

Educating for a Future with AI: Is Higher Education Transforming?

7th China Forum | Graz University of Technology, Austria

2025-11-20

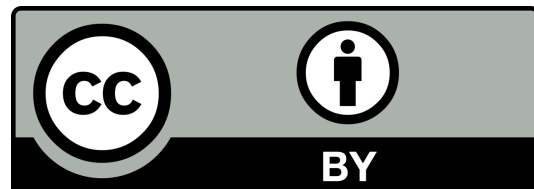
Benedikt BRÜNNER, MEd BEd

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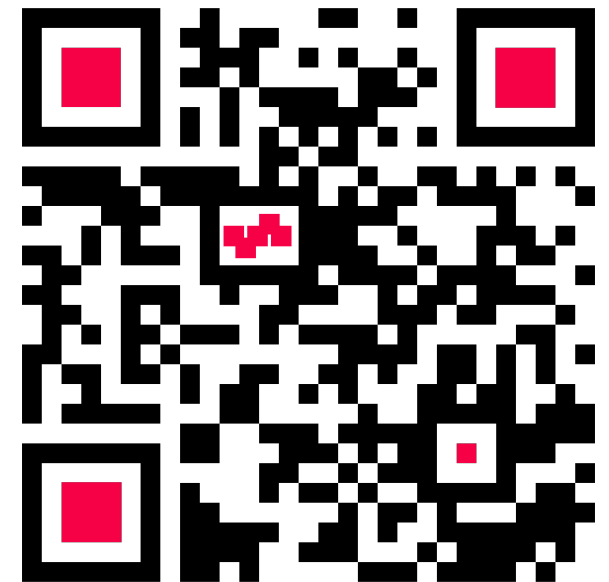
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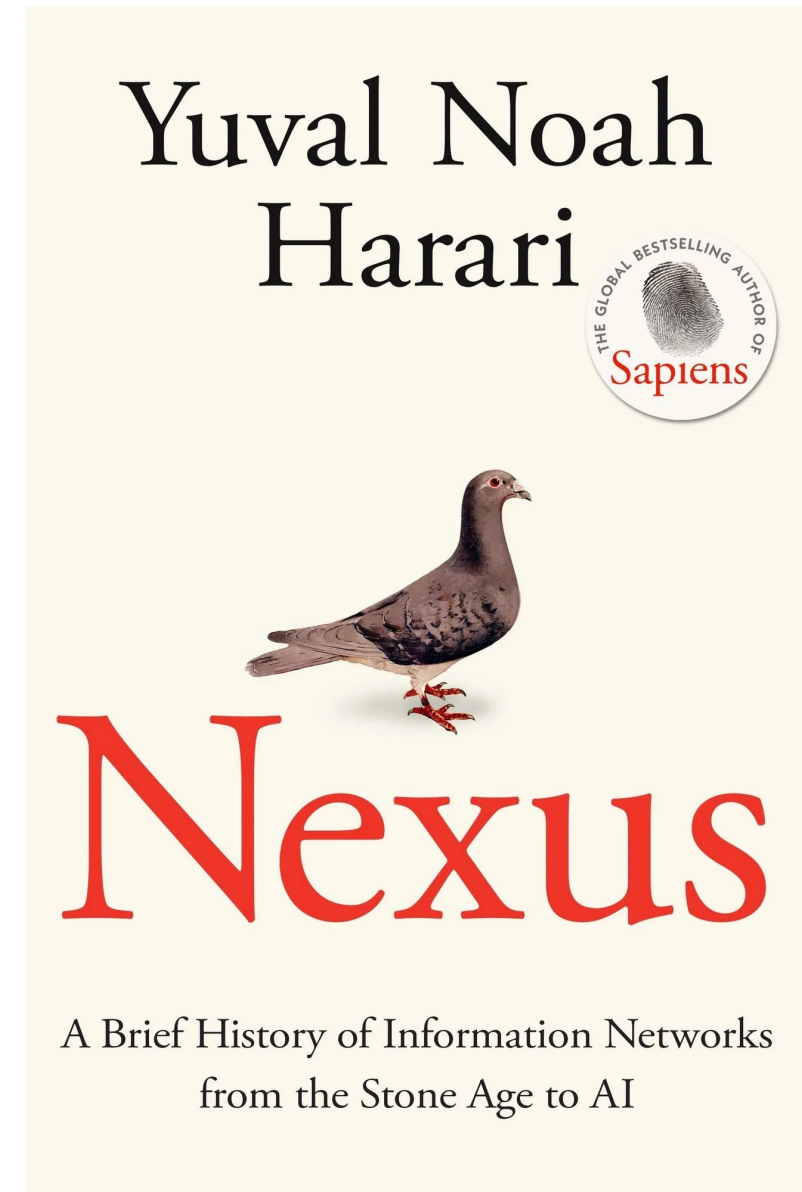
Benedikt Brünner
ed-tech.at



