



Transitioning from general-purpose to educational-oriented GenAI

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NOLAI
NATIONAAL
ONDERWIJSLAB AI

General-purpose GenAI vs. Educational GenAI

GenAI in education holds promise, supporting teachers (e.g., suggesting tailored learning activities) and students (e.g., benefiting from 24/7 assistance).

However, general-purpose GenAI tools



Lack contextualization



Lack pedagogical foundation



Limit personalization



Thread teacher autonomy

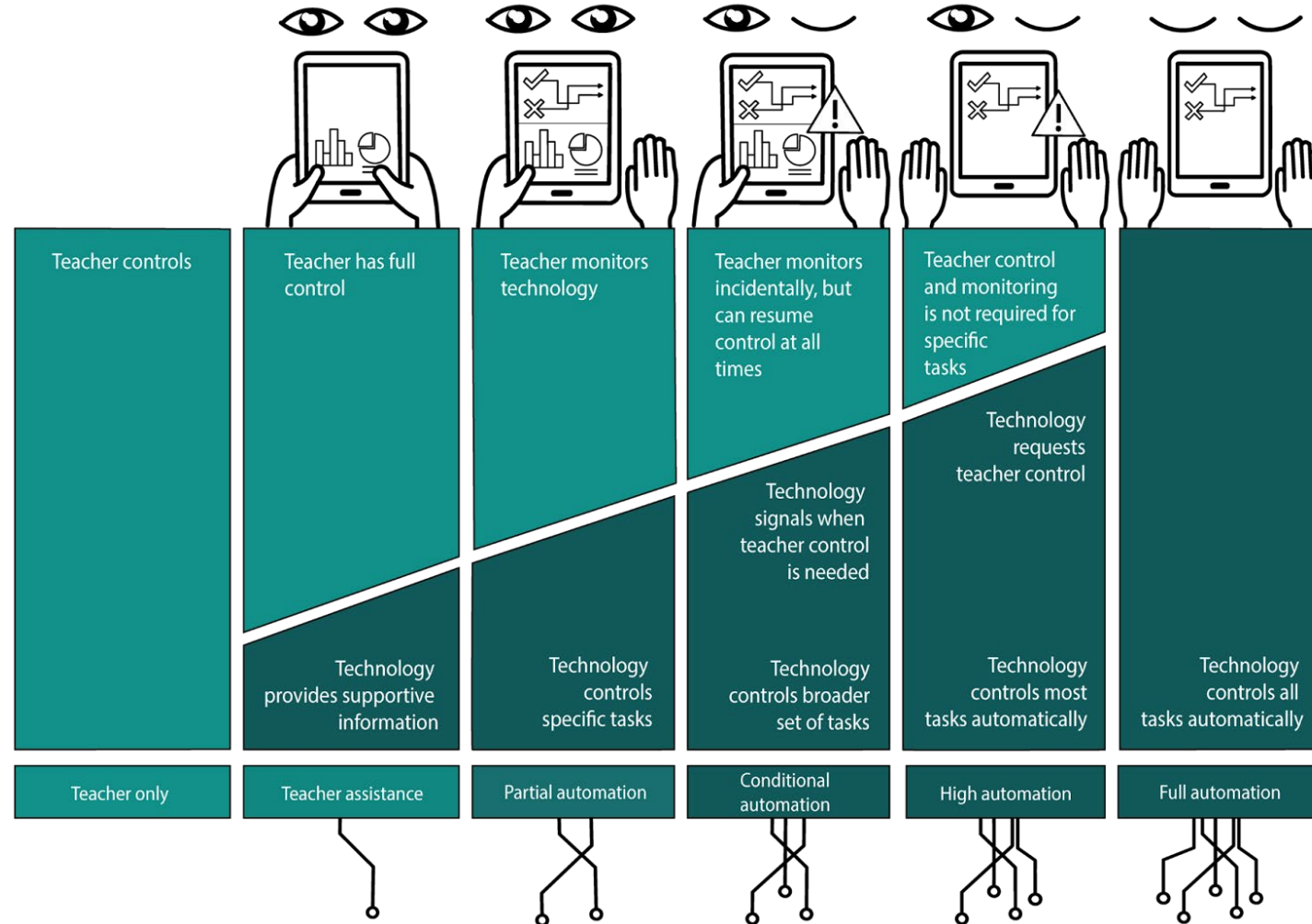
How can general-purpose GenAI tools be effectively transitioned into educational GenAI?

