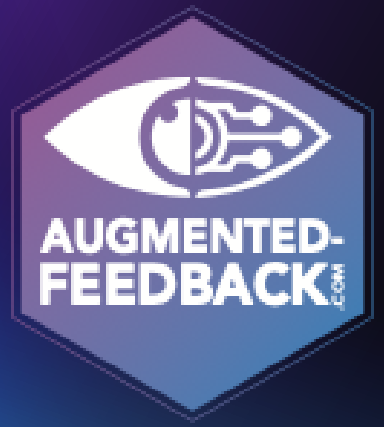
Learning worth the effort —
Rethinking engagement, practice, and feedback in the age of AI





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German University of Digital Science

What learning is still worth the effort?

- In times in which Generative AI can do almost everything
  - What is left for teachers to teach?
    - Or better: What of the old educational teaching and assessment practices continue to make sense right now?
- Learning needs friction: ”desirable difficulties”
- What does "engagement" mean in the age of AI”



German UDS – a new fully digital university

German University of Digital Science

- Students from over 20 countries
- Faces various challenges:
  - Time zone differences and connectivity
  - Evaluation and exams
- **Our solutions:**
  - **MOOC-style teaching**
  - **Virtual Campus**
  - **Alternative assessment**
- How do we ensure engaging learning?



