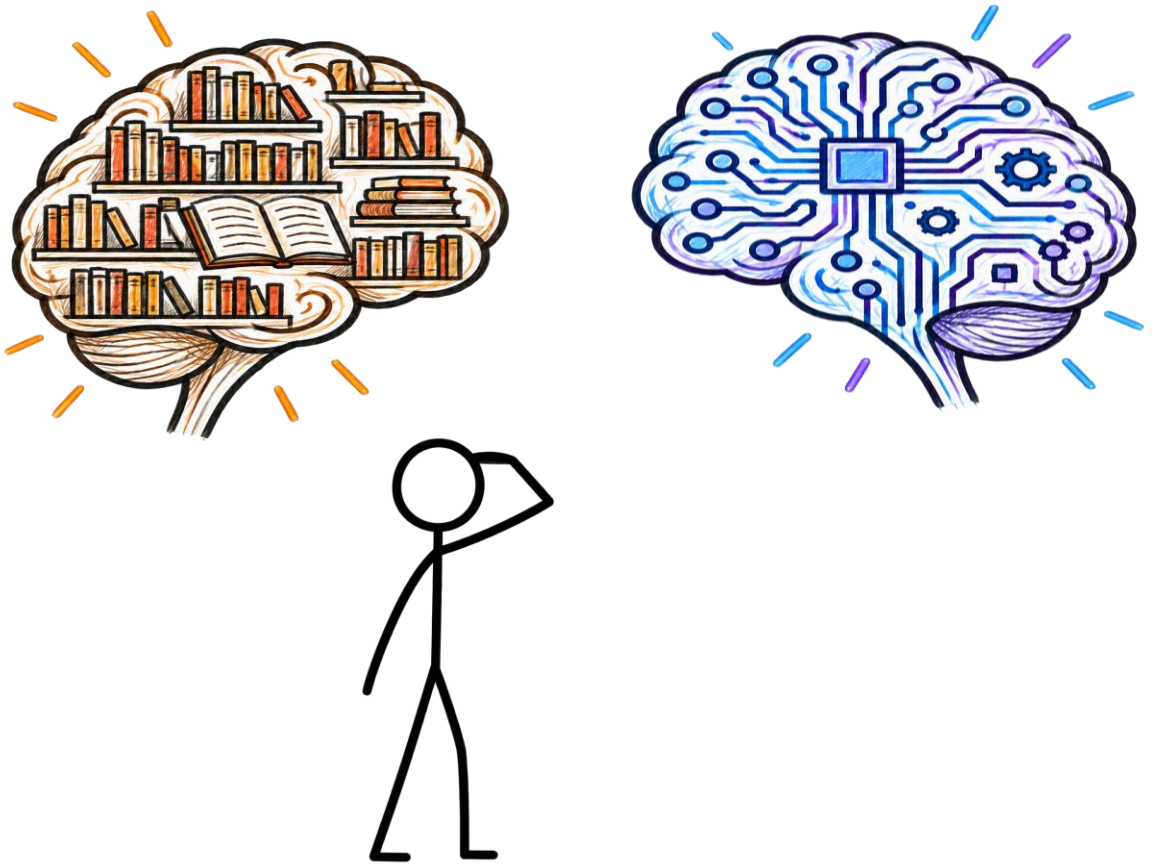
Welcome to TLC-FMG lunch seminars

- Interesting speakers on current topics
- TLC-FMG coaches are present for additional advice
- Every third Tuesday of the month
- From 12:00 to 13:00, lunch is included
- REC C0.03 (TLC-FMG space)



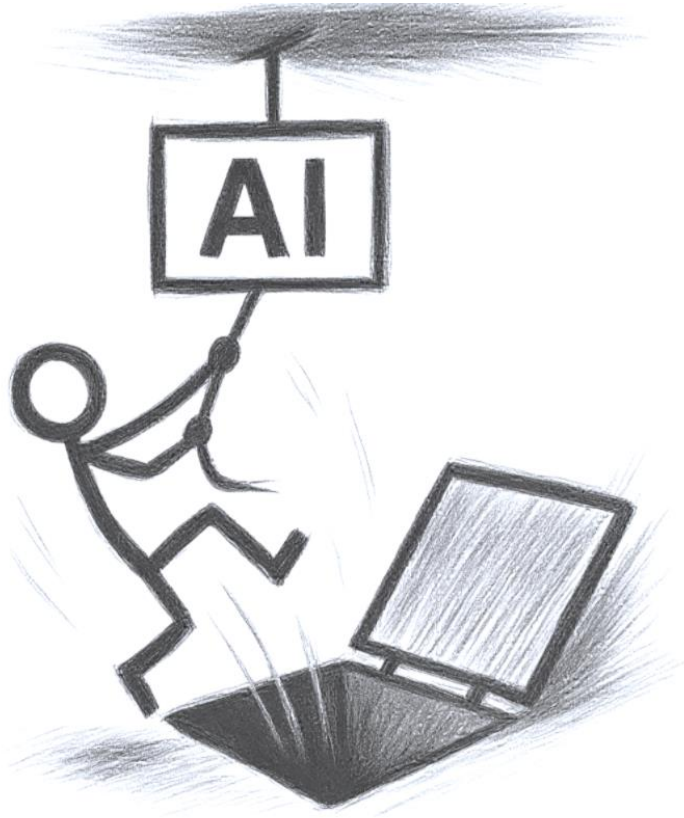
Smarter or dependent?
Effects of GenAI on Learning, Writing, and Thinking

by dr. Ivar Kolvoort



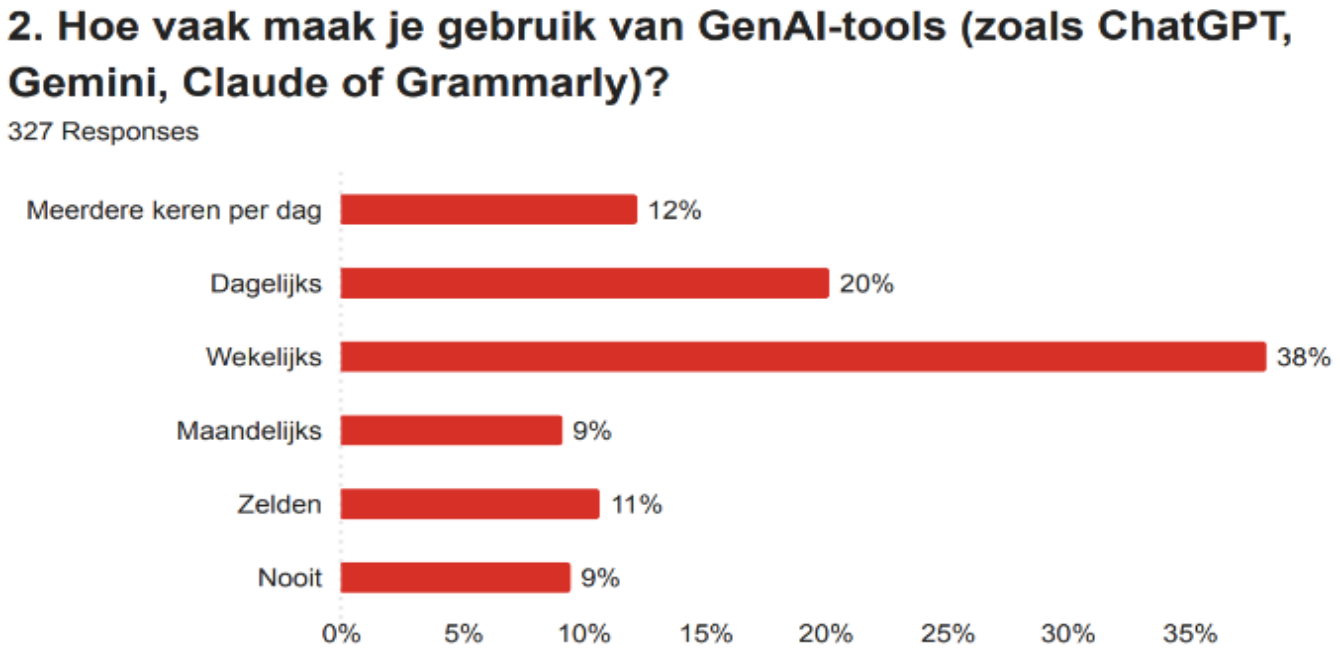
Smarter or dependent?
Effects of GenAI on Learning, Thinking, and Writing

1. **How students are using genAI**
    1. **Activity 1**: What AI use fits where?
2. **Process of academic work (Writing Pathways Model)**
3. **Effects of AI on learning: 3 Learning principles and AI Risks**



Broad, interdisciplinary approach focusing on writing and combining observations, theory and research

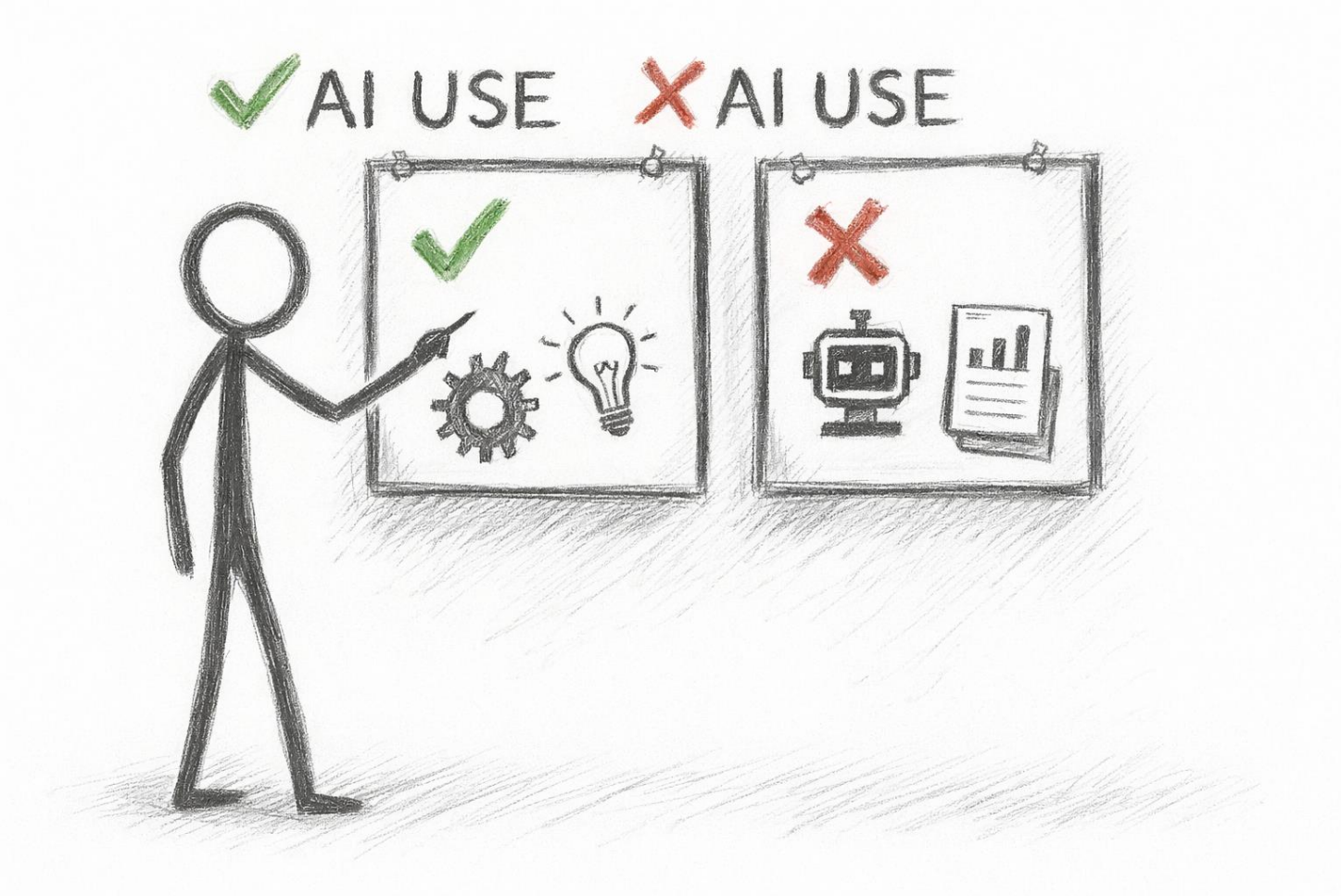
Do your students use AI?