Machines as Thinking Actors?

- Yuval Noah Harari, 2024: Nexus
 - „AI can process information by itself, and thereby replace humans in decision making. AI isn't a tool — it's an agent.“

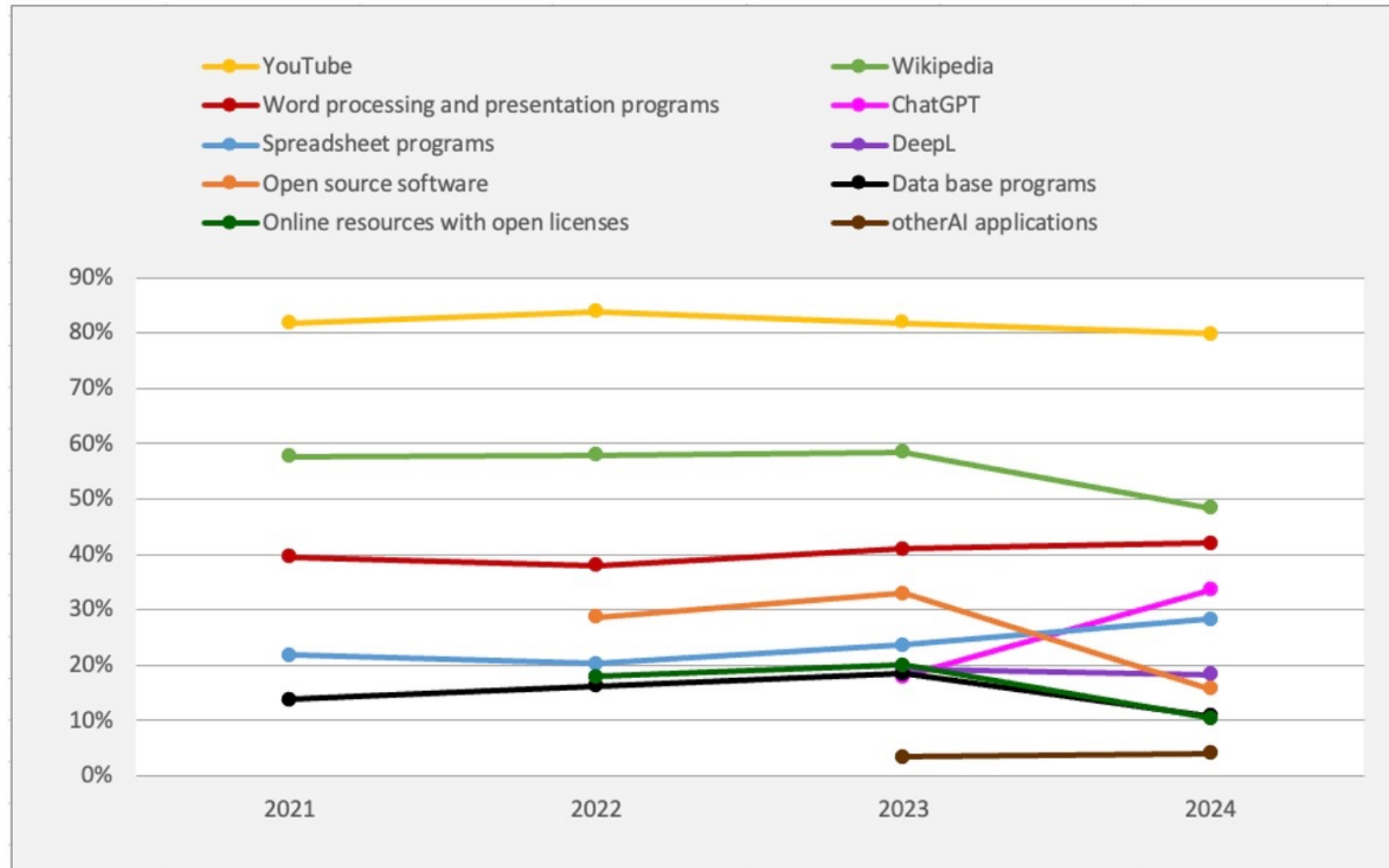
Screenshot from book cover



AI in Education

- The question is not **if**, but **how**

First-semester student survey at
TU Graz 2024 (Nagler et al., 2025)



What Counts as AI in Education? I

- Image Recognition (Computer Vision)
 - Deep learning with Convolutional Neural Networks (CNNs)
 - Automatic correction of handwritten math problems
- Natural Language Processing (NLP)
 - Transformer models
 - Translation of texts into other languages