Roles of education according to G. Biesta

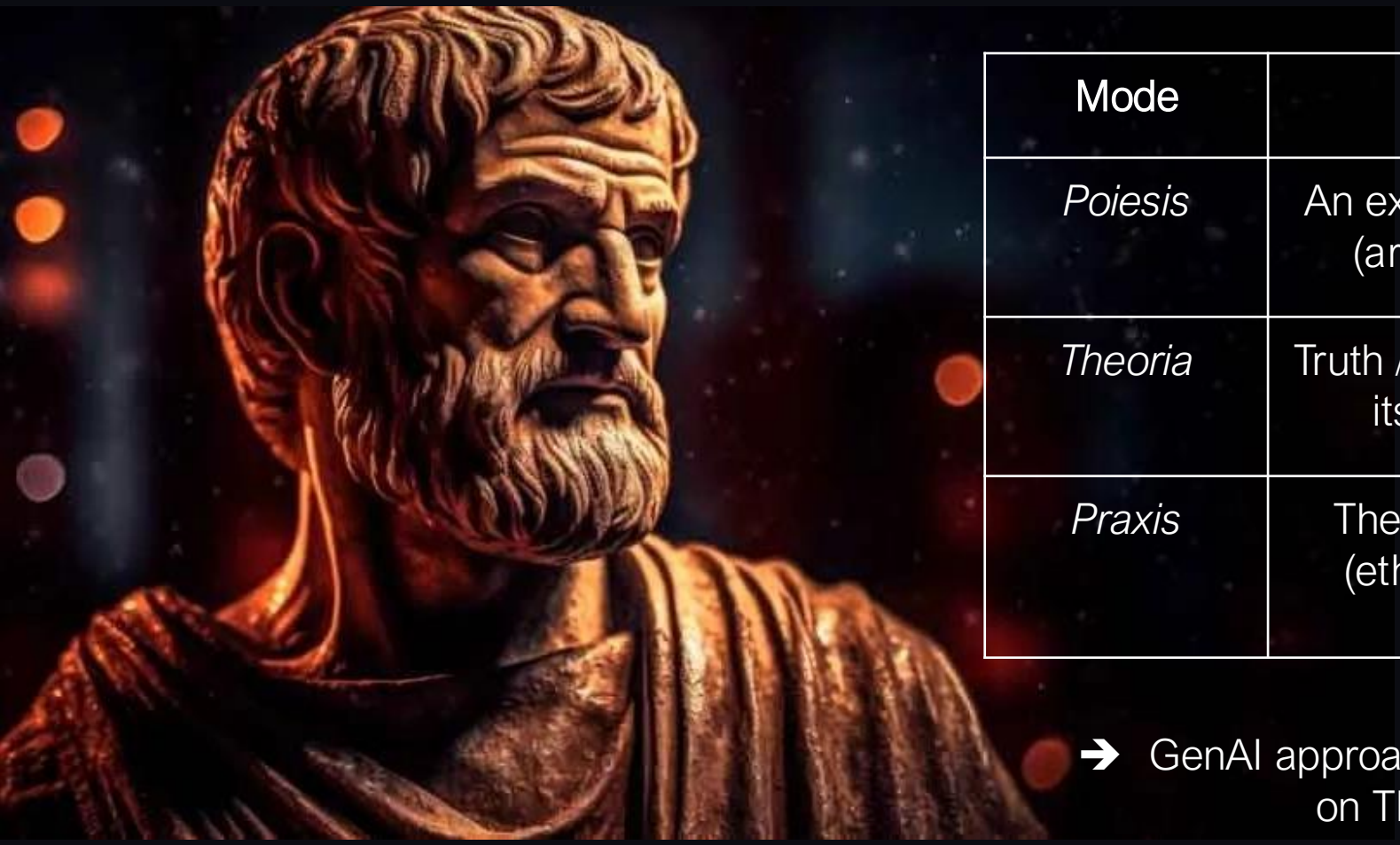
Cited by F. Balzan in his thesis



Gert Biesta



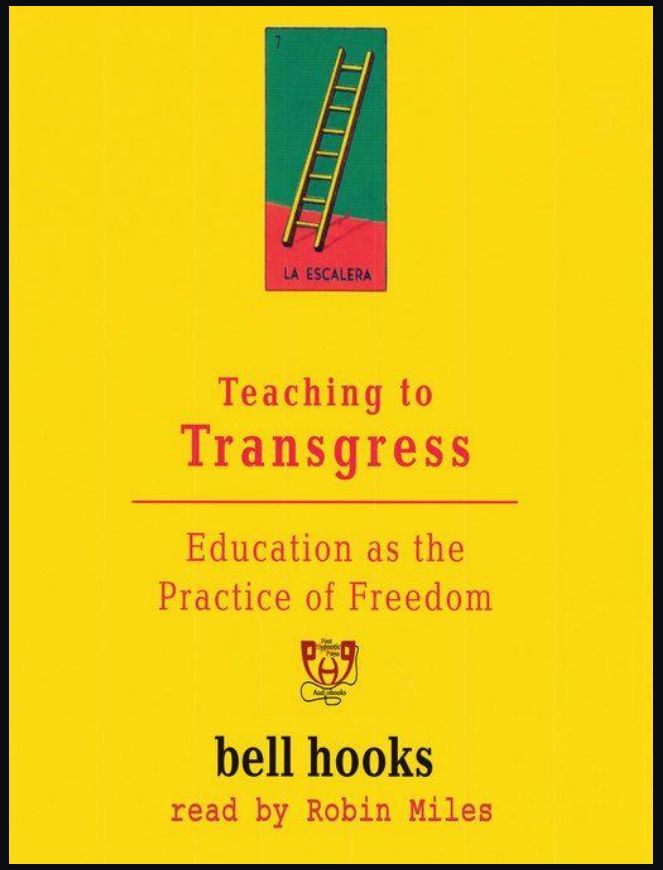
Aristotelian triad of human activity



Mode	End	Governing virtue
Poiesis	An external product (artifact, work)	Techne (craft / art)
Theoria	Truth / knowledge for its own sake	Sophia (theoretical wisdom)
Praxis	The activity itself (ethical/political conduct)	Phronesis (practical wisdom)

➔ GenAI approaches focus mostly on Poiesis, less on Theory, not at all on Praxis

bell hooks' "Engaged pedagogy"

