CENTER FOR UNDERVISNINGSMIDLER

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Negative numbers and chatbots

Bridging mathematics and technology for deeper learning
Riga conference

New curriculum context in Denmark

- In Denmark new national curricula for primary school will be introduced in 2027
- One ambition is to integrate digital literacy into subjects such as mathematics
- This includes helping students understand and critically engage with digital technologies, including AI

The teaching sequence

- The activities we will try today come from a teaching sequence designed for grade 6 students (around 12 years old).
- The sequence was written by Bo Kristensen and explores how AI and chatbots can support learning about negative numbers.
- It consists of three double lessons (3 × 90 minutes).

Overview of the teaching sequence

Lesson 1 – Exploring negative numbers	**Lesson 2** – Chatbots as learning partners	**Lesson 3** – Reflection and mathematical meaning
• Introduction to chatbots • Concept map about negative numbers • **Walk & talk with a chatbot** ⭐ • Individual tasks on negative numbers	• **Compare different chatbots** ⭐ • Discussion: AI for learning – not cheating • **Design your own teacher chatbot** ⭐ • **Guess the prompt**	• Discussion with a historical mathematician chatbot • Portfolio explanation of negative numbers • Reflection on using AI in mathematics • Revisit concept map

Goals

The teaching sequence has three goals.

1. Students learn **how to prompt a chatbot**
2. Students learn how generative AI can be used for **learning – not cheating**
3. Students develop an understanding that **a chatbot builds its responses based on the information it is given**

In this workshop you will try three activities – one for each goal.

Activity 1

Walk & talk with Villy

- In the classroom students first talk to a chatbot about negative numbers.
- Not to get answers – but to notice mathematics around them.

Go to **geogebra.org** and join the lesson:

YSU6 E4D6

2 minutes

Did the conversation help you notice negative numbers in everyday situations?

2 minutes

What examples did you think of?

Activity 2

Compare chatbots

- This activity is about AI for learning – not cheating.
- Students compare different chatbots.

2 minutes

Which chatbot helped you think the most – 1, 2, or 3?

Activity 3

Design a learning chatbot

- The final activity shows how chatbot behaviour depends on the prompt.
- Students design their own teacher chatbot.

You need to log in or create a free account at **schoolhub.ai**

Create a SchoolHub account

Go to

schoolhub.ai

Log in or create a free account.

If you prefer, you can work together with someone who already has an account.

Create and share a chatbot

1. Write a system prompt
2. Generate your chatbot
3. Copy the share link

Activity 3 | Build a chatbot // Guess the prompt

Now test another chatbot.

Try to guess:

- How does the chatbot respond to students' questions?
- How does it ask follow-up questions or ask for clarification?
- What is the chatbot's personality like?

Final reflection

What would students need to learn to use chatbots well in mathematics?

Thank you

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📂 **Workshop materials (GeoGebra)**
geogebra.org/m/dkm6nxag