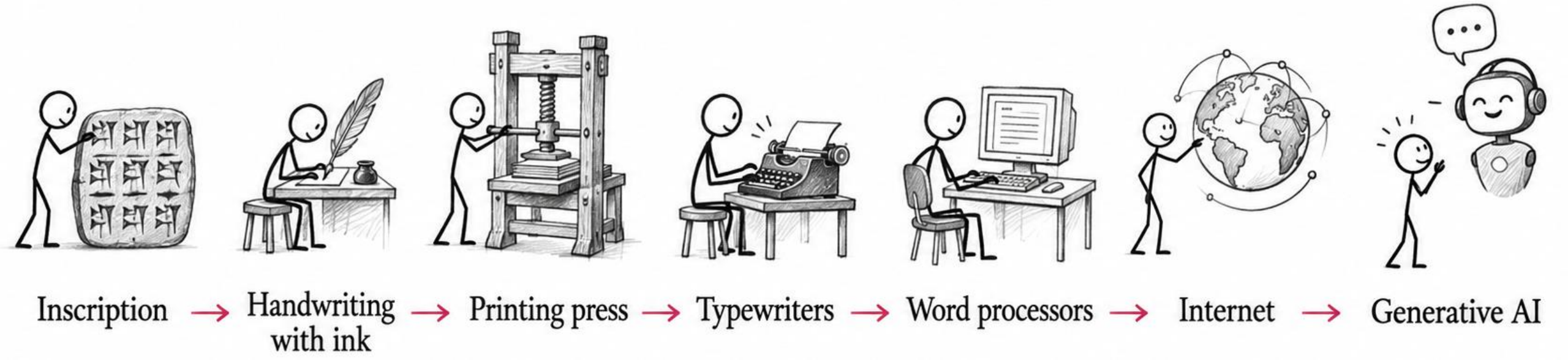
70%

of UvA students use AI weekly
UvA panel 2025

Is genAI making us smarter or more dependent?



Smarter **and** dependent!



AI will **change knowledge work, the organization of academic practices, and our relation to language** more generally, just like previous technologies did.

A lot is still uncertain, but not the fact that **education will play a large role** in shaping how AI will change us.

See "Network of Equipment" in work by Flores & Winograd

1

BLOCK ONE

What students actually do with GenAI

A spectrum of AI use

AI doing all the work ⟷ AI only as study help



Android Andy general strategy

1. **Upload as much context as possible** (assignment, syllabus, literature, rubric, etc) and tell AI to do assignment
2. **Go step-by-step** through assignment, **copy parts of assignment** that are not included in previous response by AI, tell AI to include
3. **Copy in rubric** and tell AI to adapt answer to score high on this rubric (multiple times)

This strategy is quite effective for getting good grades

A spectrum of AI use



Android Andy

AI doing all the work

AI only as study help



Motto: Collaborate with AI
They do work themselves, then have AI check and improve it. They also let AI do work, and they check and improve it themselves.
When the going gets tough, the AI gets going (and productive struggle is avoided)

<u>Example prompt:</u>
“Improve my introduction and let me know what you have improved. Also give me 3 examples I could use in the introduction.”

A spectrum of AI use



Android Andy

AI doing all the work



Hybrid Hugo

AI only as study help



Studious Suzy

Motto: AI helps me study

The student uses AI to explain difficult concepts, to help connect ideas, and to test her understanding with practice questions.

Friction and struggle are maintained.

Minimizing cognitive offloading

<u>Example prompt:</u>

“Why is variance reported with statistical tests and not standard deviation?

AI use itself does not determine learning

HOW AI is used determines whether it contributes to learning



Distinct modes of AI use as described by students

Based on findings in Dickinson & Marshall (2026) Trained to stop Learning? How students are experiencing assessment and learning in an age of AI. *Wonkhe*



Studious Suzy

Search Engine Sam

AI as search replacement



Scaffolding Sarah

AI organises thinking



Debugging Dave

AI checks work in real time





Android Andy

Tutor Tina

AI as an always-on tutor



Bridging Ben

AI fills knowledge gaps



Accelerating Amy

AI speeds up production



Shadow work



The assignment intends





Andy practises

Andy is learning — just not what the assignment intended.

Hold on to four things

1. Students **use AI in a wide variety of ways**; the spectrum is real, wide, and complex.
2. They **routinely switch** between usage modes, often driven by circumstance, not just disposition.
3. Which mode a student use regularly is **not determined by ability**.
4. **How they use it, not whether, is what matters for learning**.



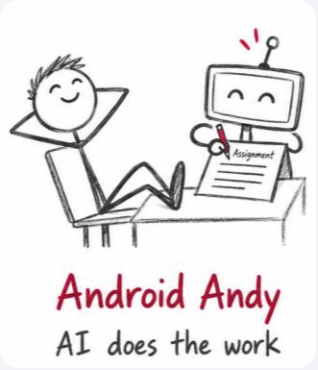
✦ ACTIVITY · IN PAIRS · 5 MINUTES

What do you think of these six student activities?

1. Asks AI for three possible structures for an essay, picks one, and explains in a footnote why they used that structure.
2. Pastes in a 400-word paragraph they wrote, asks for it to be made “more academic”, reads it carefully and submits the result almost unchanged.
3. Asks the AI to summarise four papers, then writes a comparison of their findings using the summaries without fully reading the papers.
4. Writes a first draft unaided, then asks AI for the three weakest points in the argument, and then rewrites those.
5. Reads a text and then immediately debates an interpretation of it with the AI, changes their mind, and uses their new interpretation for their essay.
6. Asks AI for the strongest counter-arguments to their own position, then makes sure to counter those in their essay.

For each activity, discuss two questions with the person next to you:

1 Where does this AI use fit?







2 Is this okay, given your intended learning outcomes?

Think of a course you teach.

Yes No

2

BLOCK TWO · 10 MINUTES

Academic work is not a pipeline

Before looking at the effects of genAI, we need a decent picture of what academic work is. We will use academic writing as our main example.

“

Becoming an expert writer “is a matter of learning to participate in some historically situated human activity that requires some kind(s) of writing; it cannot be learned apart from the problems, the habits, the activities — the subject matter — of some group that found the need to write in that way to solve a problem or carry on its activities.”

Russell (1993), p. 194

1. Writing is not a generic skill. 2. Writing is a social activity. 3. Context is everything.

Writing is situated, iterative, recursive, and dialogical

Situated:
Work happens within a discipline and its standards.

Iterative and recursive:
Drafting changes ideas. New ideas change drafts.



Interactive:
Writing involves texts, data, people, objections, and deadlines.

Dialogical:
We think with ourselves, peers, teachers, and the literature.

The same is true of coding, experiments, projects, and clinical arguments.

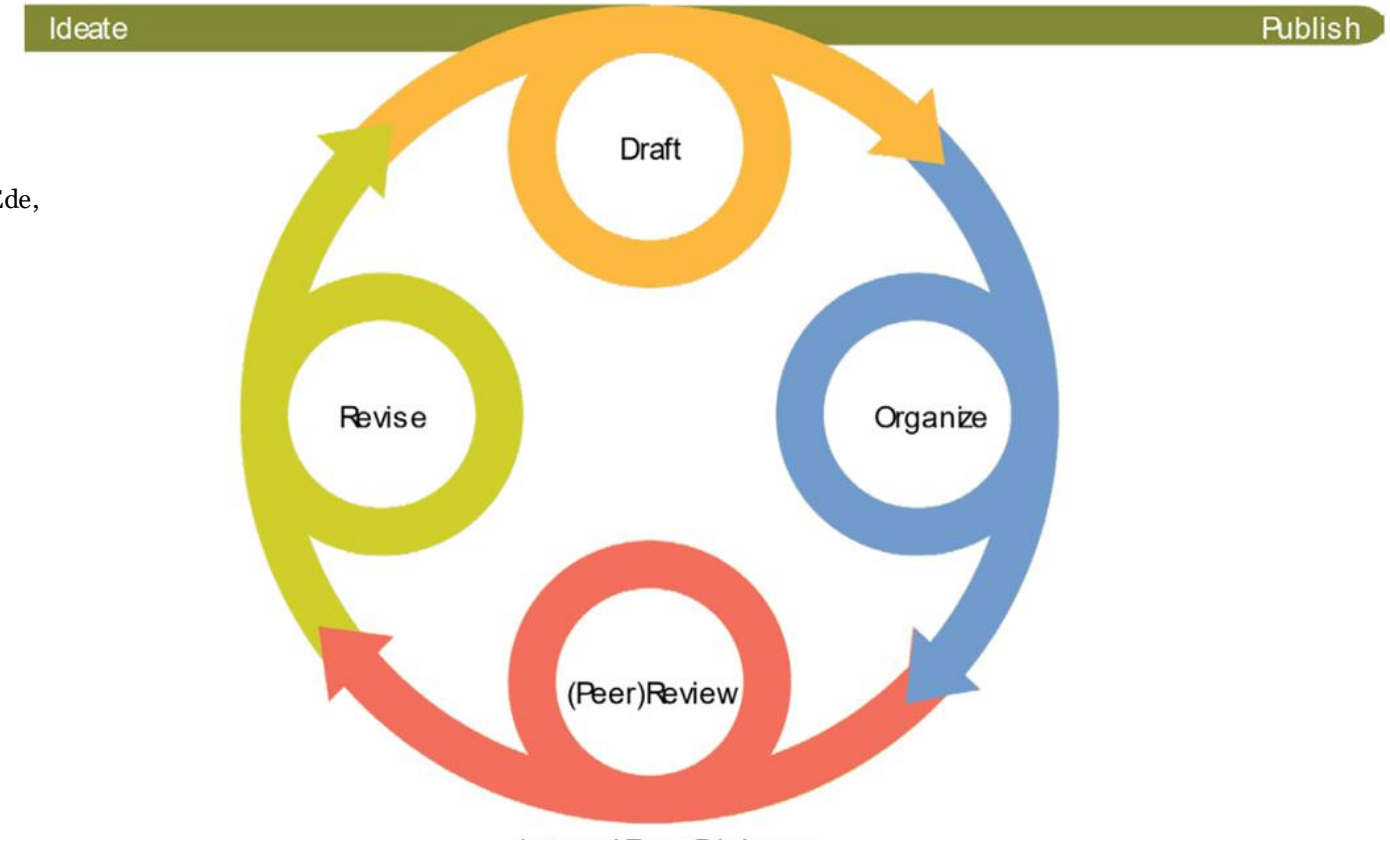
The process of academic work

Writing is a **situated, interactive, recursive, dialogical** process (Graham, 2024; Ede, 1994)

- Broad conception of 'dialogue': valuable interactions with oneself, ideas, peers, instructors, institutions, and practices

- Model uses four categories of prototypical writing activities, there exist more

- Other complex academic activities (coding, running experiments, project management, etc.) are similarly composed of a variety of recursive activities