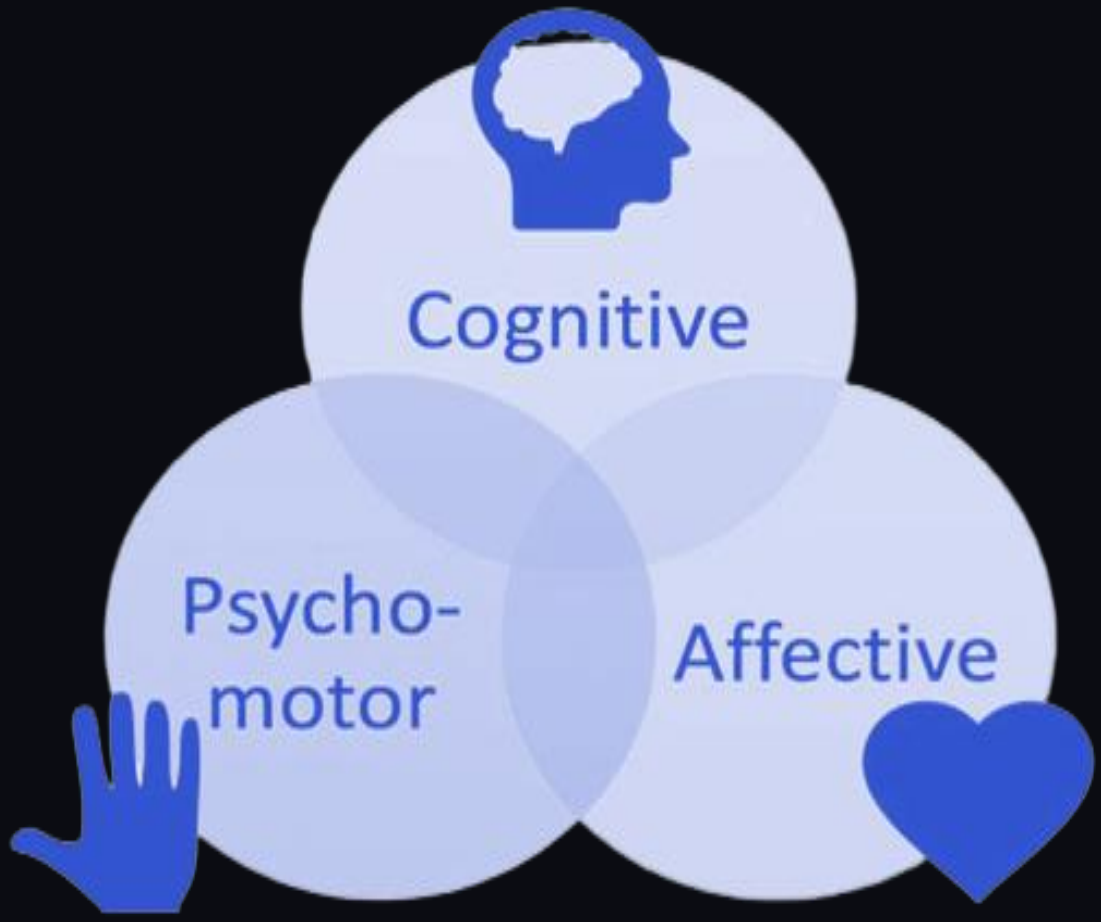


- Engagement is not entertainment:
  - should encourage students to think, questions, make meaning
- Mutual engagement, well being, critical consciousness
- revisits Freire and Thich Nhat Hanh
  - union of mind, body, and spirit
  - teacher should direct attention inwards
  - idea of a mind/body split, promotes compartmentalisation



bell hooks

Bloom’s domains of learning

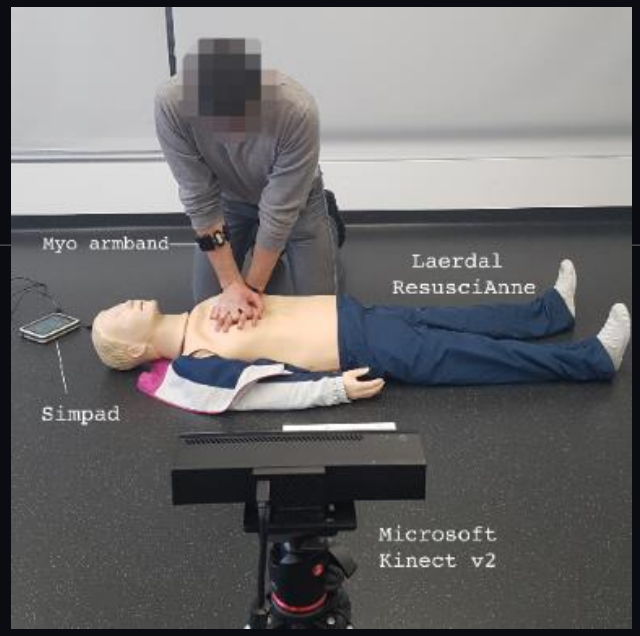


Psychomotor skills learning

We study approaches that happen in the psychomotor learning domains

Examples:

- Rehabilitation science & Medical simulations
- Sports: running, table tennis
- Arts and crafts
- 21st century skills: presentations

