Augmented Reality Tutor (ART)
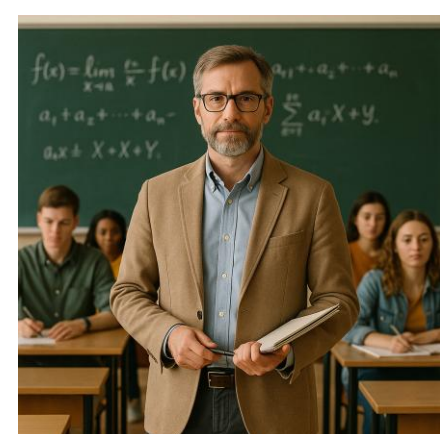
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Open Universiteit

Educational Challenges

EDUCATION INSTITUTION
- Teachers are a **scarce resource**
- Institutions must keep an **innovative profile**
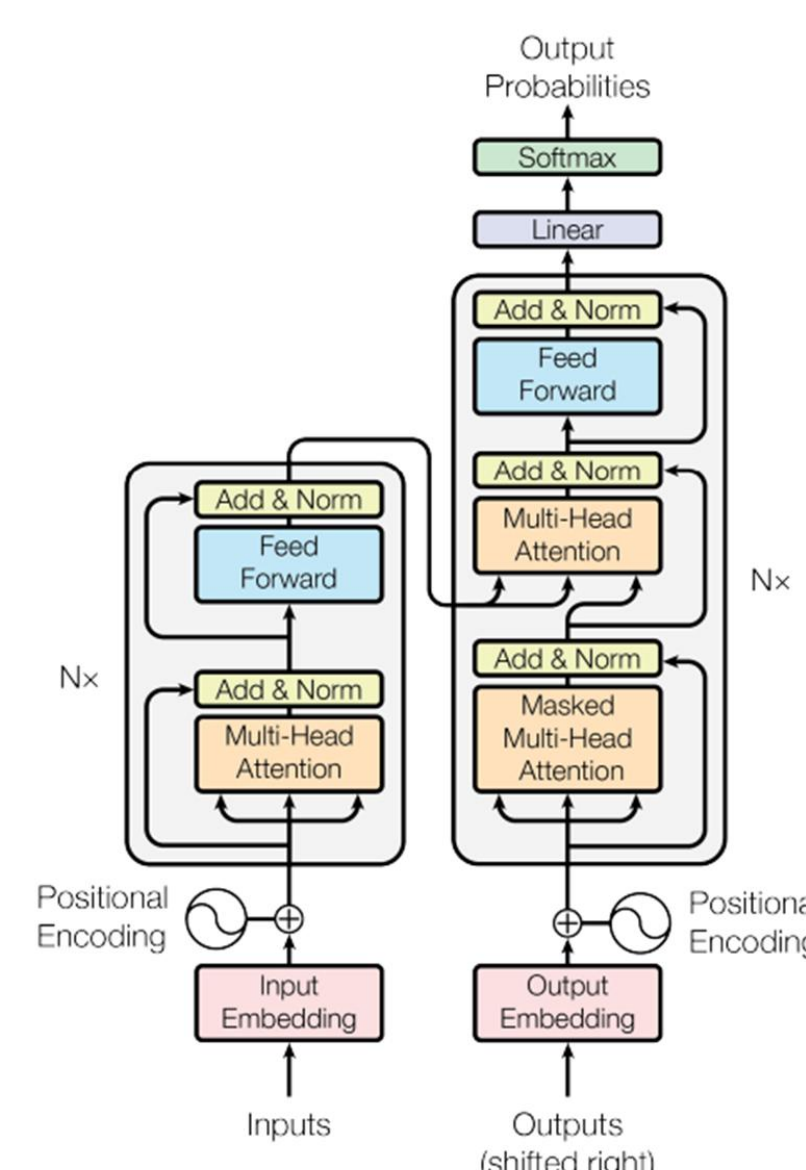- Must protect student **privacy** and content **IP**

TEACHER
- Teachers are **overburdened**
- **Uncontrolled AI** threatens education quality
- Concerns of AI **taking away jobs**

STUDENT
- Students have **limited access** to teachers
- **Motivation challenges** of self-paced learning
- **Non-curated AI** in education has risks

