Hands-On Exercise

**Time:**

* 10 minutes to explain the process and let them settle in
* 30 minutes to produce the poster
* 10 minutes to give feedback

**Materials needed:**

* Flipover paper
* Markers
* Sticky notes
* Printed guiding questions (one set per group)

## Instructions for Teachers

1. **Introduction (10 minutes)**
   * Explain the activity, timeline, and materials.
   * Introduce the four topic options: **Data, AI Infrastructure, Models, MLOps**.
   * Hand out guiding questions (printed for each group).
2. **Group Formation**
   * Ask students to pick their preferred topic.
   * Form teams of up to **6 students** each (avoid larger groups).
3. **Poster Creation (30 minutes)**
   * Remind teams to go through the **four stages**:
     + **Analysis**: Use the guiding questions to perform research and share knowledge as a group.
     + **Design**: Decide the *main message* of the poster.
     + **Implementation**: Create the poster on flipover paper with markers.
     + **Validation**: Prepare to receive feedback.
   * Ensure students focus on clarity and key messages, not on copying all information.
4. **Feedback Round (10 minutes)**
   * Each team leaves **one member at the poster** to explain it.
   * The rest of the team visits other posters and leaves feedback with sticky notes.
5. **Wrap-up**
   * Collect insights and highlight key takeaways from each topic.

# Instructions for Students

1. **Choose Your Topic**  
   Pick one of these: **Data, AI Infrastructure, Models, MLOps**.  
   Each topic gets a set of questions.

Join a group of the same topic (maximum 6 people).

1. **Work Together on a Poster (30 minutes)**
   * Follow these **stages**:
     + **Analysis**: Read the questions you get, discuss, and gather ideas as a team.
     + **Design**: Decide the *main message* for your poster (don’t try to include everything).
     + **Implementation**: Use the flipover paper, markers, and sticky notes to create the poster.
     + **Validation**: Be ready to present your work and gather feedback.
2. **Present & Give Feedback (10 minutes)**
   * Leave **one person at your poster** to explain it.
   * The rest of the team walks around, listens to other posters, and gives feedback with sticky notes.
3. **Final Step**
   * Rejoin your group, read the feedback, and reflect on what you learned.

**You will have:**

* 10 minutes for setup and instructions
* 30 minutes to create the poster
* 10 minutes for presentations and feedback

# Data

**Definition:** AI learns from data; the quantity and quality of data determines AI performance.

**Professional relevance:** Companies rely on accurate, diverse, legal data for applications like recommendations, predictive maintenance, or fraud detection.

**Questions:**

* Find examples of biased or incomplete datasets in practice and their impact on the businesses and people?
* **Hands-on practice:**
  + Explore datasets on [**Kaggle**](https://www.kaggle.com/datasets).
  + Find three different interesting datasets and explain why you liked them.
  + What is the biggest dataset you could find on Kaggle
* **Career exploration:**
  + Search LinkedIn for “Data Engineer” or “Data Analyst.” What is their main difference?
  + List the main differences in their responsibilities, what tools do they use?
* Which kind of data is being collected about you via your favorite apps?

# Infrastructure

**Definition:** The **storage, computing power, and pipelines** that allow AI to run at scale. Without infrastructure, models can’t be trained, deployed, or used effectively.

**Professional relevance:** Engineers ensure AI runs efficiently on cloud/on-premise infrastructure while maintaining performance.

**Questions:**

* List skills and responsibilities for deploying and maintaining AI infrastructure, and which companies hire them?
* What are the main Cloud providers? What certificates can you obtain?

Extra (use reputable sources for this):

* What is a GPU and why we need it for training AI?
* How many GPU-Hours is used to train a large language model?
* What is the Co2 emission of training a language model?
* How much water is used for cooling?
* What is the operation cost of OpenAI?

If you like **embedded systems**, you can look into these:

* What is Tiny-ML?
* What is AI on the edge? Can I run AI on a Raspberry Pi?

# Models

**Definition:** Algorithms that learn patterns from data to predict or generate outcomes.

**Professional relevance:** Models power applications like recommendation systems, spam detection, and generative AI.

**Questions:**

* What happens if models are biased or produce errors?
* Look into HuggingFace and find open-source models. What kind of models can you find?
* What is a benchmark, and what is a leaderboard?
* Find cases in the news where algorithms were misused or created unintended consequences in the Netherlands. How could this be avoided?
* Search LinkedIn for “Machine Learning Engineer” or “AI Developer.”
* List skills (Python, TensorFlow/PyTorch, data preprocessing) and responsibilities (training, evaluating, and deploying models).

# MLOps

**Definition:** Processes and tools to deploy, monitor, and update models safely in production.

**Professional relevance:** Ensures AI models work reliably over time and in real-world conditions.

**Questions:**

* What happens if a model is outdated or fails in production?
* Search LinkedIn for “MLOps Engineer” or jobs that have MLOps engineering in their definition. What kind of companies hire them?
* List skills (CI/CD, monitoring, model versioning) and responsibilities (deploying, monitoring, updating models).