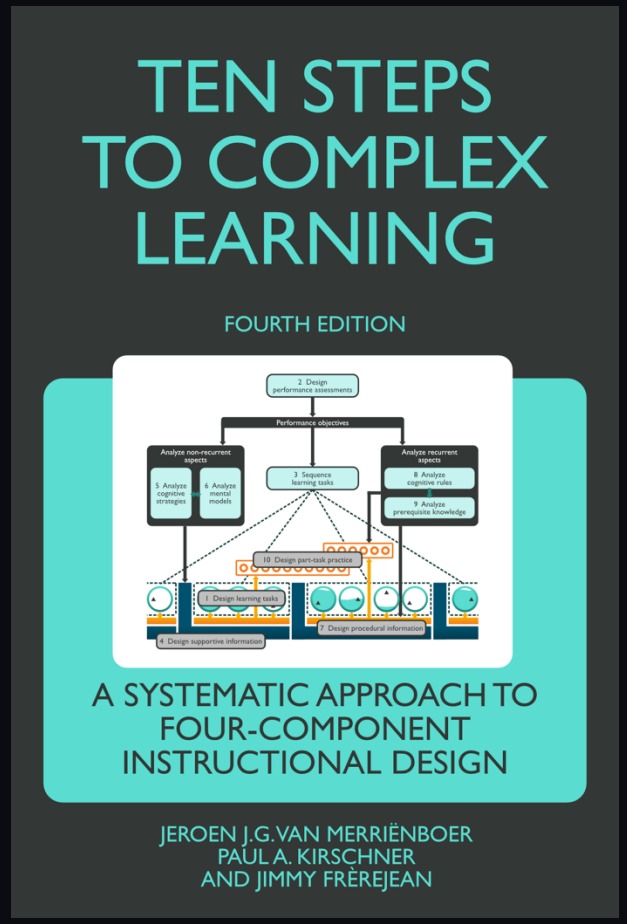








Psychomotor skills are complex skill

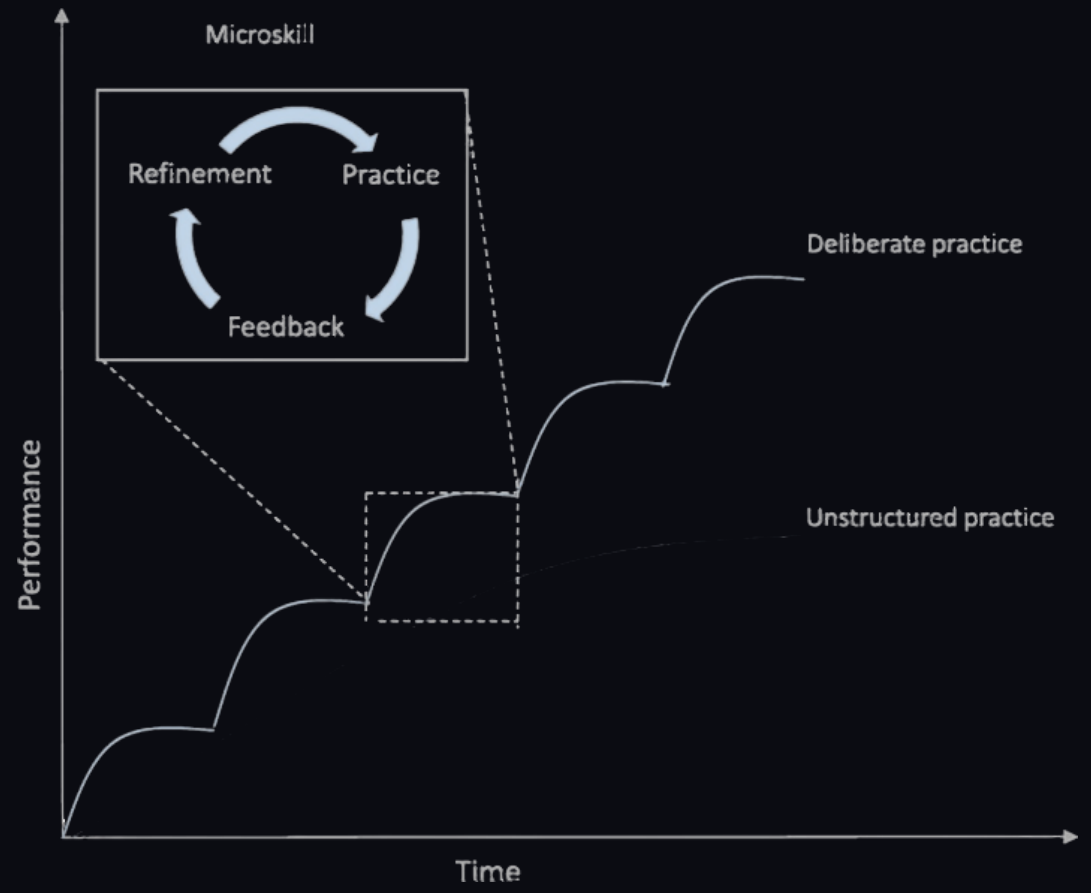


- complex tasks are composed of cognitive and psychomotor subtasks
- individual psychomotor skills worth learning would be a part of a complex skill



Jeroen van Merrienboer

Deliberate practice

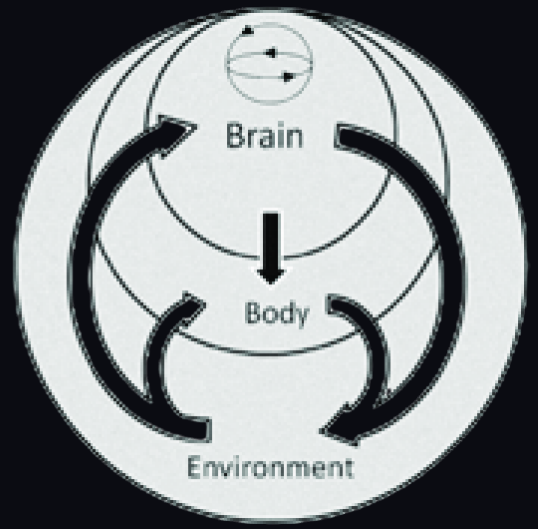


- Break complex skills into manageable subskills
- Set a specific goal, e.g. reduce filler words
- Cycles of
  - Practise with full concentration
  - Receive immediate, actionable feedback
  - Refinement and repetition
- Use expert guidance to target weaknesses.