- Speech Technologies (Speech-to-Text / Text-to-Speech)
 - Deep learning, e.g., Recurrent Neural Networks (RNNs) or transformers
 - Real-time transcription of lectures

What Counts as AI in Education? II

- Predictive Analytics
 - Classical machine learning (e.g., Random Forest)
 - Early detection of students at risk of performance decline
- Recommender Systems
 - Collaborative filtering
 - Personalized suggestions for learning videos and exercises
- Generative AI (genAI)
 - Transformer-based generative models
 - Automated creation of learning materials

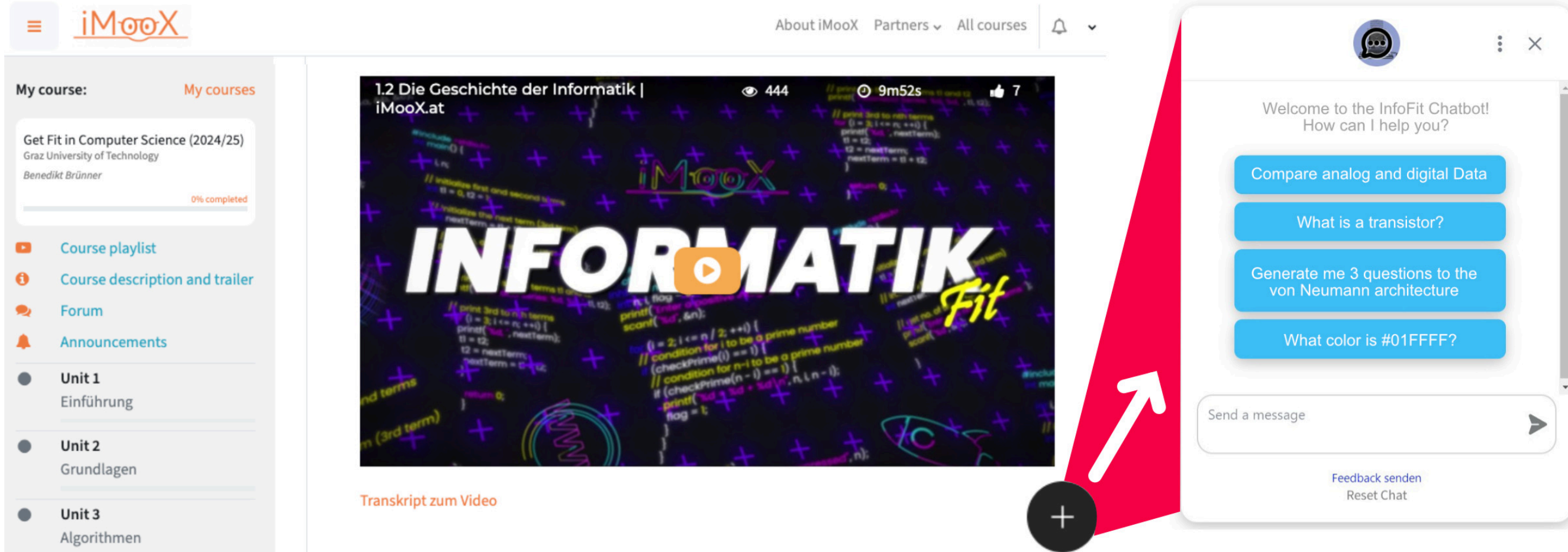
Multi-Modal genAI

- genAI for
 - Text
 - Code
 - Images
 - Audio
 - Video

Who is the Author of AI-Generated Content?