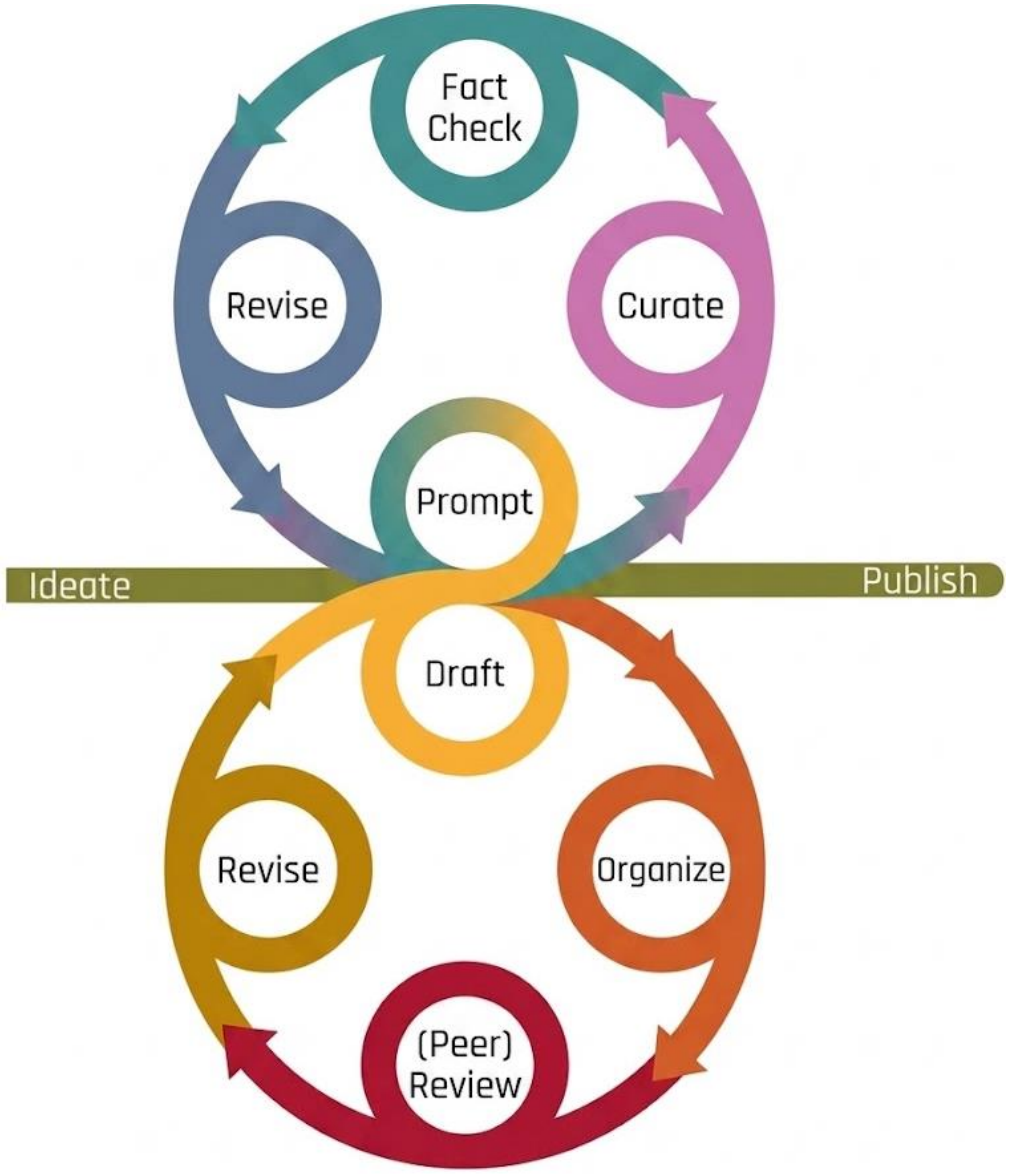


Internal/peer/instructor/institutional/social dialogue

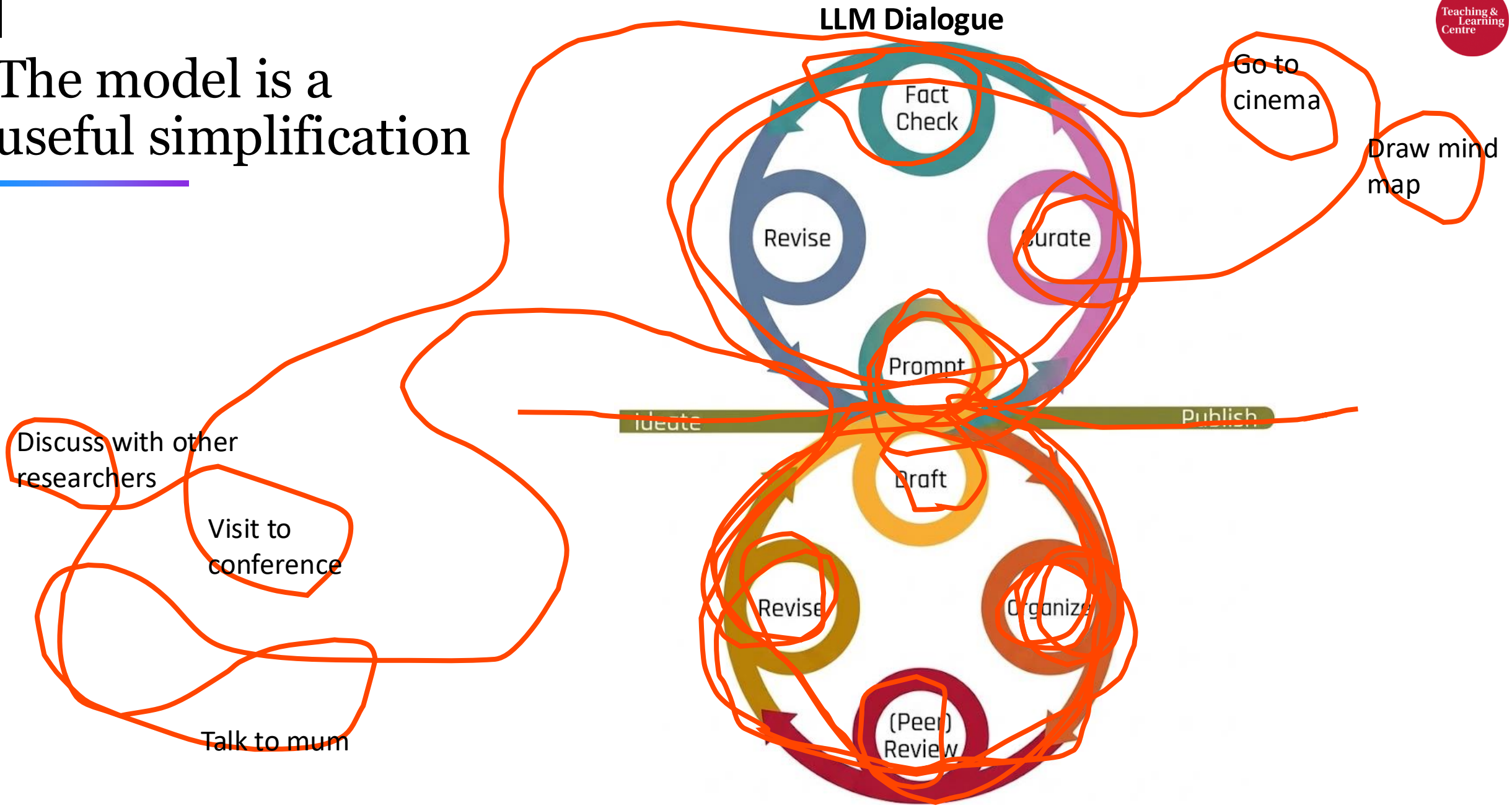
AI does not replace the process; it adds a loop

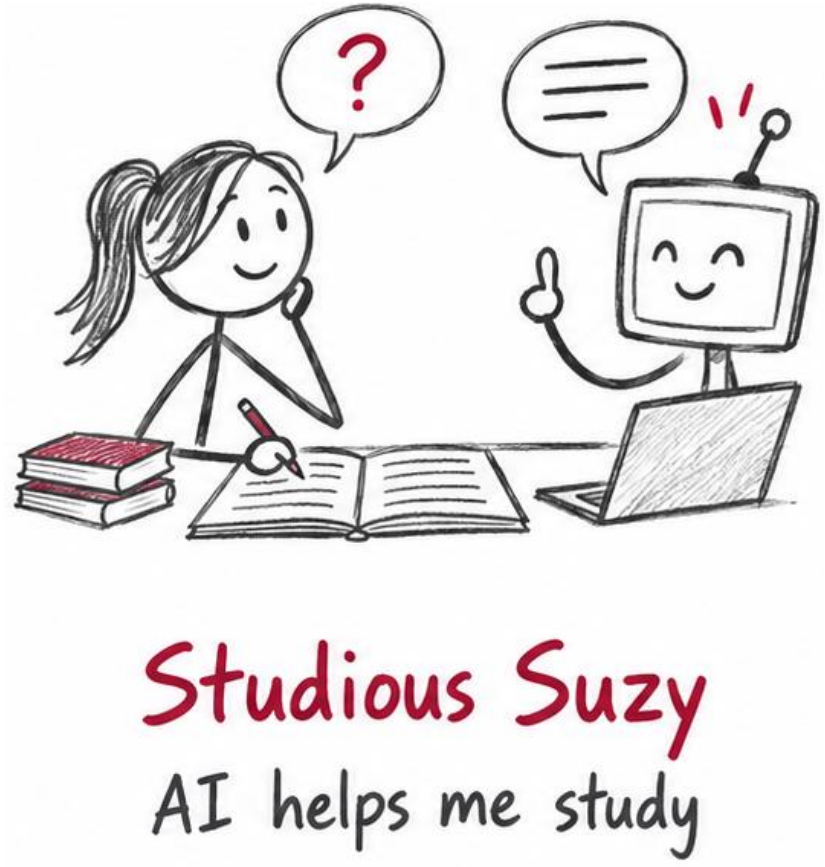
GenAI adds second loop of recurring activities

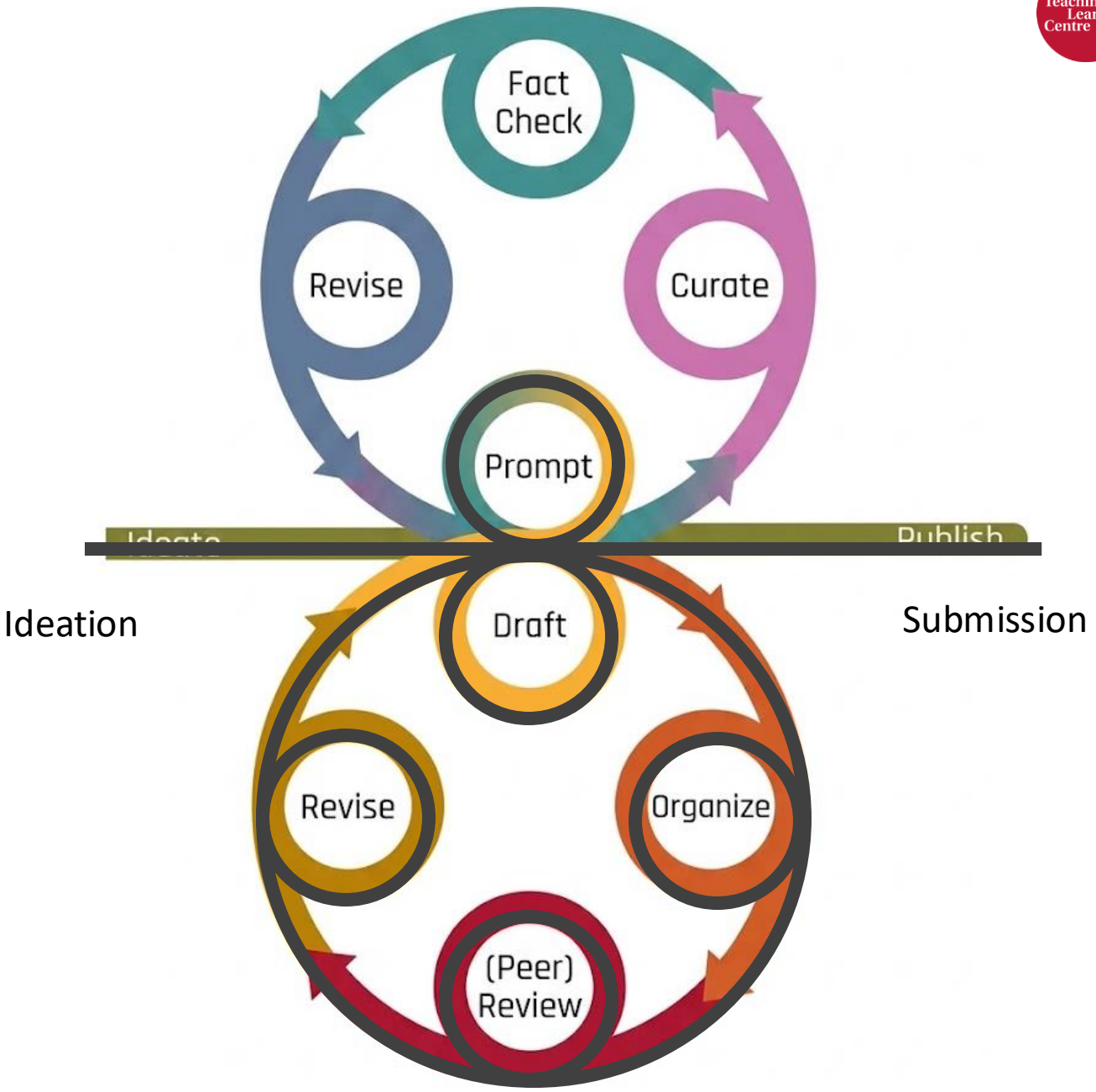
- Activities in the AI loop are not automatically bad.
- This creates many more different ways to get from an idea to submission: **different writing pathsways.**
- A writing path is the route a student actually takes through these loops: which activities, in what order, how many times.