Automation – Augmentation Paradox

AUTOMATION & AUTONOMY



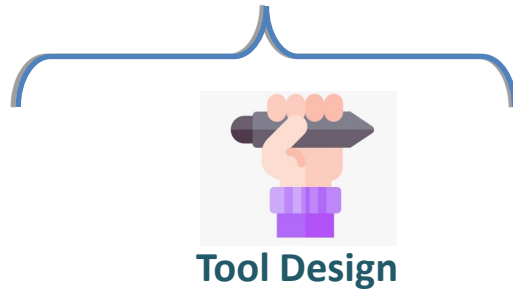
Autonomy during the lesson



Autonomy in design and lesson planning

Before lesson

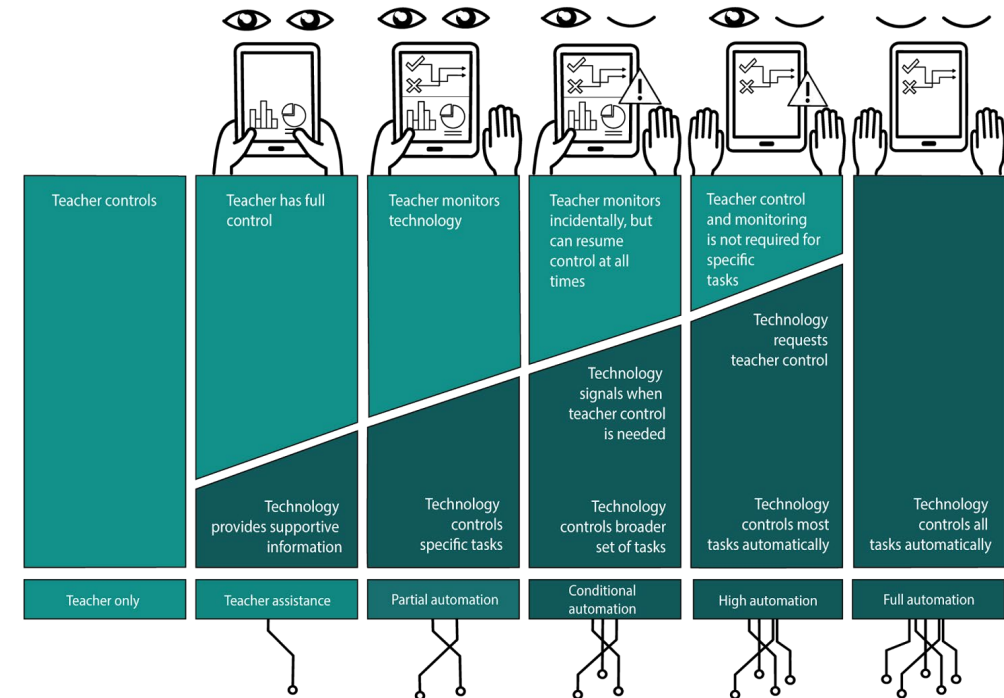
co-design partner - with teachers voicing their needs in interface, tool features



Instructional Cycle

co-orchestration teachers where they plan each lesson and apply the tool to their own teaching