- AI writes text, programs code, creates images
 - But: Only natural persons are considered authors
 - Austrian Copyright Act (1936, as amended)
 - threshold of originality
 - Problem: AI produces, but does not “create” (German: „schafft“) in the legal sense

AI Chatbots as Low-Threshold Support



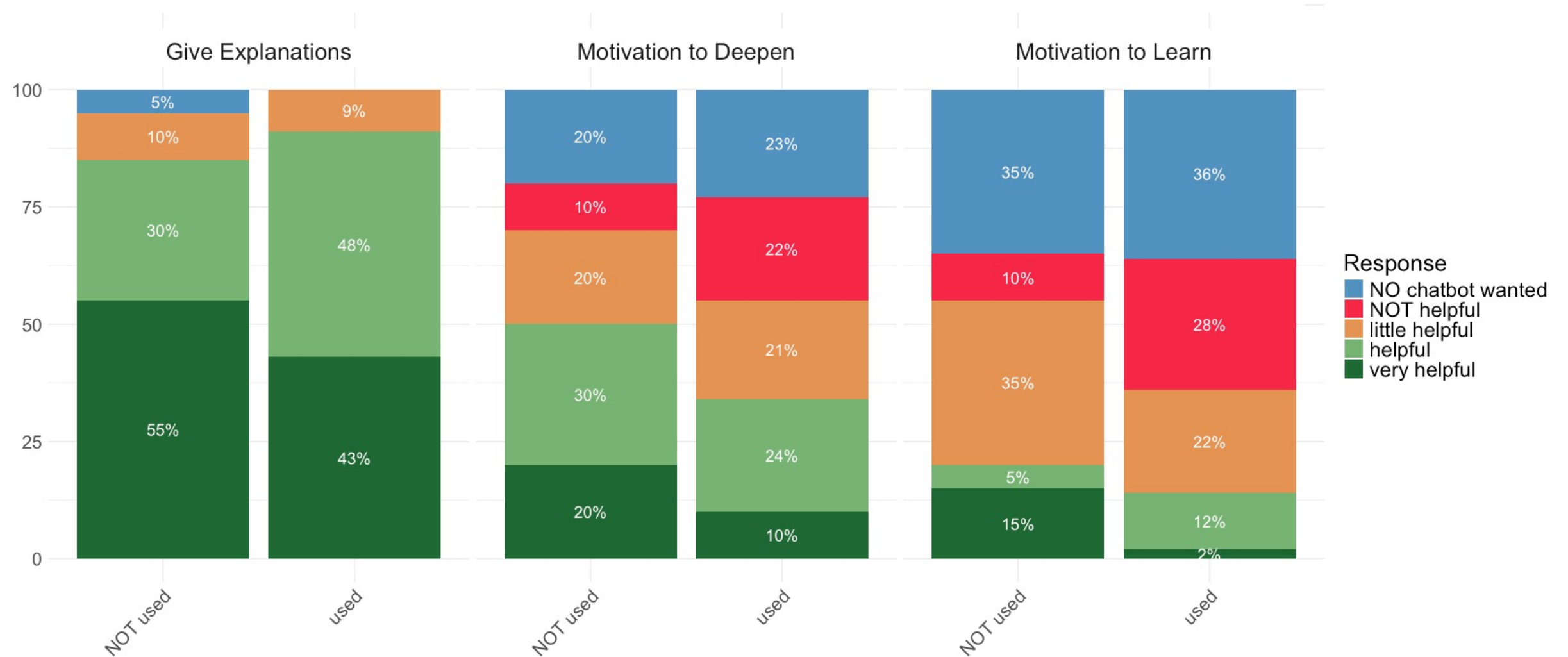
The image displays the iMooX website interface. On the left, a sidebar shows the course 'Get Fit in Computer Science (2024/25)' by Benedikt Brünner, with a 0% completion status. Below this are links for the course playlist, description, forum, and announcements. The main content area features a video player for '1.2 Die Geschichte der Informatik | iMooX.at' with 444 views and a 9m52s duration. The video thumbnail shows the word 'INFORMATIK' in large white letters on a black background with colorful code snippets. A red arrow points from the video player to an AI chatbot interface on the right. The chatbot, titled 'Welcome to the InfoFit Chatbot! How can I help you?', offers four preset questions: 'Compare analog and digital Data', 'What is a transistor?', 'Generate me 3 questions to the von Neumann architecture', and 'What color is #01FFFF?'. It also includes a text input field for sending messages and buttons for feedback and resetting the chat.