The model is a useful simplification



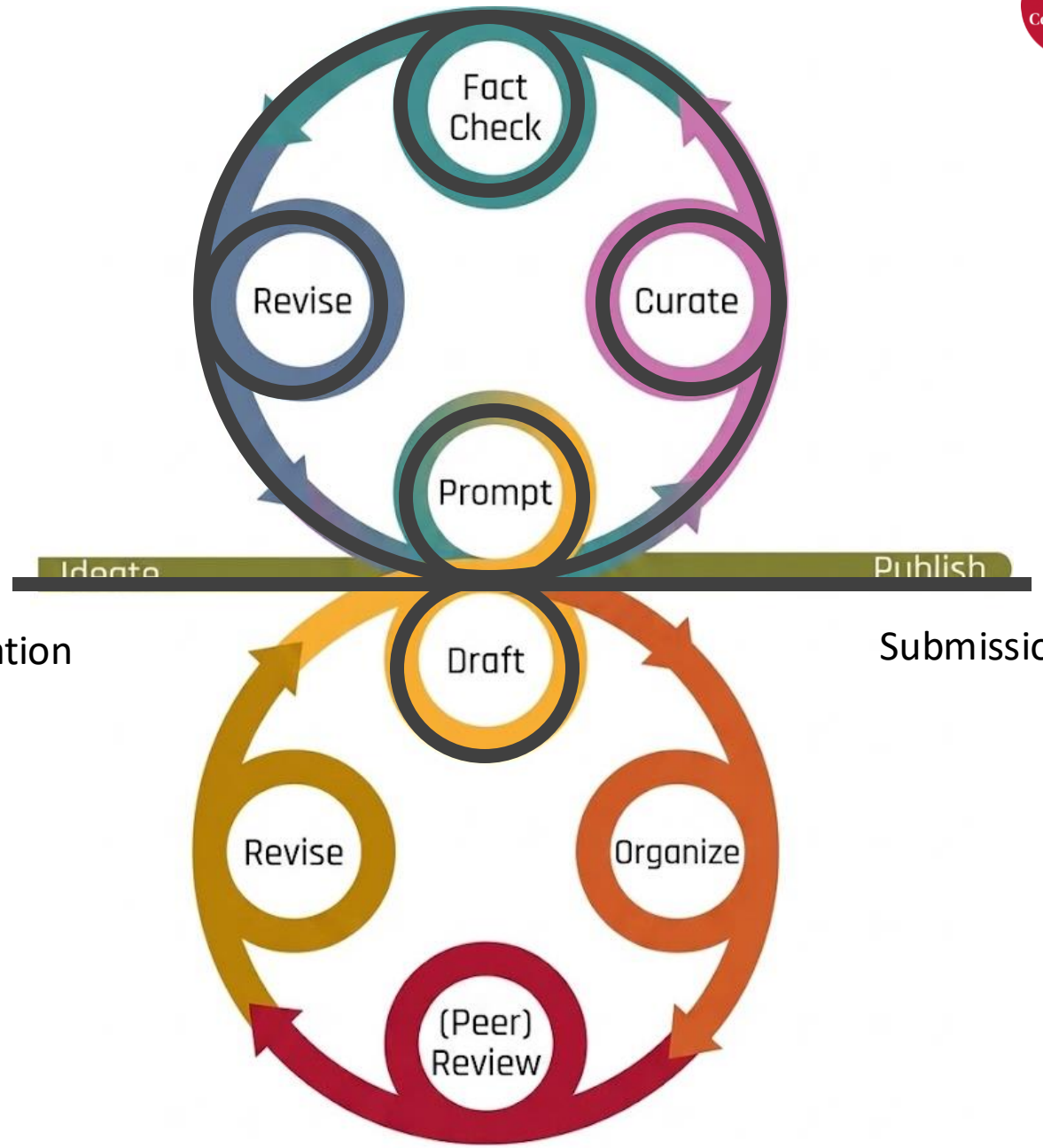

Studious Suzy
AI helps me study


Fact Check
Revise
Curate
Prompt
Ideate
Publish
Ideation
Submission
Draft
Revise
Organize
(Peer) Review



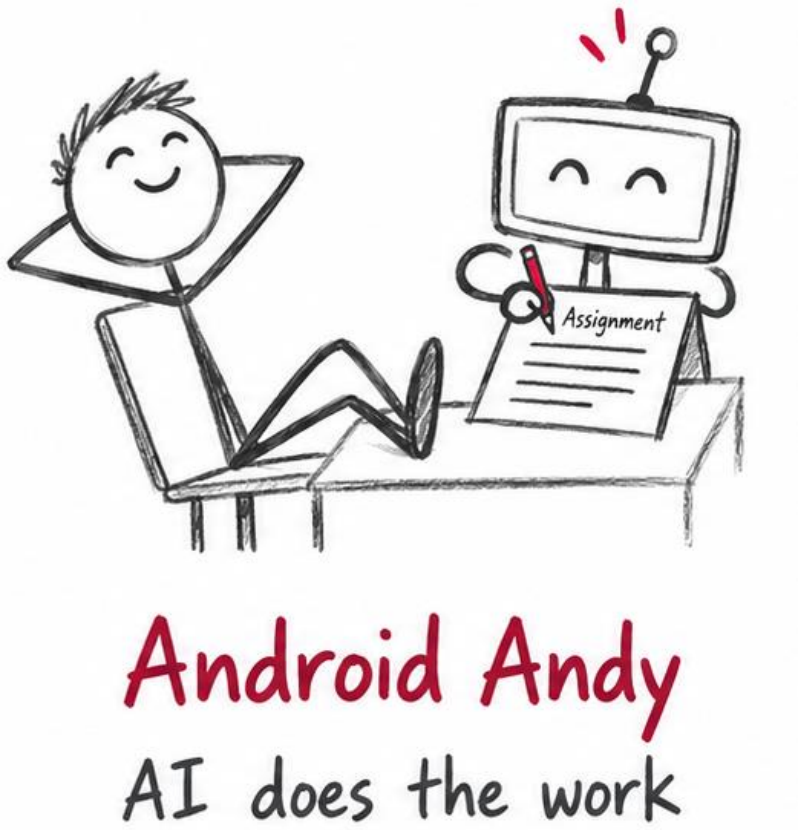
Hybrid Hugo

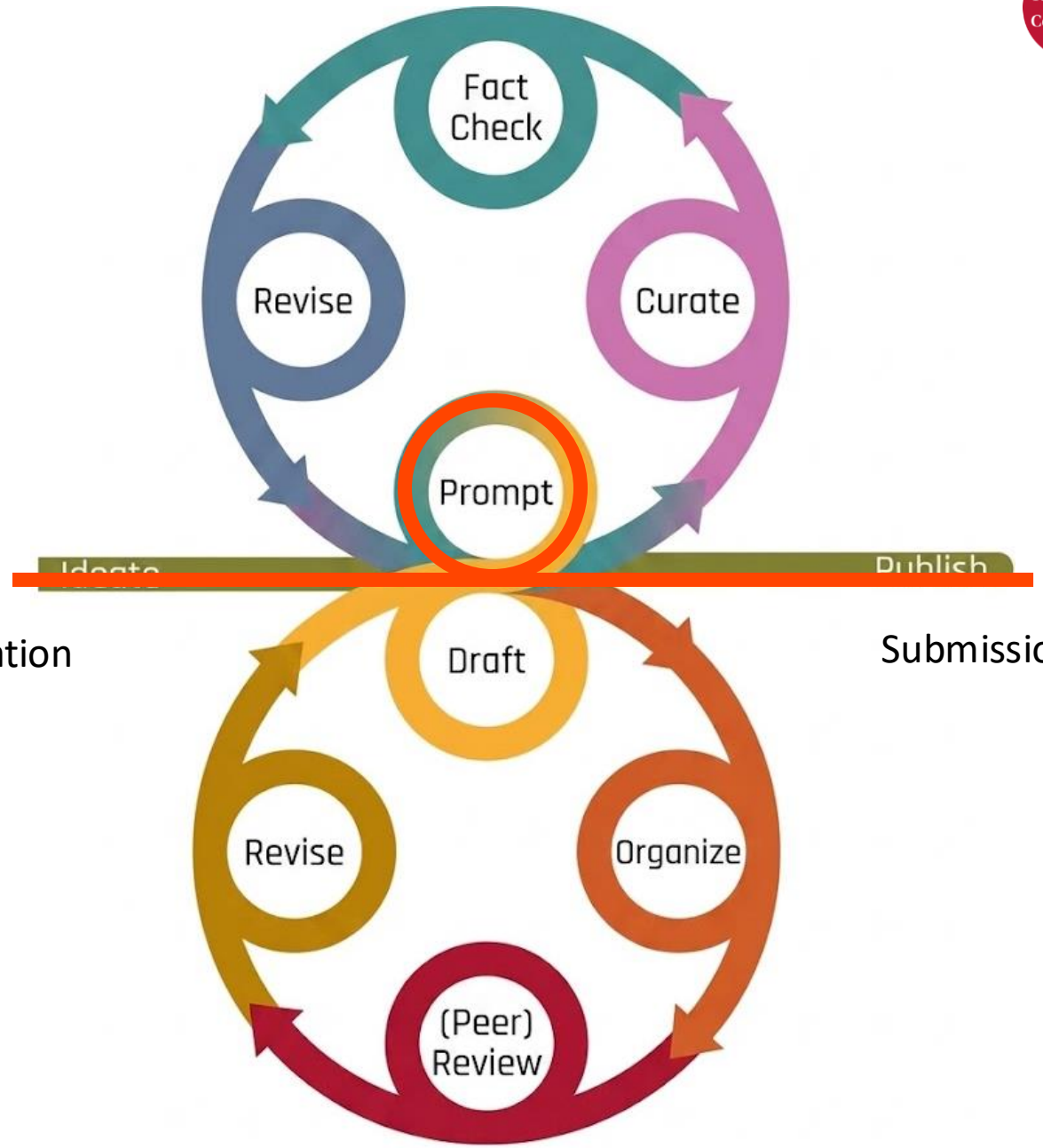
Student and AI both work



Ideation

Submission





Ideation

Submission

3

BLOCK THREE · 20 MINUTES

How people learn, and what AI can displace

Three principles from learning psychology, and the three associated risks introduced by genAI.

Three psychological principles of learning

1

We construct knowledge actively

Knowledge is built by working on something, not received ready-made. The effort of working through a difficulty, productive struggle, is part of how it gets built.

Constructivism

2

Best inside the Zone of Proximal Development (ZPD)

Learning happens in the gap between what you can do alone and what you cannot yet do even with help, reached through scaffolding.

