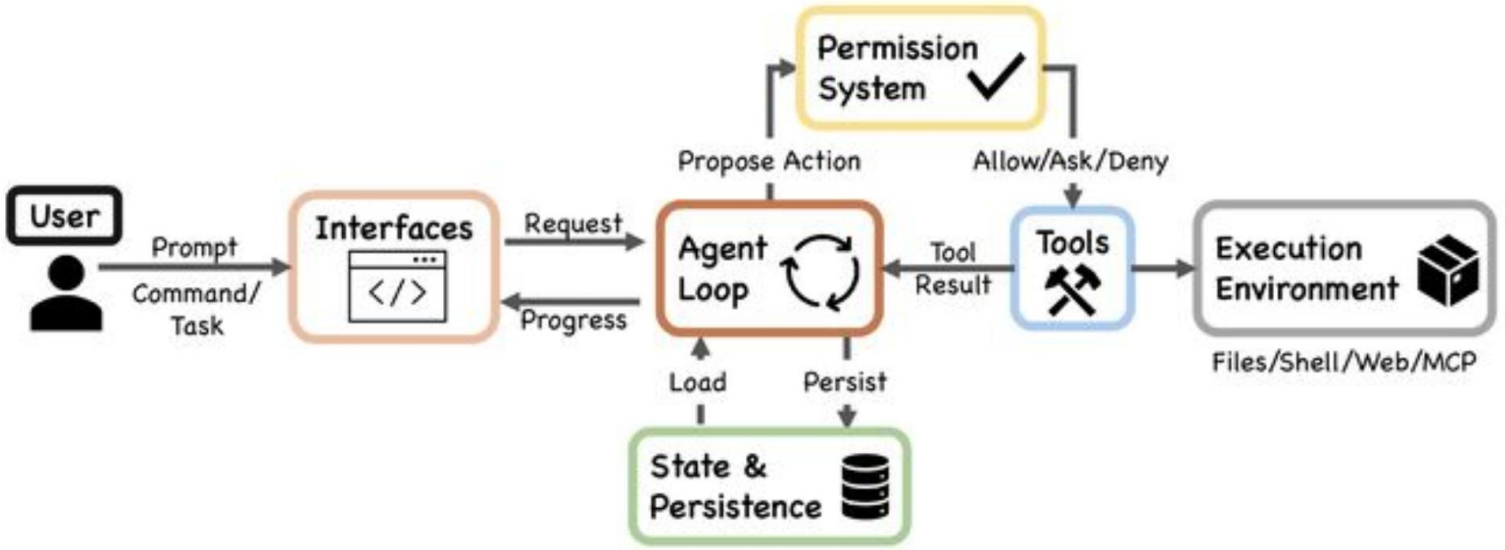
Why Learning to Learn with GenAI Matters?

The Agentic Harness



Tools:
Claude Code; Open AI Codex; Google Antigravity; Claude Cowork (for knowledge workers)

- Plan
- Spawn agents
- Supports longer running tasks
- Setup coding environments
- Execute
- Review and fix
- Write tests and test the UI in the browser
- Go from high level idea to working product/artefact
- Much more (whole computer access)
- Can run with little human input

https://www.linkedin.com/posts/charlesmartin14_dive-into-claude-code-a-comprehensive-overview-activity-7451489099615731712-LIQh

AI COMPETENCY FRAMEWORK FOR STUDENTS

PREPARING STUDENTS TO BE RESPONSIBLE AND CREATIVE CITIZENS IN THE ERA OF AI

HUMAN-CENTRED MINDSET

- I recognize AI is created by people and affects human lives.
- I take responsibility for how I use AI and who it impacts.
- I shape the future of AI with empathy, curiosity & social purpose.

ETHICS OF AI

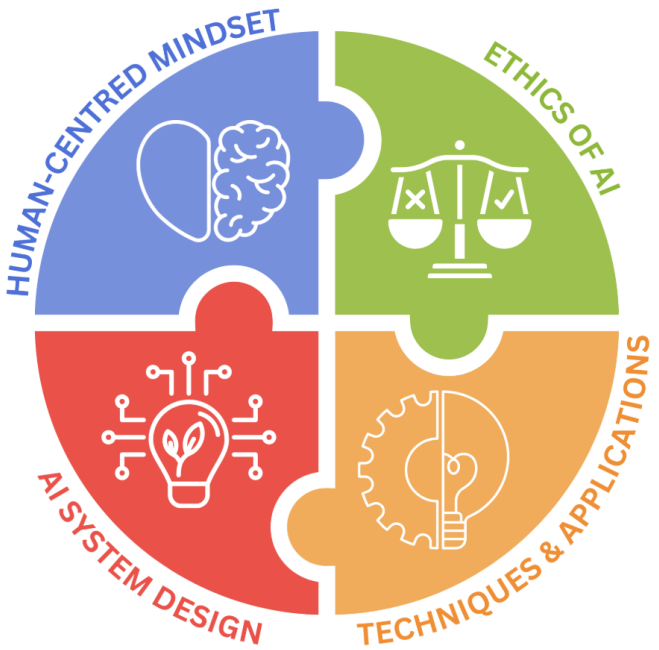
- I know AI can raise issues of fairness, bias, and rights.
- I make sure I use AI safely, ethically, and fairly.
- I design or evaluate AI to be ethical from the start, including all voices.

AI SYSTEM DESIGN

- I can define a problem for AI and know what it takes to build a useful system.
- I can plan, design, and build simple AI systems that reflect ethical and technical thinking.
- I improve and evaluate AI systems based on testing, feedback, and impact on people and society.

TECHNIQUES & APPLICATIONS

- I understand how AI uses data and algorithms
- I can build or use AI tools thoughtfully and critically.
- I create or improve AI tools with real-world impact and ethical awareness.



UNDERSTAND APPLY CREATE

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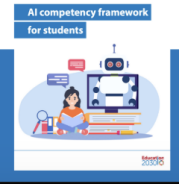
*Adapted from **UNESCO's AI COMPETENCY FRAMEWORK FOR STUDENTS (2024***
Poster by Stephen Taylor (@sjtylr).

***Source:** https://www.unesco.org/en/digital-education/ai-future-learning/guidance*



Thank you

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