Figure: Brünner and Ebner, 2025

Key Findings

- Non-users rated the chatbot as more helpful than users
 - Possible cause: hype or novelty effect
- 98% want reuse
- Integration in courses with substantial self-study is reasonable

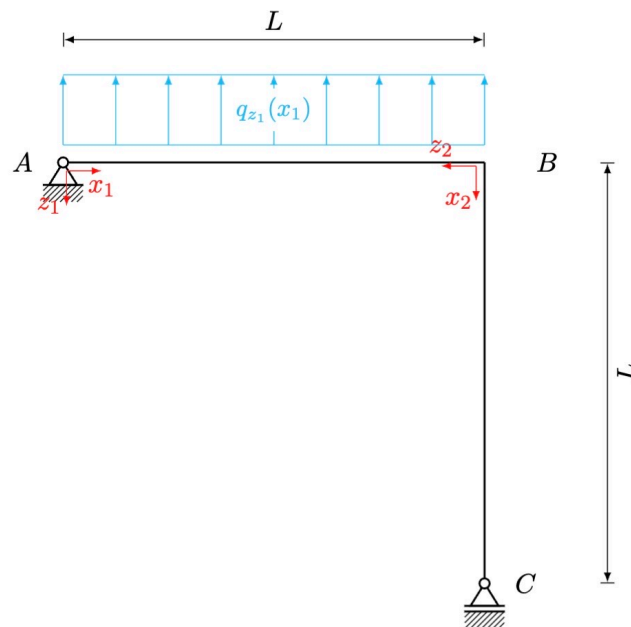
How Helpful Is the Chatbot? (Brünner & Ebner, 2025)



Mechanics in Civil Engineering II Chatbot (Eberl, n.d.)

Berechnen Sie für das dargestellte mechanische System

- die Biegelinie $w_1(x_1)$, sowie
- den Verschiebungsverlauf $u_2(x_2)$.



Die Steifigkeiten und Belastungen der Einzelstäbe betragen:

- Stab 1: $EI_1 = EI$, $EA_1 \rightarrow \infty$, $q_{z1}(x_1) = q$
- Stab 2: $EI_2 \rightarrow \infty$, $EA_2 = EA$

At which point does the maximum bending moment occur?

Baumechanik 2 - Chatbot für die zweite Hausübung

Ihre Eingaben werden zu wissenschaftlichen Zwecken ausgewertet, jedoch nicht mit personenbezogenen Daten kombiniert. Beachten Sie, dass die Inhalte zur Verarbeitung an OpenAI gesendet und vom Modell `o3-mini` verarbeitet werden. [Impressum](#)

Chatbot für Beispiel

bsp2-31

Chatbot

Die Extremstellen liegen also bei

$$L - 2x_1 = 0 \implies x_1 = \frac{L}{2}.$$

Setzt man $x_1 = \frac{L}{2}$ in den Momentenausdruck ein, so erhält man:

$$M_{1,\max} = \frac{q}{2} \frac{L}{2} \left(L - \frac{L}{2} \right) = \frac{q}{2} \frac{L}{2} \frac{L}{2} = \frac{qL^2}{8}.$$

Bezüglich des Vorzeichens ist zu beachten, dass die nach unten gerichtete Last gemäß der gegebenen Vorzeichenkonvention für $q_{z1}(x_1)$ zu einem negativen Biegemoment führt, sodass man schreibend

$$M_{1,\max} = -\frac{qL^2}{8},$$

wobei hier der Betrag $\frac{qL^2}{8}$ das maximale Moment beschreibt.