Petrosoniak A et al Perfecting practice: a protocol for assessing simulation-based mastery learning and deliberate practice versus self-guided practice for bougie-assisted cricothyroidotomy performance. BMC Med Educ. 2019

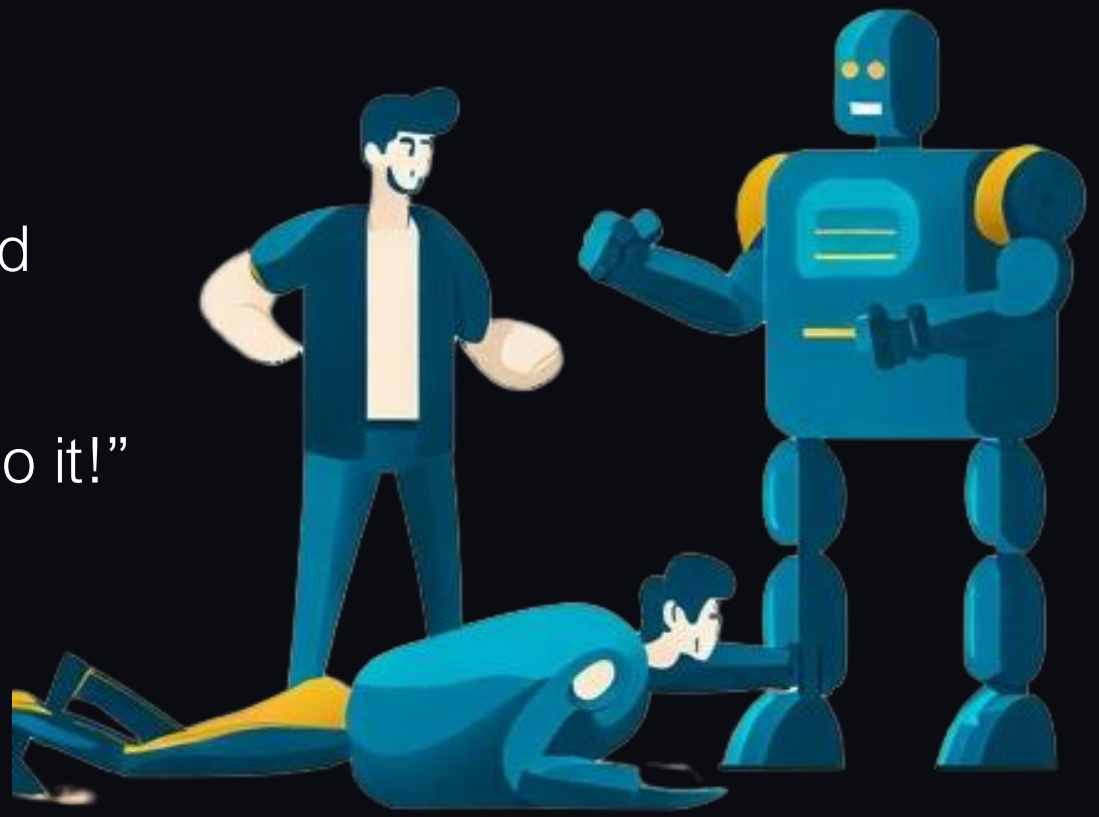
Using deliberate practice for cognitive tasks

- Cognitive skills are taught at abstract level
  - e.g. mathematics
- Psychomotor skills are
  - situated: depend on context,
  - hard to abstract and to transfer
- Deliberate practice is expensive and requires motivated learners



Technology space: **AI as a coach**

- Not just show you the correct solution
- Not just right or wrong feedback
- helps setting and achieving realistic goals and training plans
- It provides motivational feedback, “you can do it!”
- invites you to practice regularly



Example: Presentable – an AI tutor for oral presentation skills

Oral presentation skills





What makes an effective presentation?



Presenter



Audience



Goal



Content



Topic

➔ nearly nothing is “always right” / “always wrong”
➔ should be respected by software
➔ A software should encourage authenticity and individuality

