# Gen-ZAI needs to re-learn studying







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## Al and the education of Gen Z: transforming tools into companions

#### Preliminary takeaways:

- In a competitive environment, students tend to behave as managers rather than learners: commanding AI for efficiency purposes rather than mastery. This causes 'cognitive offloading' of academic skills and impedes mastery learning.
- To counter this, it helps to reorient teaching strategies (promote mastery over efficiency) and testing (progress reward over outcome

reward). This also leads to better final product quality.

• Effective student mastery learning should resemble modern extended training of LLM's. This implies challenge students to themselves practice Chain of Thought (CoT); Reward Learning with Human Feedback (RLHF; in this case teachers & classmates) and AI Feedback (RLAIF).



#### Main research question

How can educators support today's students in using AI as a companion to (a) develop new learning skills and (b) effectively collaborate with AI in their future careers?

#### Methods

We integrated insights from educational and neurofunctional psychology on human motivational systems with the principles of large language model (LLM) pre-training, prompting, and operation. In a pilot study, we organized two 3-hour multidisciplinary AI hackathons to assess how novice users prompt AI. Insights from this informed the design of a 3-month interdisciplinary university Ba2 course at the end of 2024. Six teams of bachelor's students from diverse disciplines designed AI applications by employing and integrating their disciplinary knowledge. Course design rewarded progress in creative and formative processes (Kahneman's System 2 thinking) rather than final outcomes (e.g., a fully functioning app). We encouraged students to apply AI training principles to their own *human* learning style: using their human Chain of Thought (CoT) reasoning to instruct AI, Reinforcement Learning from Human Feedback (RLHF) by team interactions with red team roles, and Reinforcement Learning from AI Feedback (RLAIF) in furthering their projects.

#### **Key Insights**

- Cognitive offloading<sup>2</sup> tendencies prevail Students tend to approach AI from a production standpoint, persisting in prompting for outcomes rather than employing CoT type or stepwise instructions (system 2 level).
- **Spontaneous AI use is mixed** Half of our teams spontaneously targeted automating academic outcome tasks (e.g. offloading by having AI design their presentation), the other half on learning tools (e.g. a tool for dyslectic students, making learning materials more accessible).
- Encouraging a Learning Mindset is necessary throughout Special attention should be given to helping students remain in a 'learning' mode rather than shifting to a 'production' mindset when using AI tools.
- Problem-Solving Confidence needs special attention teachers should highlight progress success to maintain self-confidence in problem-solving in students working with AI to avoid shortcuts to production-mode and decreased motivation through repeated 'failure' in students.
- **Red teaming empowers (RLHF) progress** Productive collaboration between students and AI tools was greatly helped by assigning each team as a 'red team' to one of the others, with specific stakeholder roles

#### References

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(e.g. student, teacher, exam committee member, ethicist).

- Human-Human Interaction Students experienced that human interaction skills and interdisciplinary validation are key to adequately steer AI development and integration.
- Adapting Teaching Practices The above preliminary findings suggest that substantial adjustments to academic teaching methods and summative assessment may be necessary to support Generation ZAI's learning capabilities.

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- see student course evaluations

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