Technical Challenges

LARGE LANGUAGE MODELS (LLMs)
- **Hallucination**: generated text appears plausible but can be inaccurate.
- **Source attribution**: limited ability to verify sources or to check the validity of the produced text
- **Not designed for education**: LLMs provide non-curated information
- **Algorithmic transparency:** neither the process, nor the outcome is explained
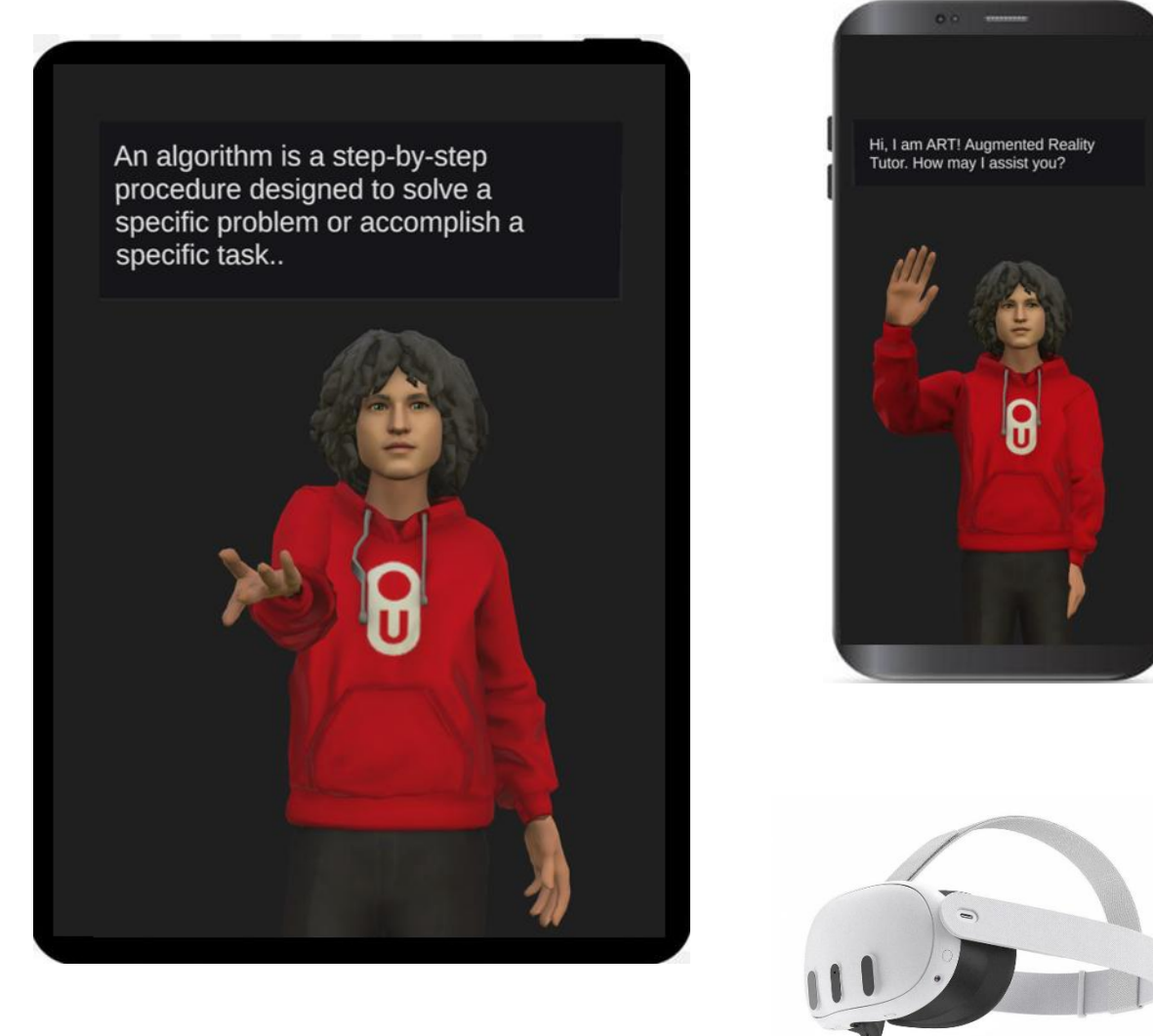- **Privacy & IP Protection:** LLMs has access to vast student data, which might include sensitive information.
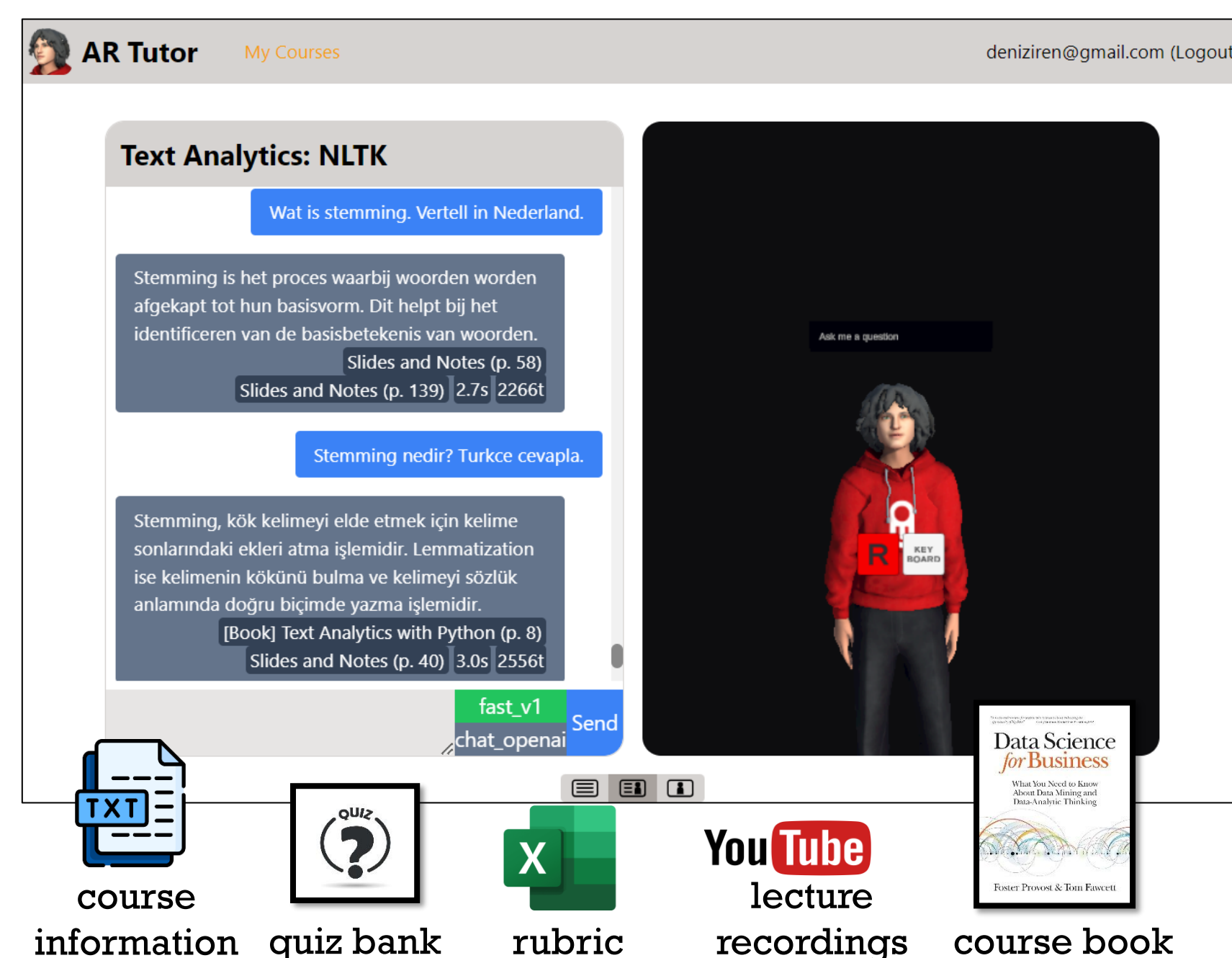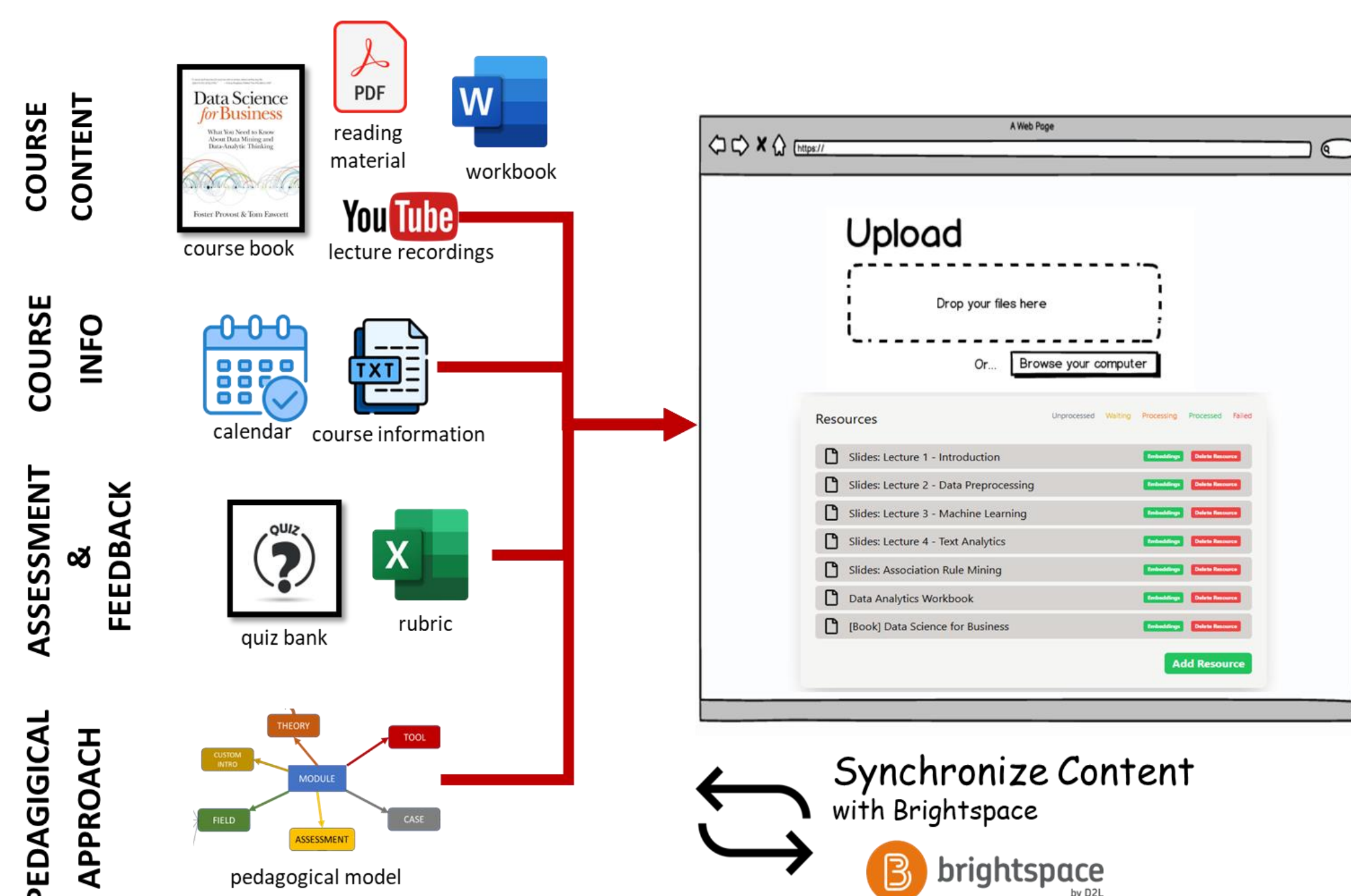
ART for Students