Desinging with experts









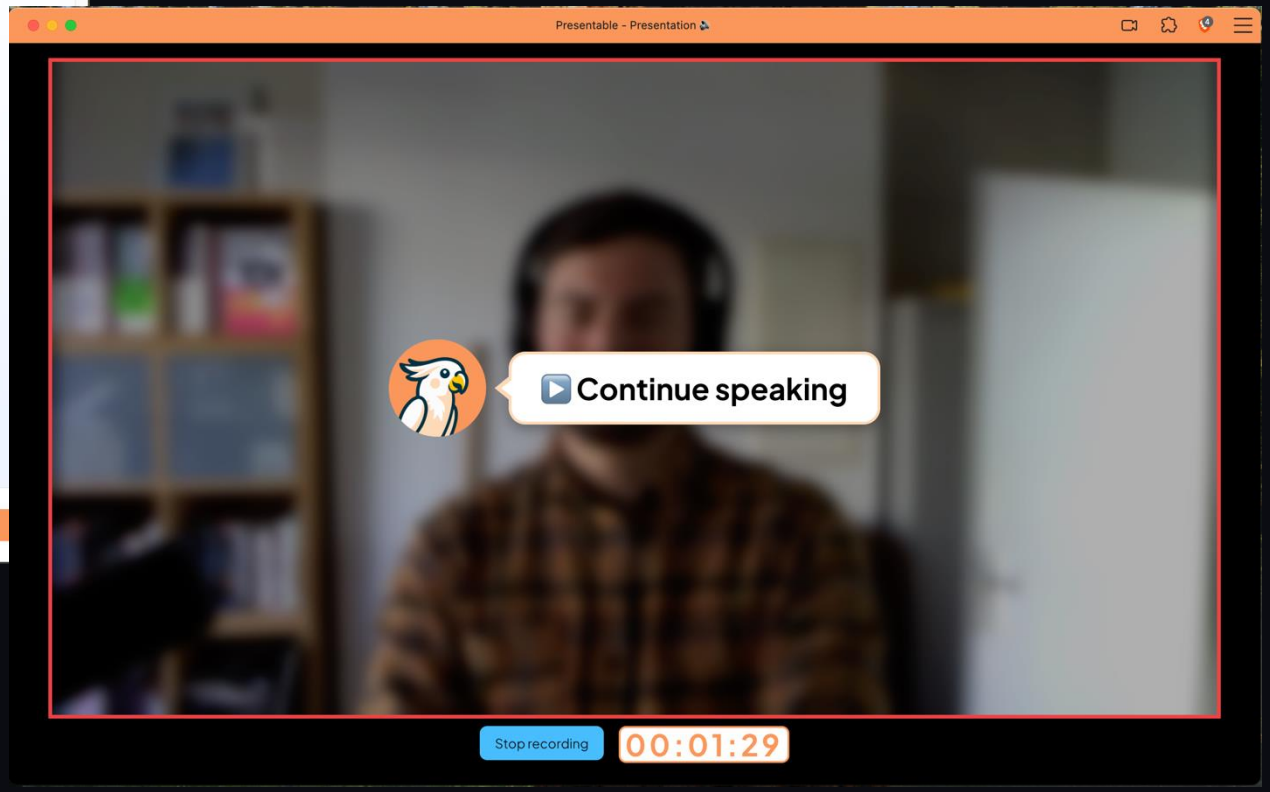


Guidance

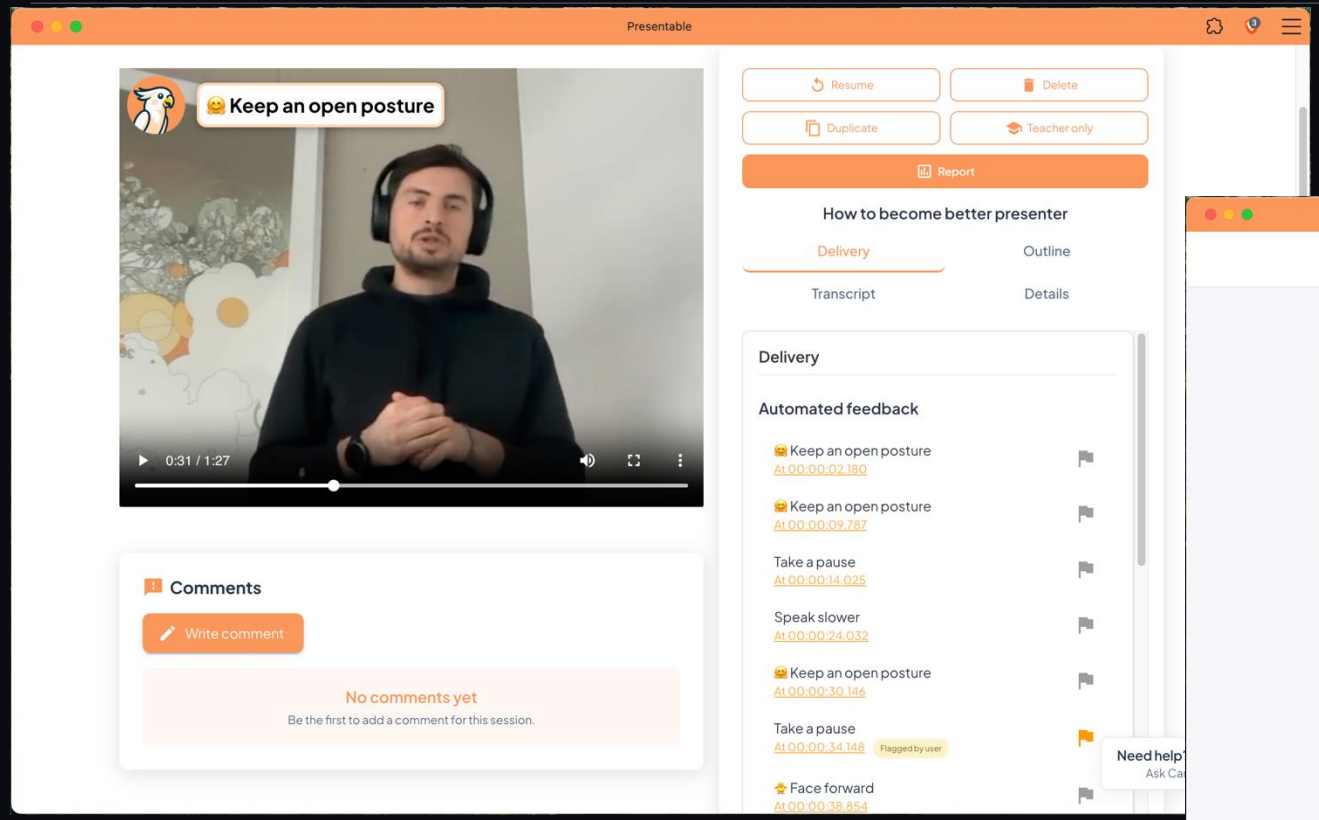


Presentable – a web-based presentation training



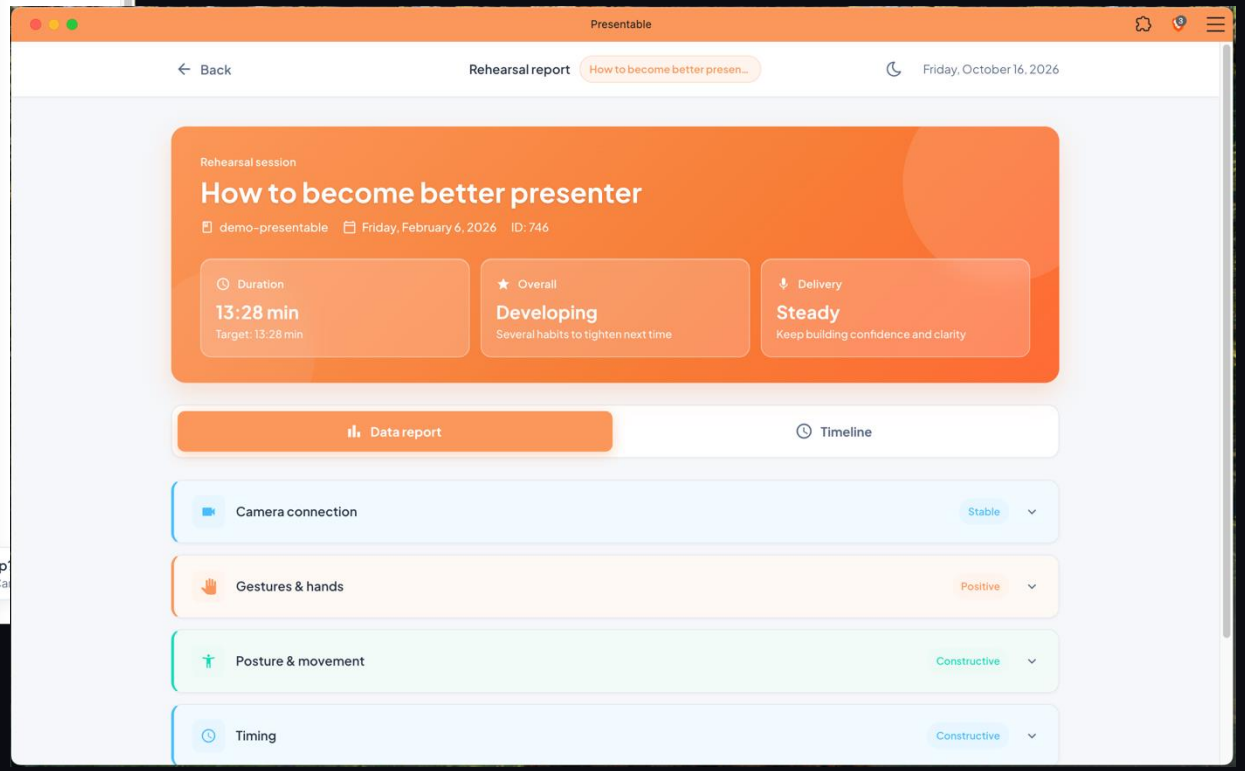


Rehearsal review and report

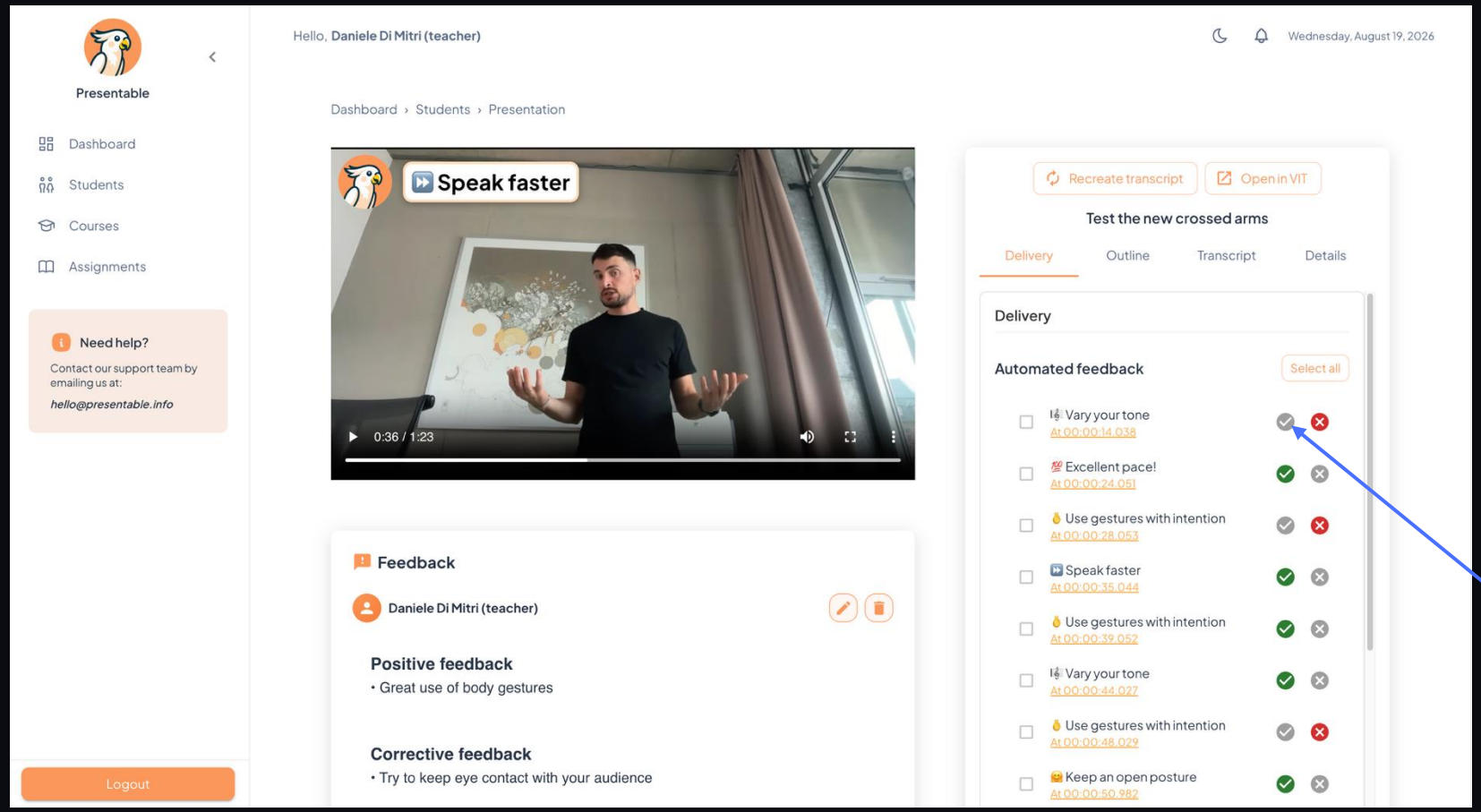


Review immediate feedback

Rehearsal report (retrospective feedback)



Teacher feedback and validation (of automated feedback)



Current Presentable feedback

FEEDBACK MESSAGE	
✅ Well done!	💯 Excellent pace!
🐥 Face forward	😮 💨 Breath and think what to say
🔽 Lower your hands	⏸ Take a pause
🤗 Keep an open posture	▶ Continue speaking
🤌 Use gestures with intention	🎼 Vary your tone
🦶 Align your feet	⏩ Speak faster
🐌 Speak slower	

Lessons learned from Presentable

- **Immediate feedback:**
  - hits the tip of the iceberg
- Need for **feedback literacy**:
  - Most often, learners lack the skills to understand and act upon feedback
- Deliberate practice fast cycle: instruction, practice, assessment – and then feedback



Guidelines for AI Tutor design

1. Define the skill, subskill, learner and purpose
2. Design the training for the subskills
3. Identify the constraints of the training
4. Select suitable technology to train the subskills
5. Examine what step be delegated to AI feedback
6. Implement and evaluate

1. Sense what happened
2. Interpret it, compare to a standard
3. Prioritize what matters now
4. Decide when to intervene
5. Formulate the message
6. Deliver it
7. Maintain the relationship

My recipe for engaging learning

INGREDIENTS

Subjectification: learner agency and an authentic voice.

Praxis: purposeful practice, reflection, and practical wisdom.

Engaged pedagogy: mind, body, and spirit.

Instructional design: meaningful tasks, progression, and feedback.

METHOD

1. Start with the whole learner, not just the performance.
2. Combine instruction with repeated, reflective practice.
3. Add timely feedback and opportunities to act on it.
4. Use AI to support the process, without replacing learner effort or teacher judgement.

Thank you for listening

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