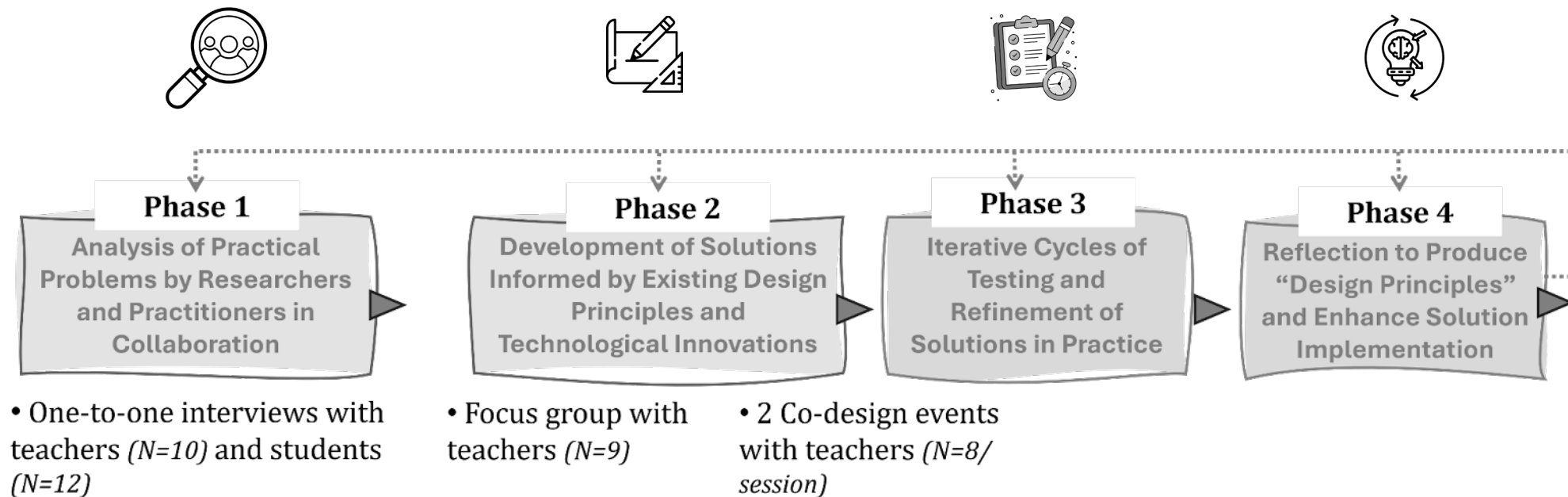
During lesson



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Methodology

Co-design process: teacher not *user* but *architects* of the GenAI-based tools



Identification of current GenAI Use and Teacher Needs [Phase 1]

Teacher concerns:



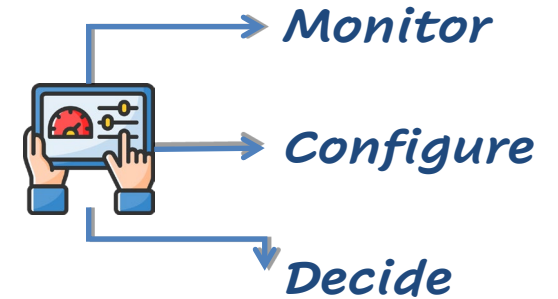
Student cognitive offloading

"I am afraid students have stopped thinking or brainstorming; this impact the development of critical thinking"



Student overreliance on the AI-generated outcome

"they [students] do not use other resources and uncritically they are copying everything"



Lack of control in the teaching process (N=8)

"Help! how can I guarantee my autonomy?"

"There is the problem that you cannot see how much it has been created by AI and how much by the students"