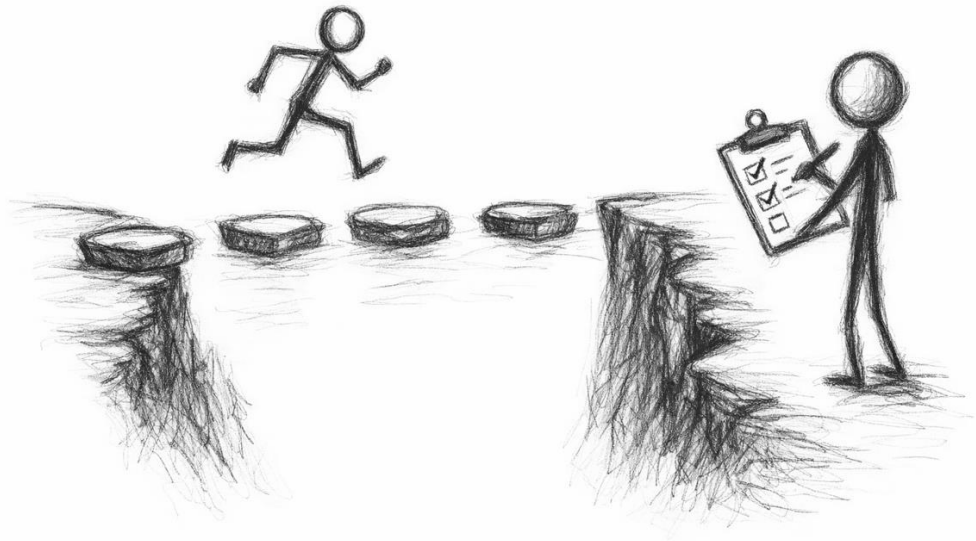
Vygotsky (1978)

3

Skill development: different needs from beginner to expert

Expertise needs deep, varied, unstructured engagement. You become an expert by being immersed in a practice, its problems, people, norms and texts. To the contrary, novices tend to benefit from following specific rules and working in constraints.

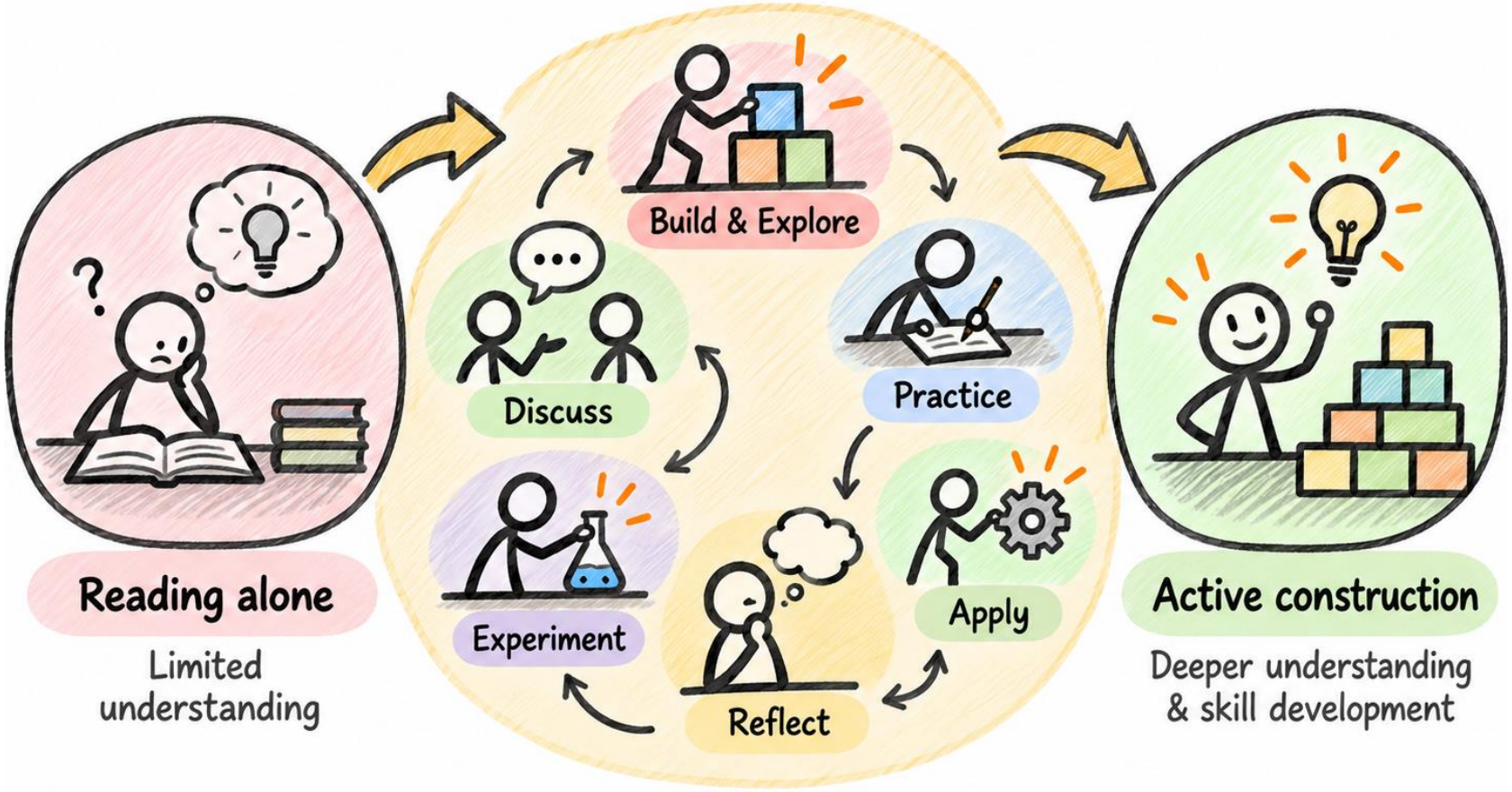
Dreyfus & Dreyfus (1980, 1988)



Each principle suggests one risk. Those three risks are the vocabulary for the next activity.

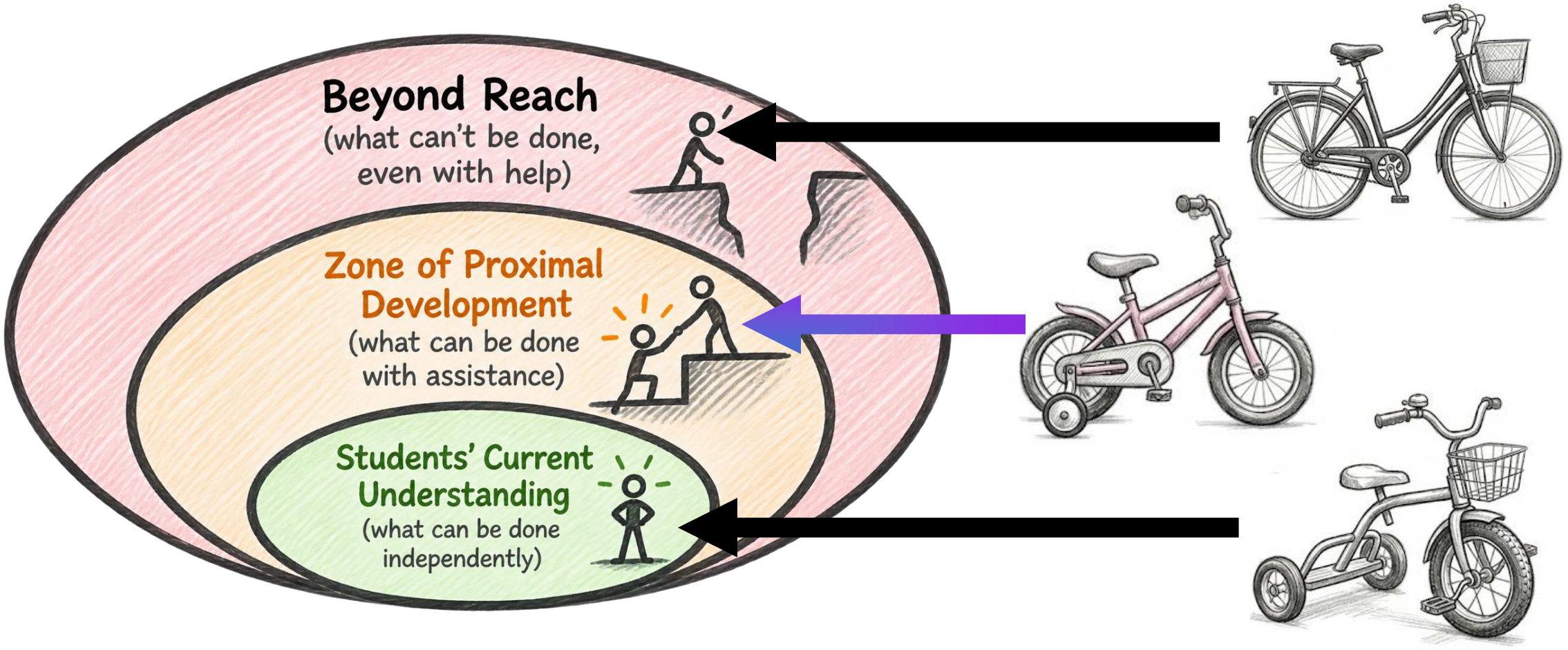
Learning principles 1: Constructivism

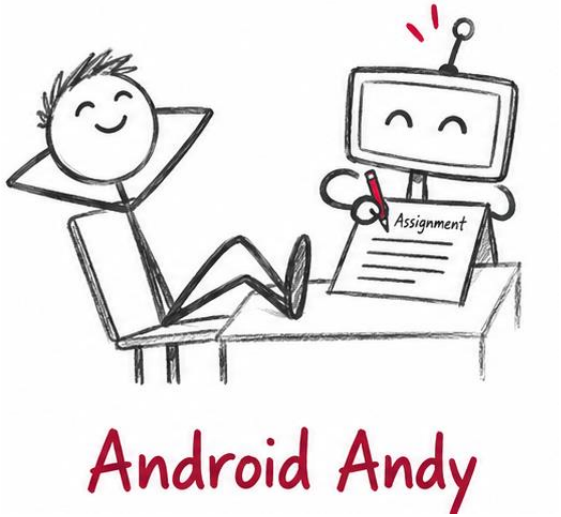
Students build knowledge and skills through active engagement



Learning principles 2: Scaffolding

Zone of Proximal Development (Vygotsky, 1978)