Mass-personalization and pedagogy-first design
- ART answers student questions, and gives references to **original sources** of the provided information
- ART learns the students' **preferences** and **needs**
- Challenges students with **customized quizzes**
- Provides **real-time feedback**, prescribes **learning activities**
- **Simplifies** complex topics, **summarizes** videos and book chapters

ART for Teachers

Synchronize Content with Brightspace

Teacher is always in control!
- **Collaboratively designed** with education professionals
- Teachers **curate** their courses on ART by uploading course materials
- Most behavioral aspects of ART is **customizable**
- ART generates **quiz questions** for every course material, Questions approved by the teacher are made available to the students
- Provides a link for students to **enroll easily**

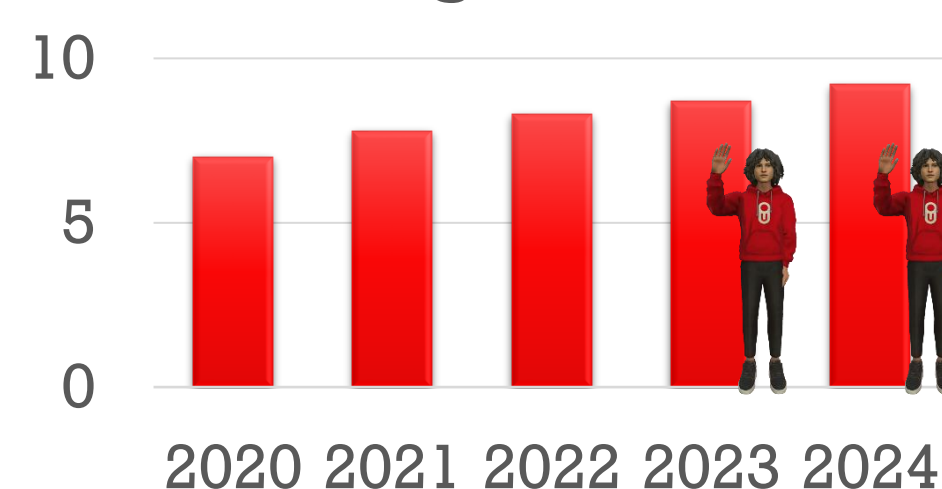## Specifications

SPECIFICATIONS
- Language **model-agnostic**
- Platform **independent**
  - Any device with a browser
  - **No app** required
- Speech **integrated**
- Ensures Privacy and IP protection