Teacher Requirements *[Phase 2]*



Co-create
the GenAI features



Configure
the GenAI features



Monitor
Student-AI interactions



Decide task division
between AI-teacher

Tool Co-Design

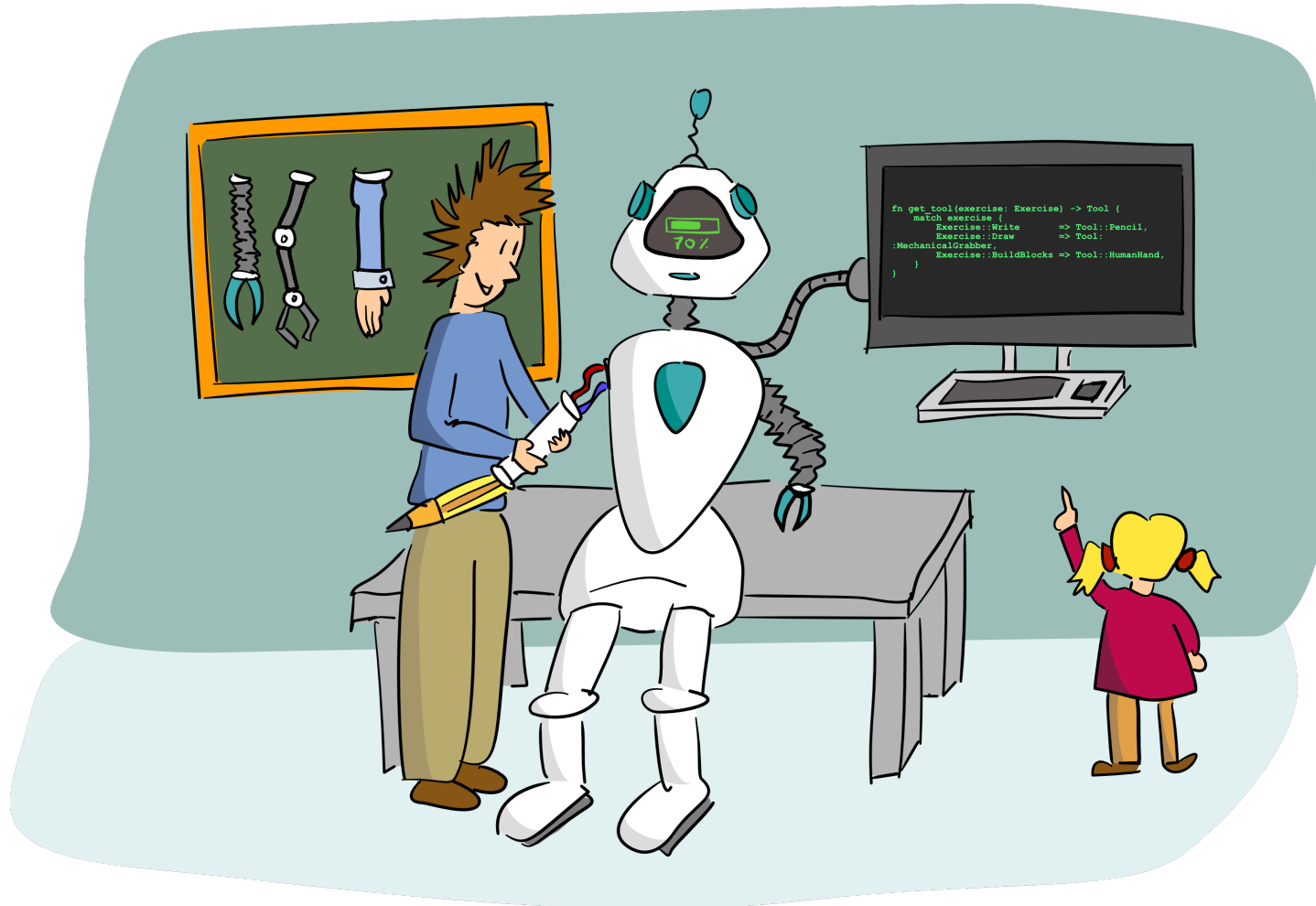
Lesson Co-Orchestration

Lesson Enactment

Before Class

During Class

Automation – Augmentation



Configure [Lesson Orchestration]

QUADRAAM Virtual Campus

UvA Home Dashboard My Courses My Campus Help My Media

Course Settings Participants Grades Reports More

ENGLISH (VWO 3)

GenAI Tool -- Teacher Interface > GenAI Settings

Configure options for students' GenAI prompting:

- ☒ Daily prompting limit:
- ☐ Word answer minimum length:
- ☒ Word answer maximum length: 50
- ☒ Forced hallucination percentage: 33
- ☒ Behaviour when asking for direct solutions:
 - Provide scaffolding feedback without the direct solution
 - No filtering
 - Inform the student that direct solutions are not possible
 - Provide scaffolding feedback without the direct solution
- ☐ Customized add-ons to students' prompts:
e.g., "provide an answer for a 15-years-old student"