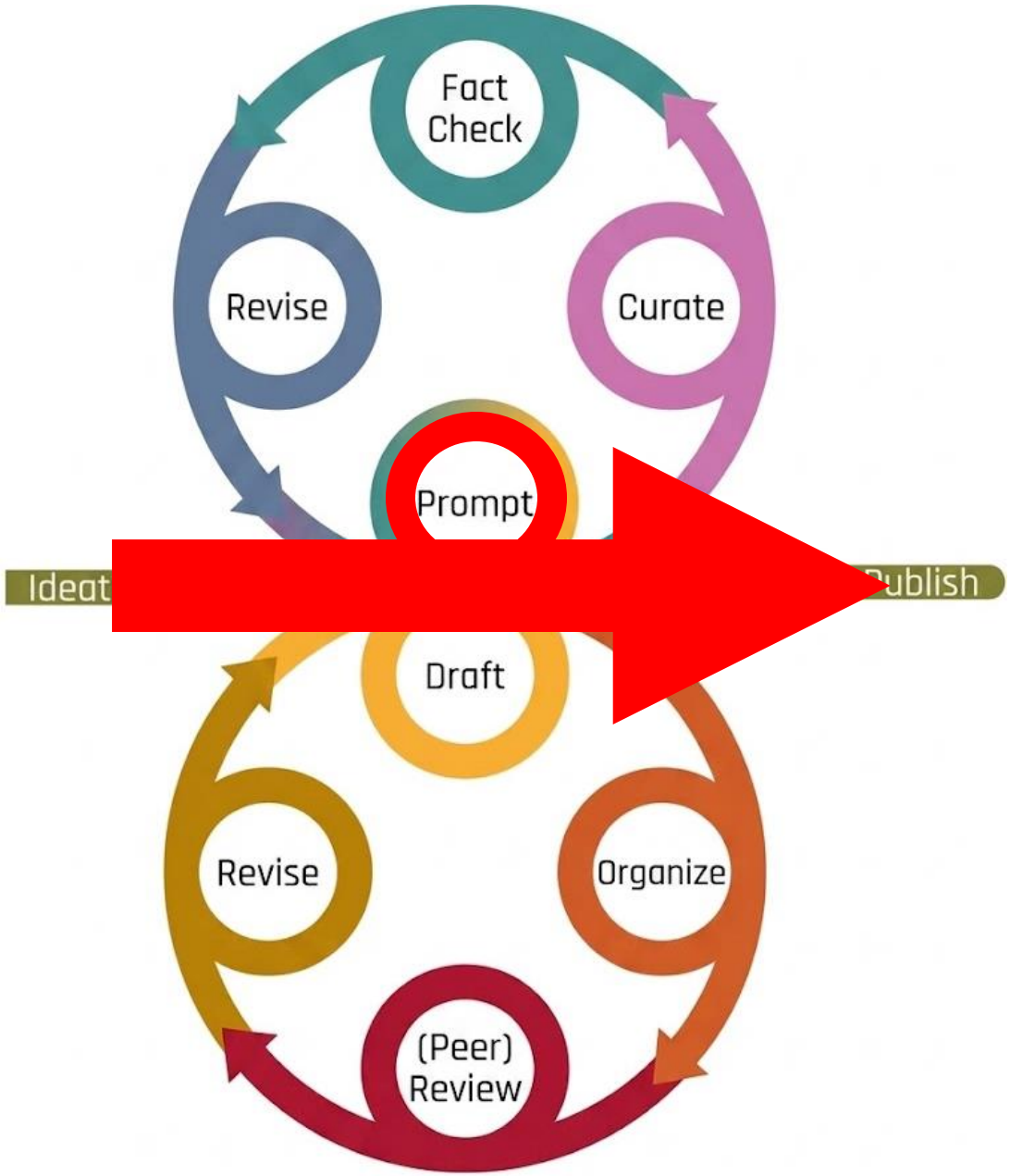


Cognitive outsourcing

The offloading of cognitive processes important to constructing knowledge & skill

Principle 1: constructivism

!





!

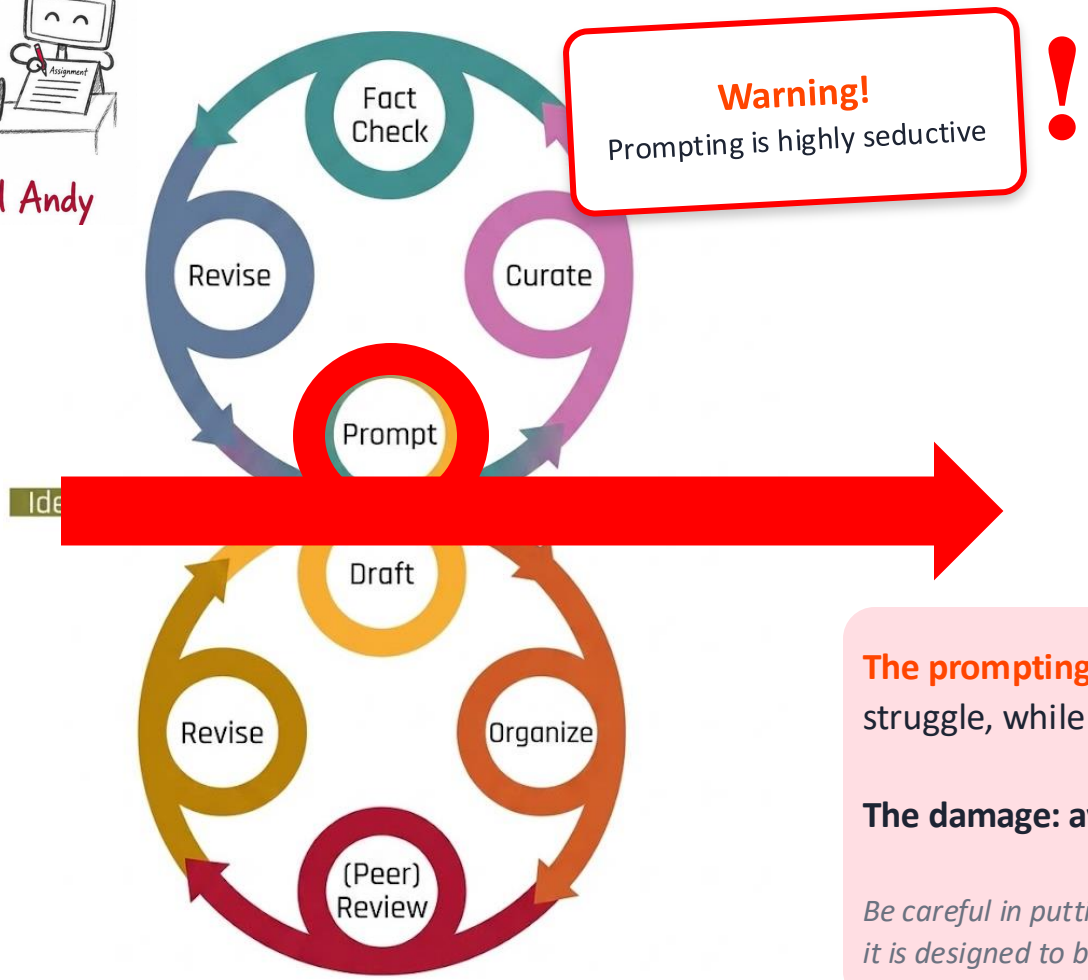
AI as bad scaffold

The AI output is often beyond the learner's level of understanding (beyond the ZPD) and possibly biased and wrong

Principle 2: scaffolding

Careful with blame: The prompting trap





Warning!
Prompting is highly seductive

AI tools are addictive

1 Easy to do

Almost no activation energy. Lower than opening the paper you were supposed to read.

2 Almost no friction

No confusion, no waiting, no risk of looking stupid in front of anyone. Often the next prompt is already suggested by the AI tool.

3 Unlimited novelty in return

Every prompt returns something new: Our brain loves this, dopamine galore. This is also how casinos get people addicted to gambling.

The prompting trap: getting stuck prompting repeatedly, avoiding every form of productive struggle, while acquiring the feeling that you could not have done it alone.

The damage: avoided learning opportunities and a feeling of incompetence.

Be careful in putting the blame on students. The technological environment is set up to work against them, it is designed to be addictive and distracting. Our educational context might not promote learning either.

Careful with projection: we might not be the right reference class

Cognitive outsourcing means offloading processes that form “valuable learning experiences”. Which ones are those, exactly?

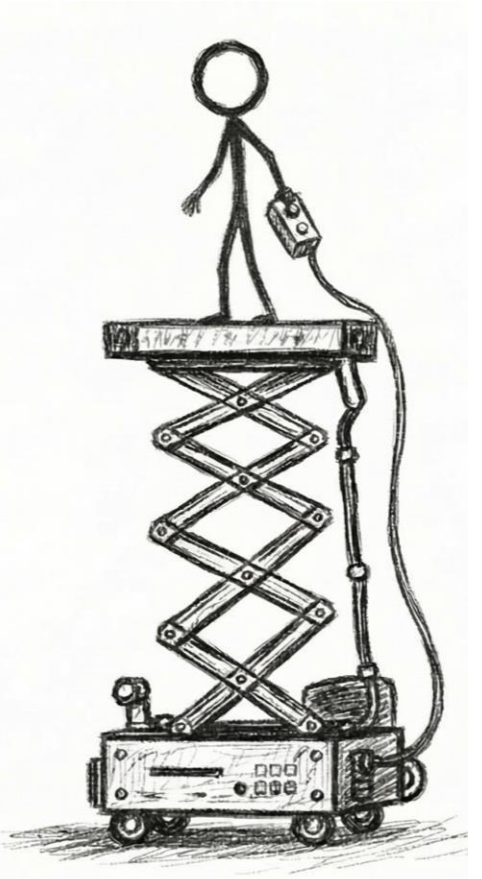


✦ **BIG QUESTION**

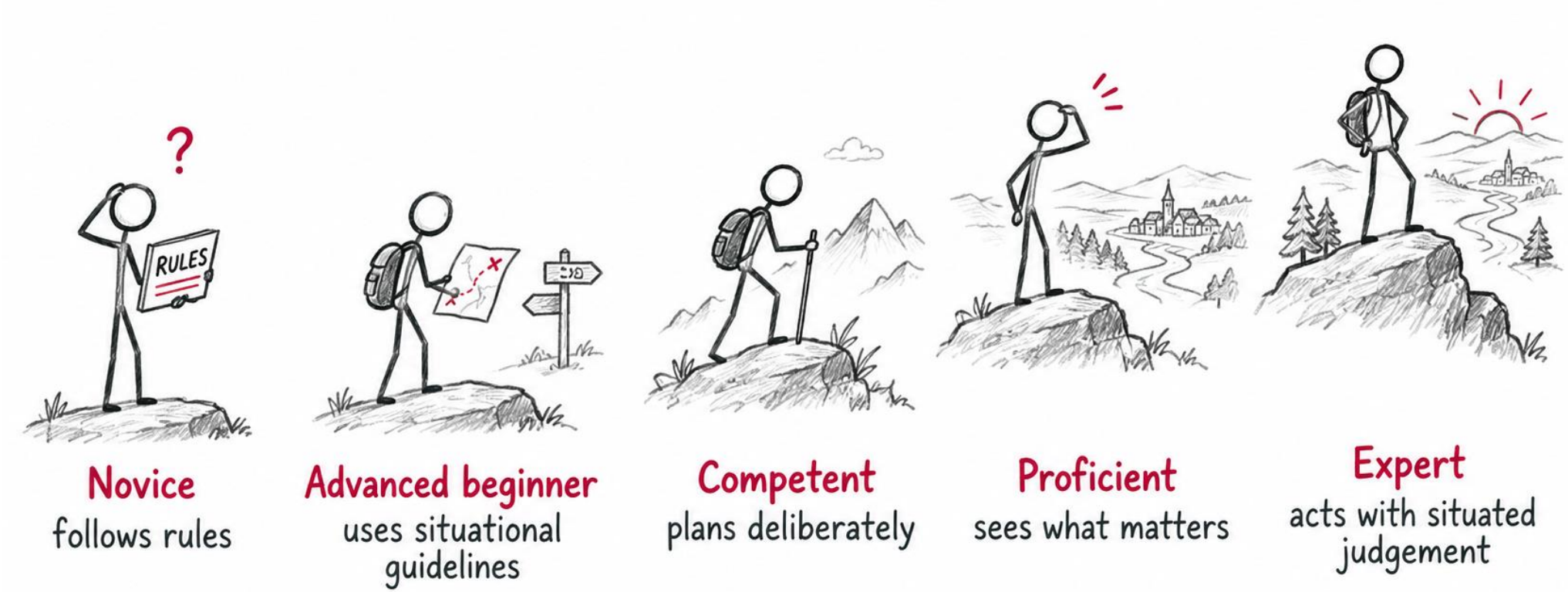
Can someone become an expert academic by learning to verify, judge, curate, edit, delegate and orchestrate? Or is manual drafting non-negotiable?

- ✦ **No empirical answer** yet to the Big Question
- ✦ We are **inclined to treat our own learning route as the only one** (projection)

That **inclination has been wrong** before: about calculators, computers, search engines, and even about writing itself (see Plato on writing). **But it has also been right**: some skills genuinely do not survive their tools. We just do not know exactly yet which ones and if they matter.



Learning principle 3: Novices need rules. Experts need exposure.



Learning principle 3: Novices need rules. Experts need exposure.

Skill develops through five stages, and what helps at one stage can hold you back at another.



NOVICES

Rules, worked examples and clear structure are what a learner uses to progress.