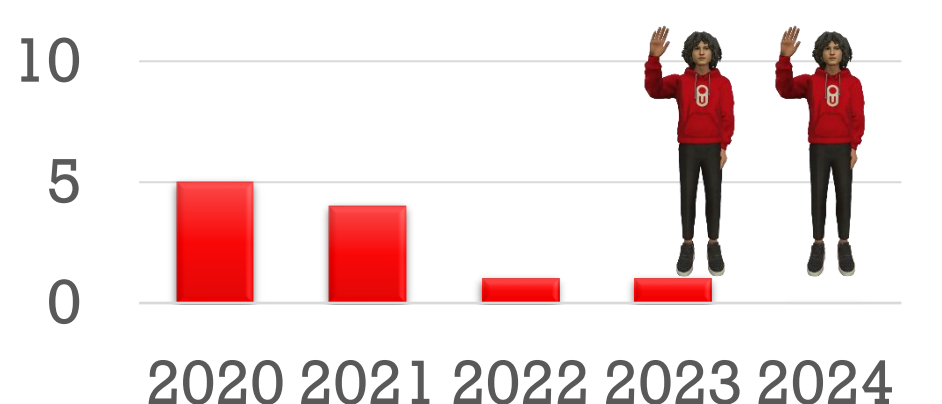## Observations from Education Practice

Netherlands
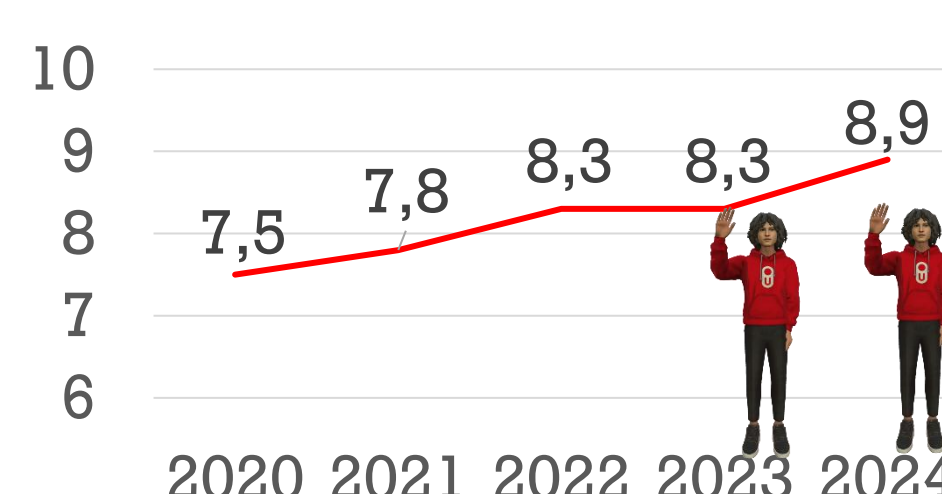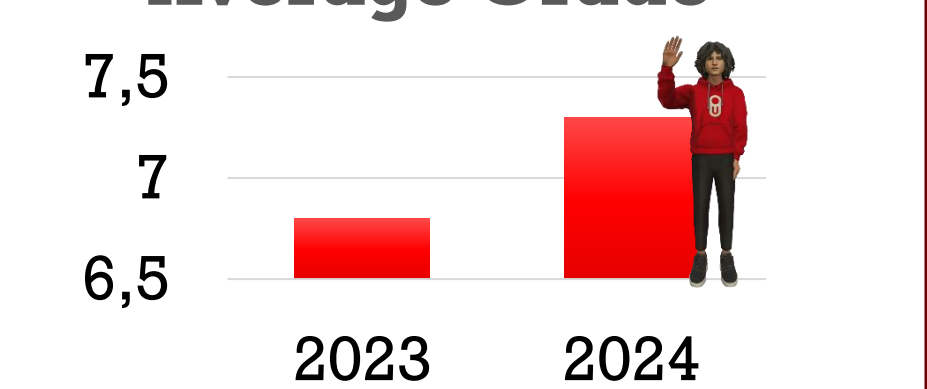- Open Universiteit www.ou.nl
- TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY
- Maastricht University

Germany
- Philipps Universität Marburg
- Universität Rostock

Austria
- MCI INNSBRUCK | AUSTRIA

Author

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Average Grade

2020 2021 2022 2023 2024

Failed Students

2020 2021 2022 2023 2024

Feedback from Students

7,5   7,8   8,3   8,3   8,9
2020 2021 2022 2023 2024

Philipps Universität Marburg

Average Grade

2023 2024

Failed Students

■ 2023 ■ 2024
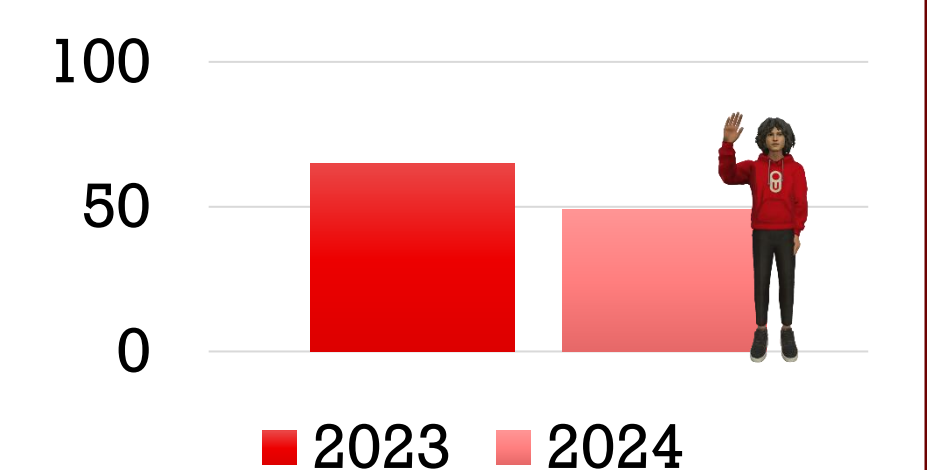
Lessons Learned

- Answering student questions is not enough anymore
- Focus on **learning activities**
- Do not replace the **higher-order thinking**
- **Pedagogy first**, technology later
- Use technology to **enhance meaningful roles** of the teacher and replace the tedious ones only
- Timely and **actionable feedback** is more important than correct answers
- Comply with **regulations**
- **Continuously innovate** or go extinct!

AR TUTOR

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Dutch History

Dutch Painters

Text Analytics

Join a course and try ART