Daher tritt das maximale Biegemoment in Beam 1 genau in der Mitte der Stützweite, also bei

$$x_1 = \frac{L}{2}.$$

Zusammenfassung in LaTeX-Form:

Baumechanik 2 - Chatbot für die zweite Hausübung

Absenden

Interactive Video Path

- iMooX.at/course/genKI



Wie funktioniert genKI?

Im Sommer ist es warm,
im Winter ist es kalt

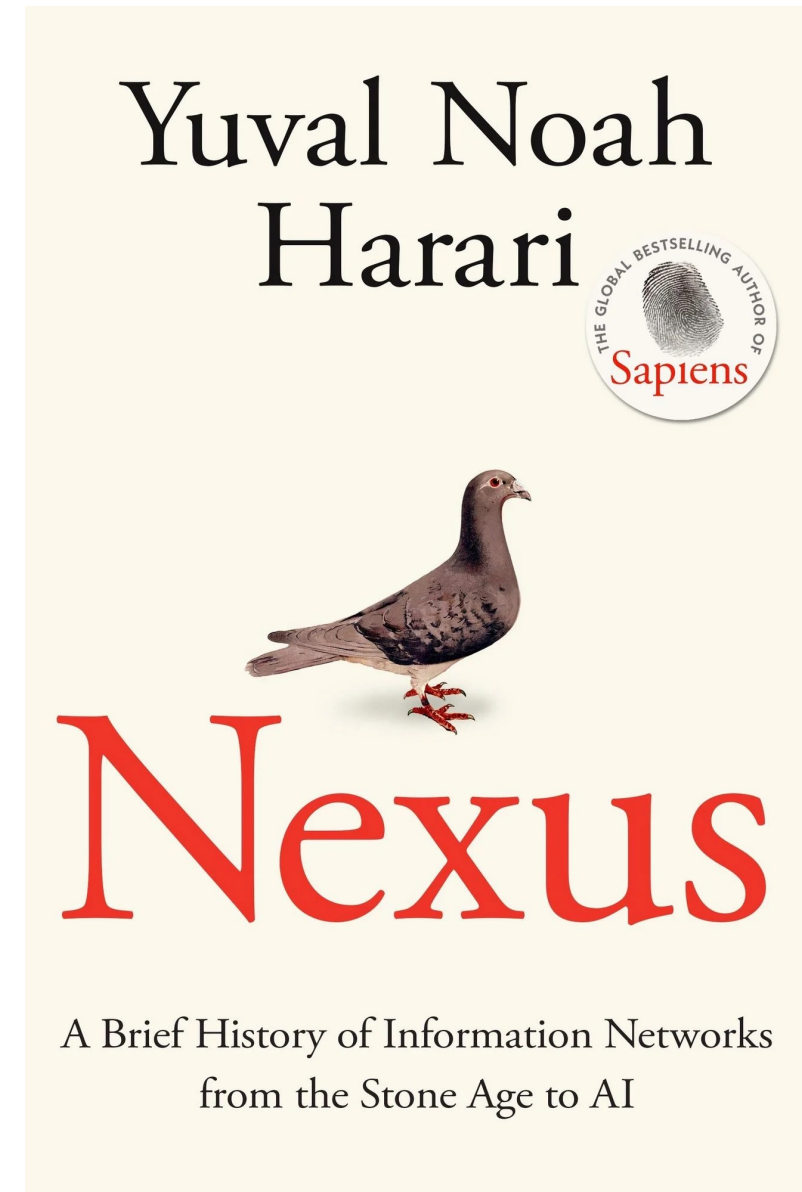
Option	Percentage
kalt	90%
kalt und manchmal	10%

Zur Eingabe

Looking to the Future

- Yuval Noah Harari, 2024: Nexus
 - „Technology only creates new opportunities; it is up to us to decide which ones to pursue.“

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References

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