AI4 WASTE

FOSTERING AWARENESS AND INNOVATION IN ADULT EDUCATION

2023-2-PT01-KA210-ADU-000184346

TOOLKIT

GROUP DYNAMICS:

DESIGNING AI FOR THE PLANET

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Index

SUMMARY 4
GROUP DYNAMICS: "DESIGNING AI FOR THE PLANET" 5
EVALUATION QUESTIONNAIRE 8
EVALUATION QUESTIONNAIRE: ANSWERS 10

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SUMMARY

The document "Group Dynamics: Designing AI for the Planet" helps environmental professionals and the community understand how AI can be used to solve environmental and sustainability problems. It explains basic ideas like big data, algorithms, computing power, and explainable AI (XAI). It also includes a short quiz with answers to check understanding and support learning for both professionals and community members.

GROUP DYNAMICS: "DESIGNING AI FOR THE PLANET"

Objective:
To help environmental professionals understand how artificial intelligence (AI) can be used to solve ecological and sustainability challenges — by applying key AI concepts like big data, algorithms, computing power, and explainable AI (XAI).

Structure:
•Target Group: Environmental scientists, engineers, policy makers, sustainability officers, or students in environmental studies
•Group Size: 4–6 participants
•Time Needed: 60–75 minutes
•Materials: Flipcharts, markers, or online collaboration tools like Miro, Jamboard, Google Slides

Facilitator's Prep (5–10 mins):
Quick Review of Concepts:
• What is AI? A system that mimics human thinking to learn, recognize patterns, and make decisions.
• AI Needs: Data (especially big data), algorithms, and computing power (like GPUs, TPUs).
• XAI: Explainable AI is essential for transparency, especially in fields like environmental monitoring or public policy.
• Big Data in the Environment: Satellite imagery, climate models, air and water sensors, biodiversity records, etc.

Challenge Brief
Each group acts as an AI-for-the-Environment Task Force. Their mission:
"Design an AI system to solve a major environmental challenge using the concepts from today's session."
They can choose from the following real-world problems (or propose their own):
1. Wildfire detection and prevention
2. Smart water quality monitoring
3. Predictive models for agricultural sustainability
4. Climate change risk analysis and forecasting
5. Protecting endangered species using AI-powered camera traps
6. Urban air quality tracking and improvement recommendations

Group Work Guidelines (30–40 mins):
Each group answers and presents the following:

1. Problem & Solution:
•What is the environmental issue?
•How will AI be used to address it?

2. Data Sources:
• What types of data will you need? (e.g., satellite data, sensor readings, weather records, citizen science reports)
• How will this data be collected and processed?

3. Learning & Algorithms:
• How will the AI learn?
• Will it use supervised learning, unsupervised learning, NLP, or another method?
• What kind of patterns or decisions is it expected to make?

4. Computing Resources:
• Will it need GPUs or TPUs for complex modeling?
• Will it run on the cloud or edge devices (e.g., in remote sensor locations)?

5. Explainability & Trust (XAI):
• How can stakeholders (scientists, policy makers, public) understand the AI's decisions?
• How will you communicate predictions or risk assessments?

6. Ethics & Impact:
• Are there privacy, equity, or bias concerns in the data?
• What could go wrong if the system fails or gives inaccurate predictions?
• How will the system improve sustainability?

Presentation & Debrief (15–20 mins):
Each group presents their proposed AI solution (5 mins each).
The facilitator or peers ask questions like:
• Is the solution realistic and scalable?
• What are the biggest data or ethical challenges?
• How could this solution be deployed in real environmental work?

Learning Outcomes:

By the end of this activity, participants will:

- Understand how AI can be applied directly to environmental and sustainability challenges
- Identify the data and computational requirements of real-world AI projects
- Recognize the importance of explainable and ethical AI in high-impact fields
- Gain hands-on experience designing an AI-driven solution in a collaborative setting

EVALUATION QUESTIONNAIRE

1. Can AI be used to detect environmental risks in real-time using sensor data?

- ☐ Yes
- ☐ No

2. Which of the following is NOT a core component of AI?

- ☐ Algorithms
- ☐ Data
- ☐ Solar Energy
- ☐ Computing Power

3. Does 'Explainable AI (XAI)' help us understand how an AI system made a decision?

- ☐ Yes
- ☐ No

4. Big data enhances AI model performance by providing:

- ☐ Limited sample sizes
- ☐ Diverse and high-volume datasets
- ☐ Manual rules only
- ☐ Reduced computing power

5. Can AI-powered image recognition systems assist in wildlife conservation?

- ☐ Yes
- ☐ No

6. Which computing resource is optimized for training deep learning models?

- ☐ CPU
- ☐ GPU
- ☐ Hard Drive
- ☐ RAM

7. Does AI require human programming of every step in its decision-making process?

- ☐ Yes

☐ No

8. Is Natural Language Processing (NLP) a branch of AI used for understanding human language?

☐ Yes

☐ No

9. Can AI help personalize environmental education based on user behavior?

☐ Yes

☐ No

10. Does increasing computing power enable faster and more accurate environmental modeling using AI?

☐ Yes

☐ No

EVALUATION QUESTIONNAIRE: ANSWERS

1. Can AI be used to detect environmental risks in real-time using sensor data?
✅ Yes

2. Which of the following is NOT a core component of AI?
✅ Solar Energy

3. Does 'Explainable AI (XAI)' help us understand how an AI system made a decision?
✅ Yes

4. Big data enhances AI model performance by providing:
✅ Diverse and high-volume datasets

5. Can AI-powered image recognition systems assist in wildlife conservation?
✅ Yes

6. Which computing resource is optimized for training deep learning models?
✅ GPU

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7. Does AI require human programming of every step in its decision-making process?
✅ No

8.Is Natural Language Processing (NLP) a branch of AI used for understanding human language?
✅ Yes

9. Can AI help personalize environmental education based on user behavior?
✅ Yes

10. Does increasing computing power enable faster and more accurate environmental modeling using AI?
✅ Yes