Return



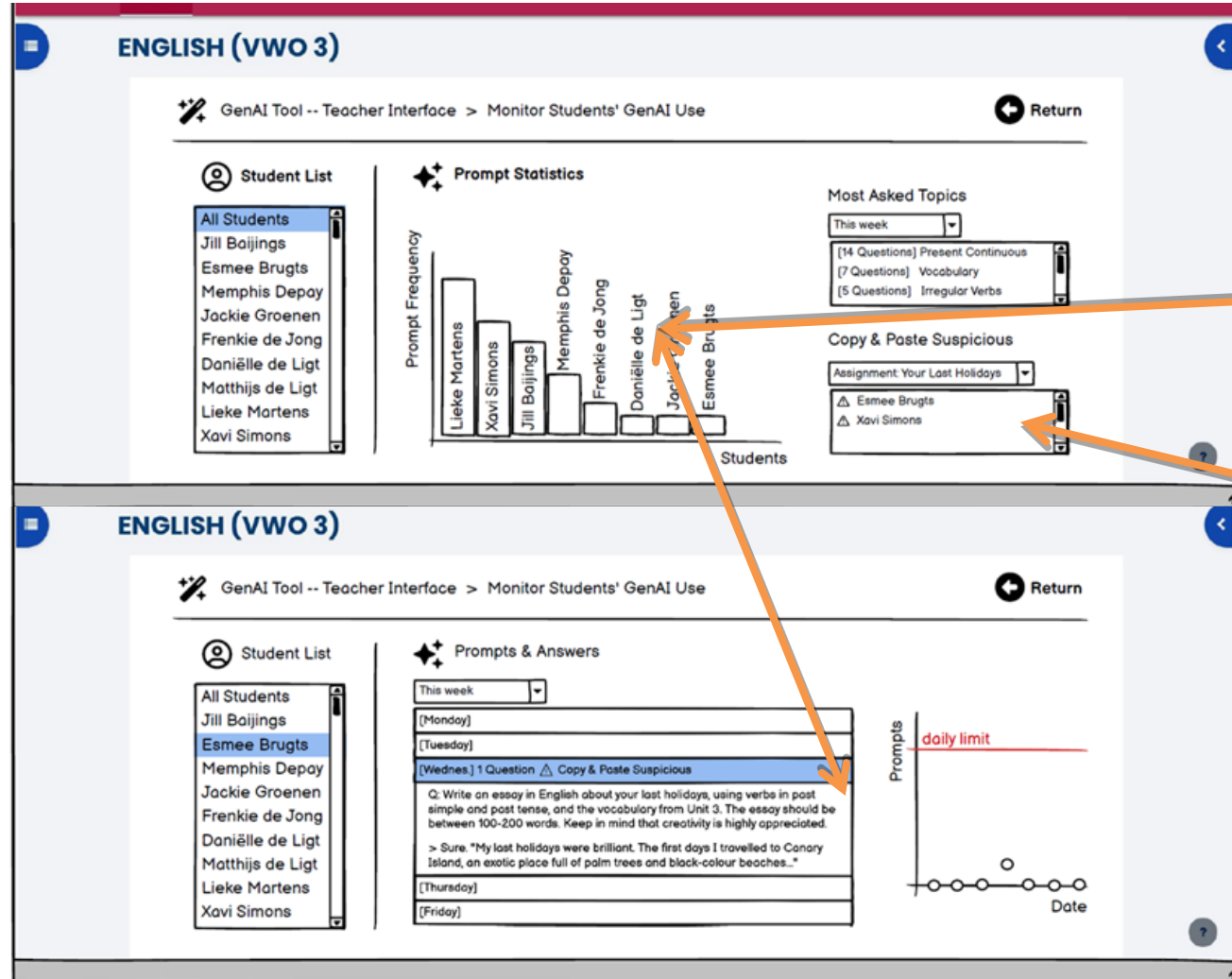
Critical Thinking



Direct the learning process

- Ortega-Arranz, A., Topali, P., García-Zarza, P., Bote-Lorenzo, M. L., Asensio-Pérez, J. I., & Molenaar, I. (2026). GenAI analytics and pedagogical configurations: Featuring new generative AI systems in education. *In Proceedings of the 16th International Learning Analytics and Knowledge Conference*
- Ortega-Arranz, A., Topali, P., & Molenaar, I. (2025). Configuring and monitoring students' interactions with generative AI tools: Supporting teacher autonomy. *In Proceedings of the 15th International Learning Analytics and Knowledge Conference*

