EducationforClimate Youth Climate LAB 2
How to approach AI and climate change in learning communities

Practical recommendations

The following practical recommendations have been co-created during the [EducationForClimate Coaliton's 2024 Youth Climate Lab](#).

About

Title

AI for Earth: Mission Climate – Integrating AI and Climate Change in Educational Scenarios

Summary

This document outlines practical recommendations and introduces a pilot workshop, developed as part of the European Youth Climate Lab on AI and Climate Change. The goal is to demonstrate how AI can be embedded in educational environments to enhance students' understanding of climate change and foster critical thinking, ethical reasoning, and interdisciplinary collaboration. The proposed all-encompassing activity, "AI for Earth: Mission Climate," serves as an innovative tool for engaging students in AI-driven climate action, combining gameplay with real-world learning outcomes.

Keywords

AI, Artificial Intelligence, Climate Change, Education, Climate Lab, Sustainability, Practical Recommendations

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Introduction

The Youth Climate Lab centred around the use of AI to tackle Climate Change and raise awareness about this topic through educational activities and learning communities. The main issues identified during the LAB lie in the inexperience of dealing with AI and the scarce awareness of how to use such an innovative tool. In fact, the main

reasoning at the core of the foundations is that AI has paramount potential in addressing climate-related problems on all fronts, but its use must be conducted with knowledge of its limits (transparency of algorithms, cultural biases, disinformation, etc.). Hence, the LAB aimed at producing practical recommendations following both climate science as well as social and behavioural sciences. For instance, the COM-B and EAST models were employed to ensure the effectiveness of the proposed activities and drive educational best practices. In light of the above, six recommendations were formulated in the structure of a problem identified and a specific challenge/activity to overcome it or simply become aware of it. The recommendations outlined have been finally embedded in an overall learning lab designed to engage students in a comprehensive exploration of how AI can contribute to understanding and mitigating climate change.

Recommendation 1
How can AI-powered climate models be integrated into classroom activities to enhance students' understanding of climate change?

AI-driven climate modelling *can be a powerful tool for helping students understand the dynamics of climate change. By incorporating AI tools that analyse environmental data and predict future climate conditions, educators can provide students with a hands-on learning experience that reinforces the importance of data in climate science.*

Activity 1
Develop a lesson plan where students use AI software to simulate the impact of different environmental policies on their local ecosystem. Incorporate AI tools that model climate scenarios based on real-time data into science classes. Students could work on projects where they input local environmental data and use AI to predict future climate conditions. This can help them grasp the dynamic nature of climate change and the role of predictive modelling.

Level of difficulty:
Medium

Recommendation 2
How can AI enhance the delivery of climate change education through personalized learning experiences?

AI-assisted climate change education platforms are the perfect tool to make education inclusive and accessible to all. A mix of self-guided learning and collaborative projects, with AI providing feedback and additional resources based on student performance, can guide students towards personalised awareness of the issues at stake.

Activity 2
Design a learning scenario where students use an AI-powered platform to explore climate change topics at their own pace. Use AI-driven educational platforms that offer personalized learning paths based on students' progress and interests in climate science. This could include interactive simulations, tailored reading materials, and adaptive quizzes that help students explore different aspects of climate change.

Level of difficulty:
Medium

Recommendation 3
How can AI tools be used to teach students about the intersection of climate change and social justice?

Understanding AI's role in addressing climate justice is crucial. Educators should emphasize the intersection of AI, climate science, and social equity, helping students explore how AI can be used to identify and address climate vulnerabilities in different regions.

Activity 3

Create a scenario where students use AI to map climate impacts on vulnerable populations. Integrate AI tools that analyze global climate data with a focus on how climate change disproportionately affects different regions and communities. This could lead to a group project where students propose solutions or advocacy campaigns based on their findings, integrating social justice with climate science.

Level of difficulty:
Medium

Recommendation 4
How can discussions about AI ethics be embedded into climate change education?

Ethical considerations are crucial when using AI to address climate change. Educators should integrate discussions on AI ethics into their curriculum, helping students think critically about the implications of AI in environmental science and beyond.