- Benefit from structured and constrained problems
- Rules can provide sufficient scaffolding

EXPERTS

Building expertise and honing skills by broad, varied, unstructured contact with the practice: its problems, people, texts, awkward cases and norms.

- Benefit from realistic problems and constraints, i.e. varied, complex, ill-structured and open-ended



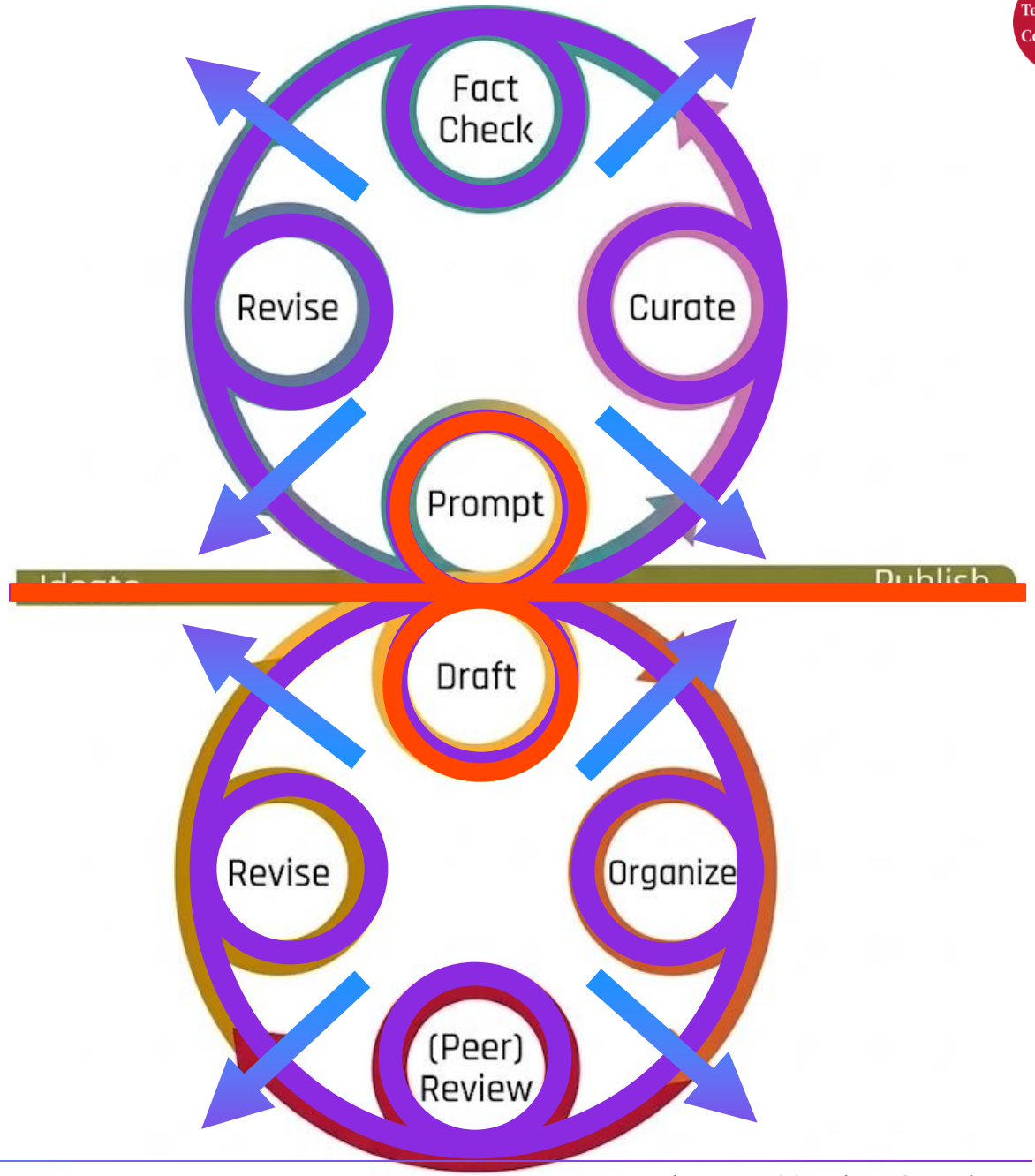
Risk 2 GenAI takes them **beyond the Zone of Proximal Development**; too little structure.

Risk 3 GenAI could **constrain their interactions and limit their exposure**, if AI use substitutes other activities.

From novices to experts

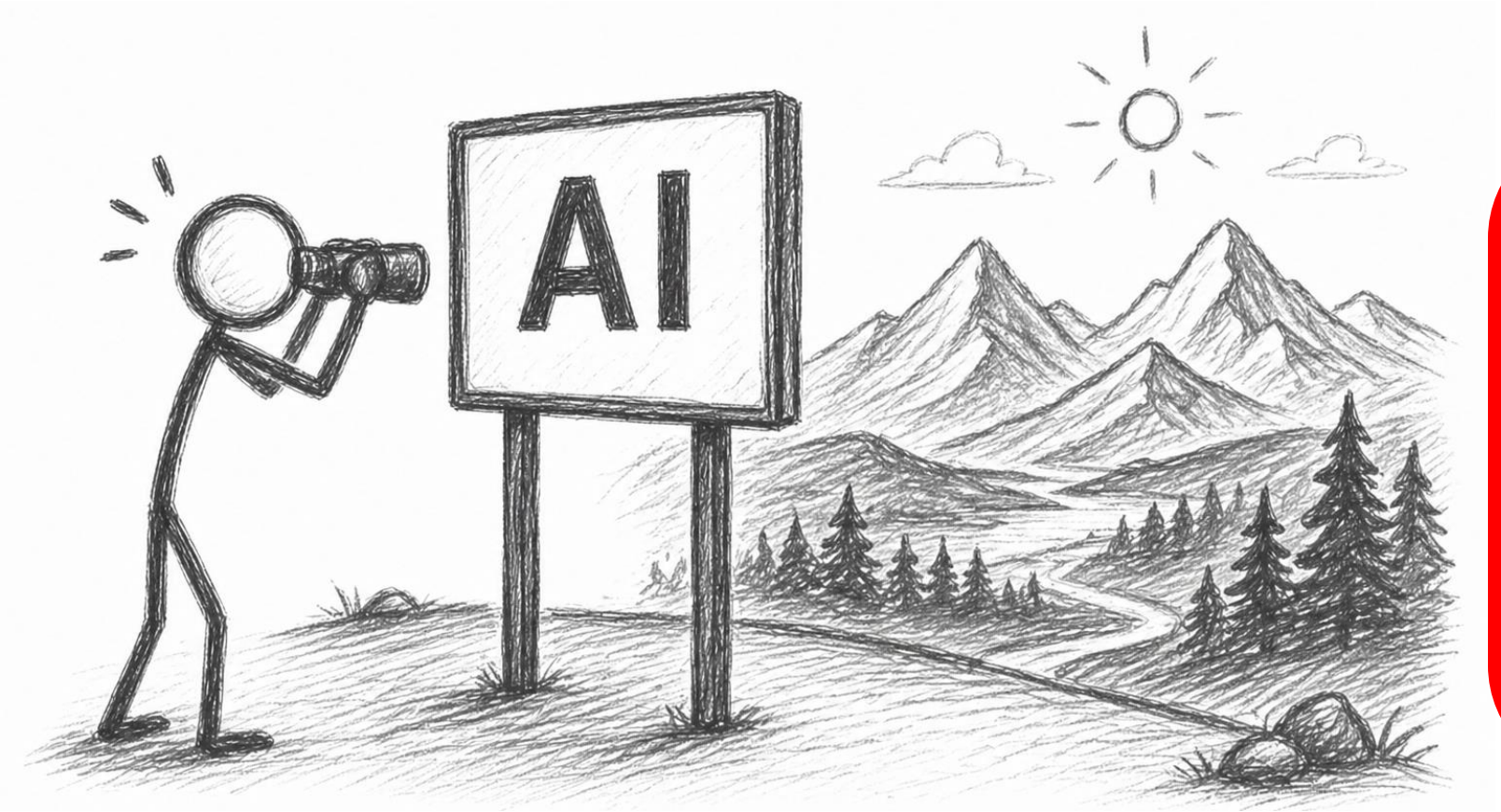
what we need to become experts





A constrained writing path: fewer and less varied interactions engagements with the richness of your discipline.

Shallow engagement at most.

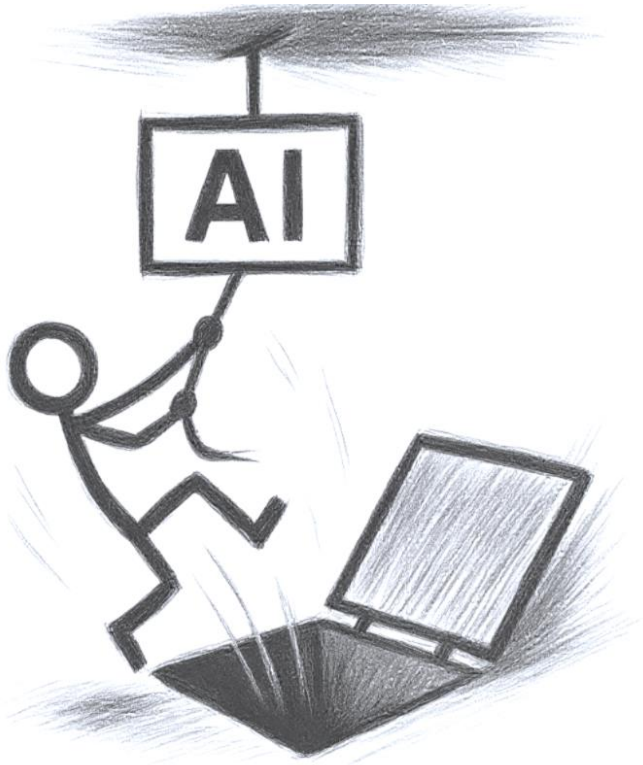


Danger of using AI as a "window into the world"

Generative AI provides us with a **severely limited and biased representation** of the world, **which will be inherited** if all engagement with an academic field (or the world at large) is routed through it.

Principle 3: Novices need structure, experts need exposure

3 learning principles, 3 risks of AI use



1

Learning principle: We actively construct knowledge by interacting with our environment

Risk: Cognitive outsourcing

The productive struggle through which knowledge gets built is handed over. The work gets done; that part of the learning does not happen.

2

Learning principle: This happens most effectively within the ZPD, using scaffolding

Risk: A scaffold that does not fit

Output arrives finished and at its own level, often past the student's ZPD and sometimes biased or wrong. A scaffold you cannot yet judge is not doing the job of a scaffold.