Monitor [Lesson Enactment]



Student-AI
engagement

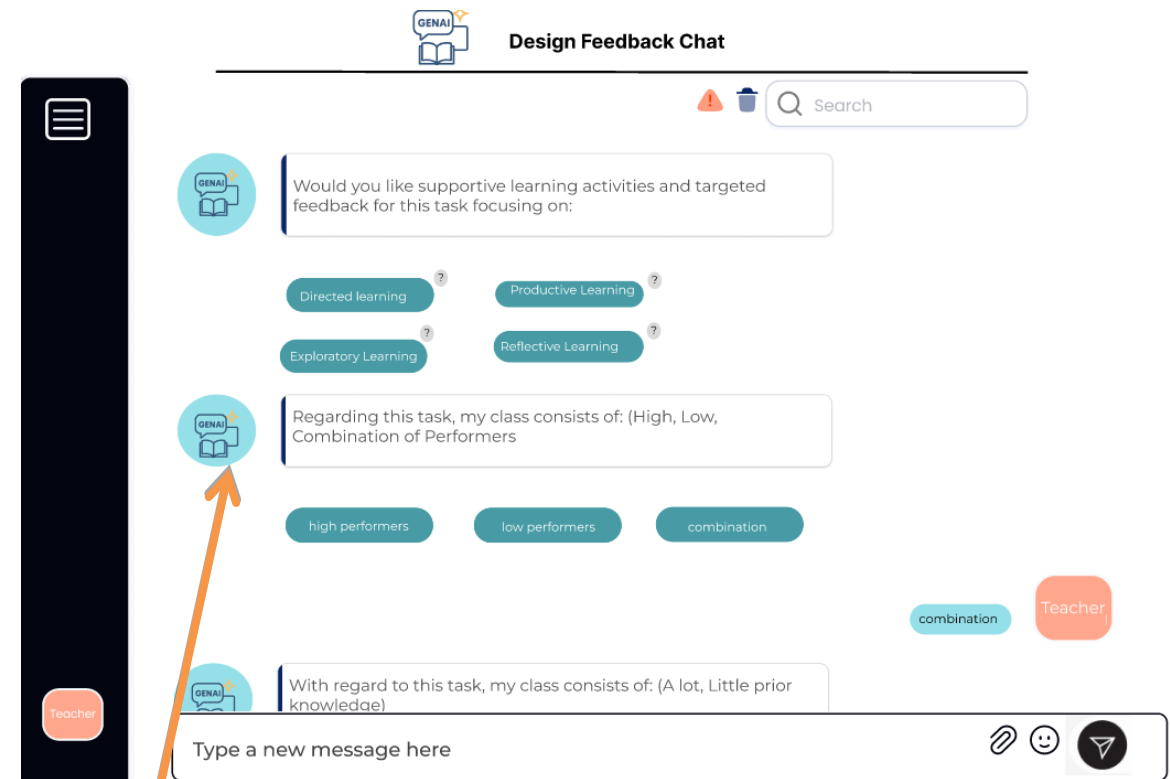


AI Misuse

- Ortega-Arranz, A., Topali, P., García-Zarza, P., Bote-Lorenzo, M. L., Asensio-Pérez, J. I., & Molenaar, I. (2026). GenAI analytics and pedagogical configurations: Featuring new generative AI systems in education. *In Proceedings of the 16th International Learning Analytics and Knowledge Conference*
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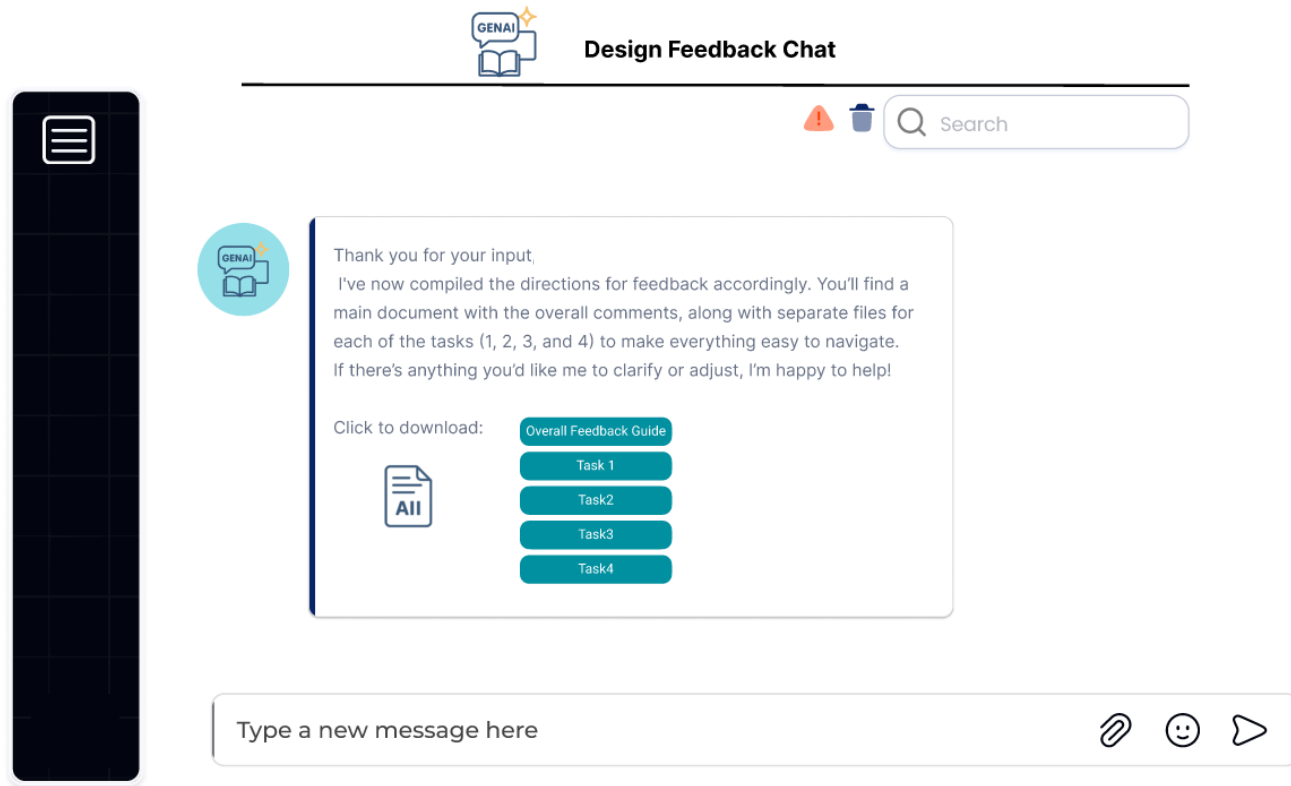
Task Division [Lesson Orchestration & Lesson Enactment]

Teacher interface



The Teacher interface, titled "Design Feedback Chat", features a sidebar with a menu icon and a "Teacher" label. The main chat area displays a conversation with GENAI. The first message from GENAI asks for feedback focus, with buttons for "Directed learning", "Productive Learning", "Exploratory Learning", and "Reflective Learning". The second message from GENAI asks about class composition, with buttons for "high performers", "low performers", and "combination". The third message from GENAI asks about prior knowledge. A search bar and a "Type a new message here" input field are at the bottom. A "Teacher" label is visible in the bottom right of the chat area.