3

Learning principle: Novices need structure, experts need exposure

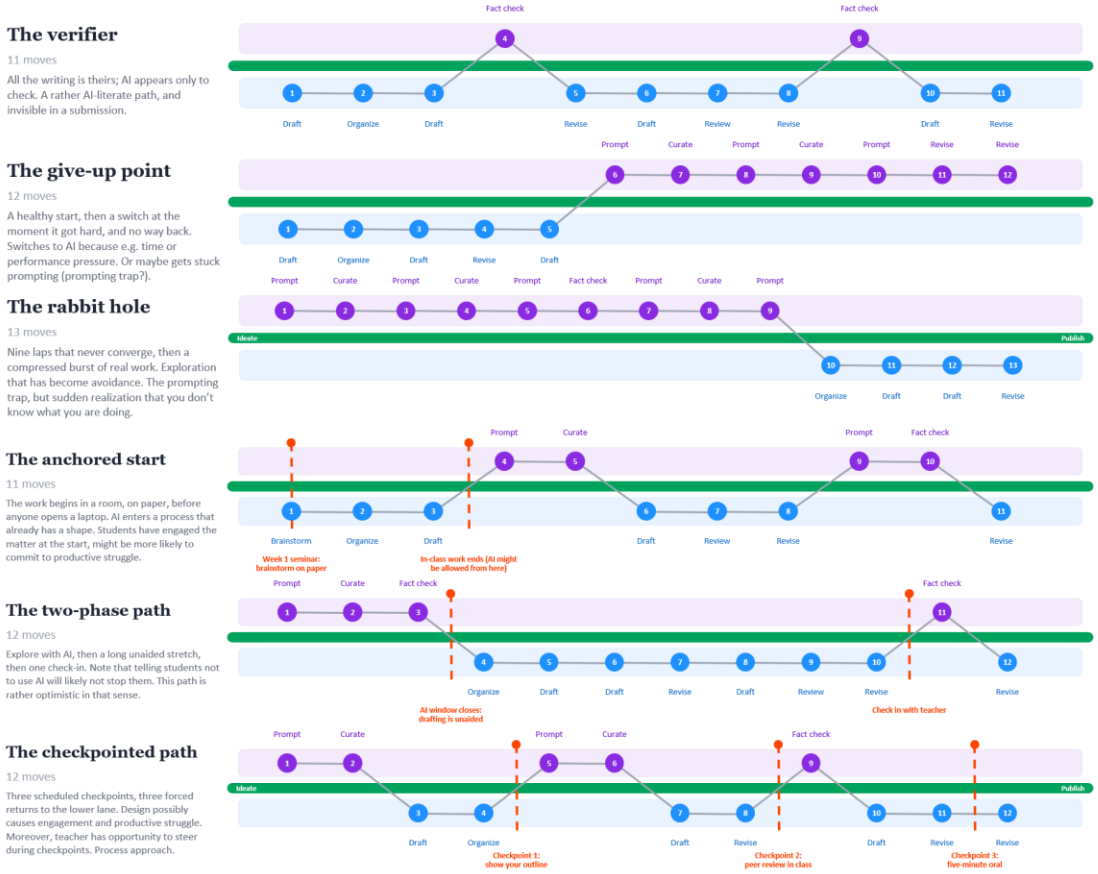
Risk: A narrowed window on the discipline

AI as a "window into the world": one flattened, confident representation. Route most of your contact through the model and you inherit its biases and limitations, foregoing the richness of the world.

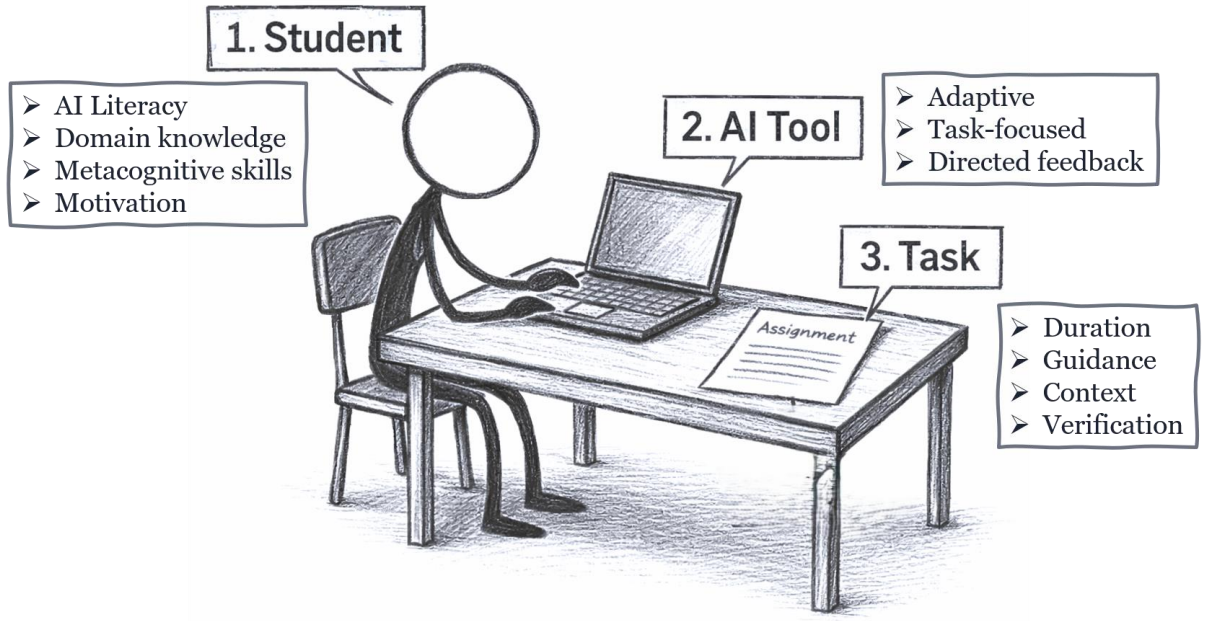
None of the three is about cheating. All three can happen with a student acting in perfectly good faith, they are design questions rather than integrity ones.

Maybe next time?

Student Writing Pathway analysis



Empirical research overview: factors that shape AI's role in learning



tlc.uva.nl/ailab

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Directly applicable for education

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Including programmes for curriculum level

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RELATED TO TODAY

Smarter or dependent?

What AI does to learning, thinking and writing. The writing path canvas, the three risks, cognitive posture.

ALSO AVAILABLE

Students and AI

Who your students actually are: the modes, the personas, the Dreyfus stages, and what changes between first year and master's.

ALSO AVAILABLE

AI in the Classroom

Building things: constrained assistants, in-class activities, and the practical side of the eleven levers.

ALSO AVAILABLE

AI & Assessment (1 & 2)

What all of this means for what you assess, how you weight it, and what the regulations allow.

ALSO AVAILABLE

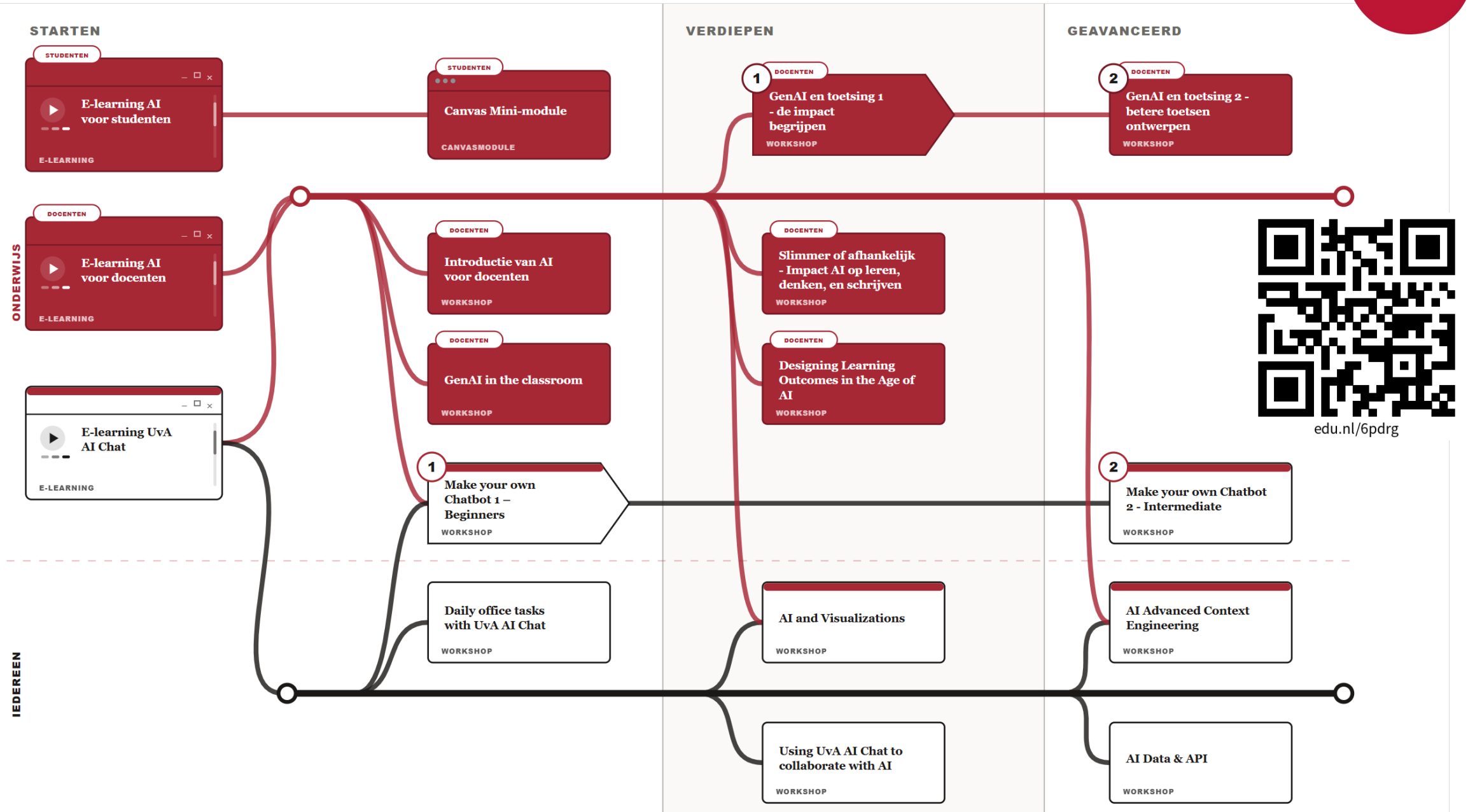
Learning outcomes and AI

Your intended learning outcomes in a world with AI: what students should be able to do, with and without it, and how to write that down.

Anything today that felt unfinished, how to build the assistant, what to do about the exam board, what a first-year can be expected to catch, is unfinished on purpose. It has a session of its own.

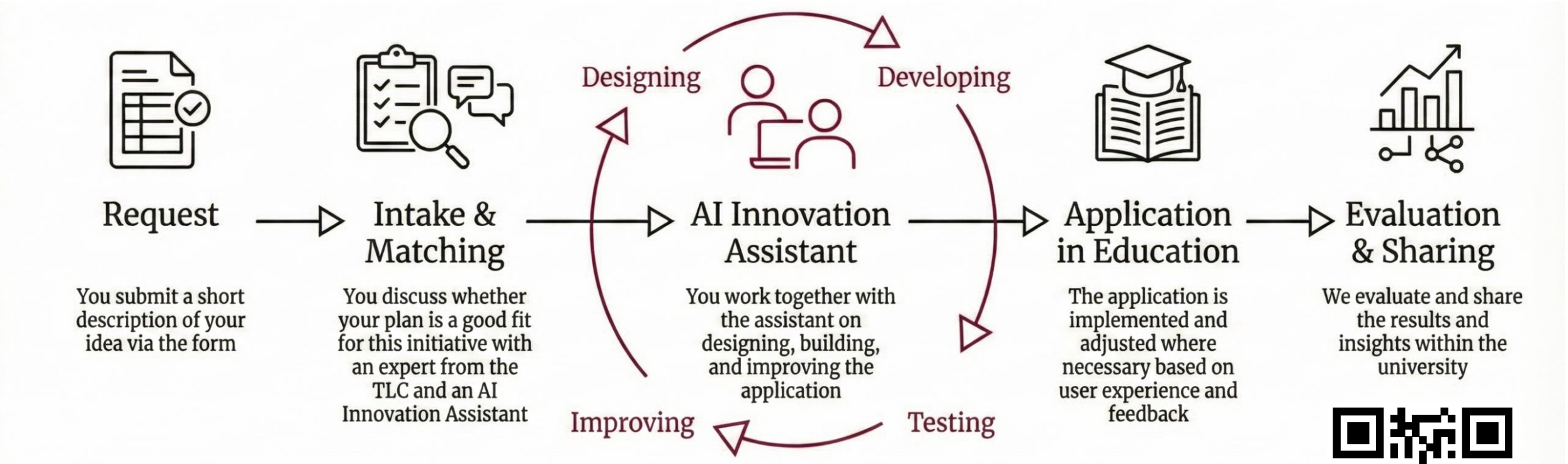
Living Lab AI cursussen docenten

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Next lunch seminar

- **Scheduling for Scholars: The Art of Not Working All the Time by Kees Smeets**
- **Tuesday 17 November 12:00-13:00**
- **REC C0.03 (TLC-FMG space)**

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Evaluation form

- Help shape future editions: Scan the QR code!