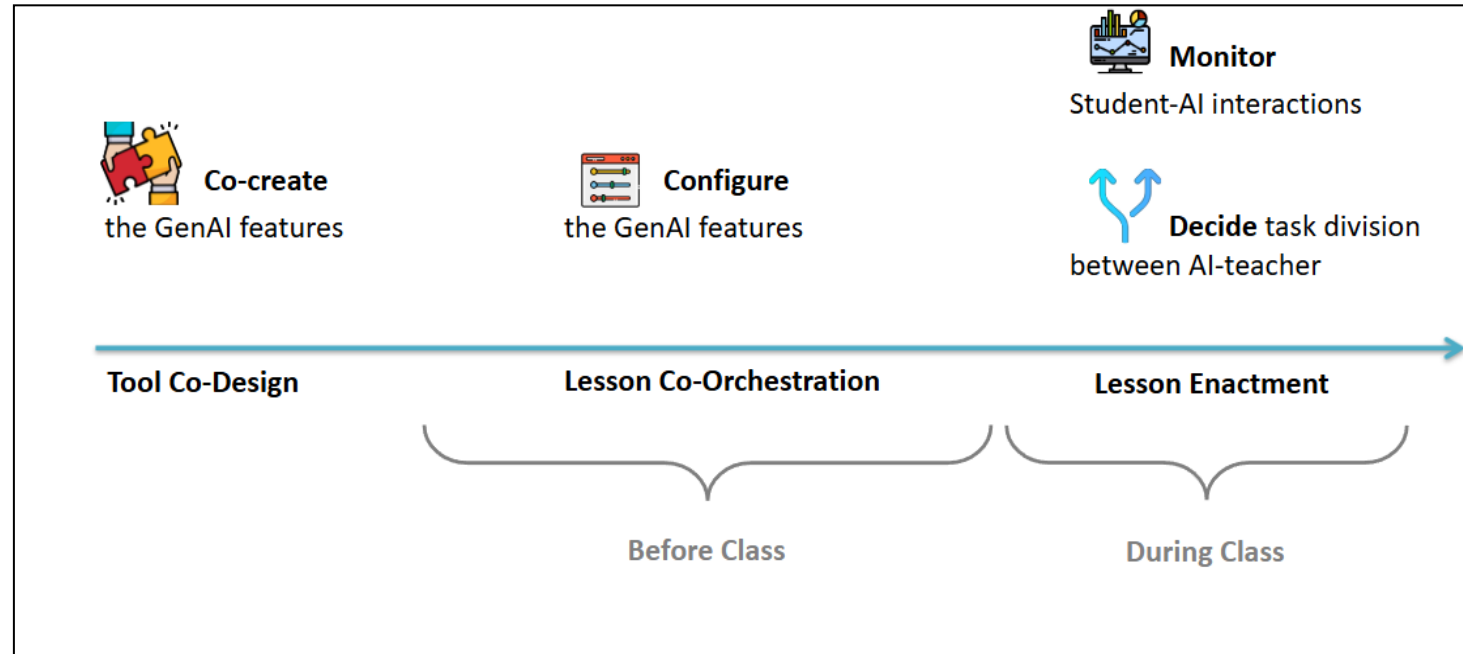
Student interface



The Student interface, also titled "Design Feedback Chat", features a sidebar with a menu icon. The main chat area displays a message from GENAI thanking the user and providing feedback directions. Below the message, there is a "Click to download:" section with a file icon labeled "All" and a list of buttons: "Overall Feedback Guide", "Task 1", "Task2", "Task3", and "Task4". A search bar and a "Type a new message here" input field are at the bottom.

 Create and deliver (semi)automated feedback

From General-purpose GenAI to Educational GenAI



Addressed key limitations of general-purpose GenAI tools:

- Lack of **contextualization** Collaborate with teachers to align the GenAI tool with lesson plans and classroom activities
- Limited **personalization** Enables teachers to monitor student progress // Supports adaptive, individualized feedback
- Weak **pedagogical foundation** Align the prototypes with pedagogical theories (e.g., feedback theory)
- Threats to **teacher autonomy** Enhances teachers' ability to act and fine-tune tool using their professional judgment



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