Activity 4
Design a debate-based learning scenario where students explore different ethical issues related to AI and climate change. Introduce classroom debates or workshops focused on the ethical implications of using AI to address climate change. Topics might include the environmental impact of AI itself, bias in AI algorithms, or the equitable access to AI technologies in climate action. This scenario could involve research, discussion, and a final presentation or essay where students articulate their positions on these complex issues.

Level of difficulty:
Easy

Recommendation 5
How can AI be used by students to create effective climate change awareness campaigns?

AI can be a powerful tool for raising awareness about climate change. By teaching students to use AI-driven tools for campaign development, educators can help them create effective, data-driven strategies that reach diverse audiences.

Activity 5
Develop a learning scenario where students create and run an AI-powered social media campaign focused on a climate issue. Students can use AI tools to design and optimize climate action campaigns, such as social media strategies or content creation that targets specific audiences. AI could help analyse audience data, optimize content distribution, and measure campaign impact. The scenario could include planning the campaign, using AI tools to analyse engagement, and reflecting on the effectiveness of their strategies.

Level of difficulty:
Easy

Recommendation 6
How can AI facilitate interdisciplinary learning and collaboration between students studying climate science and other subjects?

Climate change encompasses a wide array of disciplines. AI is the only tool that offers a blended combination of all , by selecting high quality contributions from different perspective. In order to be taught how multifaceted the phenomenon is, students should implement this multidisciplinarity in their approach to AI and Climate Change.

Activity 6

Create an interdisciplinary learning scenario where students from different subject areas collaborate on a climate project using AI. Use AI tools to integrate climate science with subjects like economics, geography, or political science. For instance, geography students might map climate impacts while economics students assess the financial implications, all facilitated by AI tools.

<u>Level of difficulty:</u>
Medium

Overall practical example

Climate Lab / Workshop: "AI for Earth: Mission Climate"
"AI for Earth: Mission Climate" is a comprehensive learning activity that integrates all the above recommendations and activities. Students work through various levels, each focusing on a different aspect of AI's role in combating climate change. The game culminates in a Global Summit, where students collaborate to create a holistic AI-driven climate action plan. This scenario not only educates students about AI and climate change but also develops their teamwork, critical thinking, and ethical reasoning skills.

The proposed Lab is intended as either a virtual game or, for more engagement, as a in-person one-week lab featuring workshops, lectures and practical activities. Young students would there enhance their knowledge of AI and Climate Change while collaborating on challenging tasks and solving complex problems together.

Workshop Week Structure:
1. Introduction & Group Creation:
Students are assigned a group based on selected different roles such as Environmental Scientist, AI Specialist, Climate Activist, or Policy Maker. Each role will have unique abilities and challenges.

The week begins with an introductory video explaining the impact of climate change on Earth and how AI can be a tool for positive change.

Day 1: Climate Modelling & Prediction
Students must collect environmental data from different regions, including data on local temperatures, CO2 levels, deforestation rates, energy consumption, and biodiversity. Students input this data into the AI-powered climate model and choose different environmental policies to simulate. Options might include implementing strict carbon taxes, transitioning to renewable energy, reforestation programs, or reducing industrial emissions.

Day 2: Climate Justice
Students analyse data to identify regions and communities most vulnerable to climate change. They must then allocate AI resources to these areas to mitigate impacts. The have to ensure equitable distribution of AI tools and resources, focusing on climate justice. Students must navigate ethical dilemmas, such as prioritizing resources in regions with differing levels of impact and access to technology.

Day 3: AI Ethics
Students face ethical challenges related to AI usage, such as bias in data, environmental costs of AI technologies, and privacy concerns. They must debate these issues and make decisions that balance technological advancement with ethical considerations. They must successfully navigate the ethical challenges to maintain public trust and ensure responsible AI use.

Day 4: Climate Action Campaign
Students use AI tools to design and launch a climate change awareness campaign. They must create content, optimize social media strategies, and measure the impact of their campaign. They should achieve the highest possible engagement score by effectively using AI to raise awareness about climate change. Students must tailor their campaign to different demographics, understanding how AI can be used to target specific audiences.

Final Day: The Global Summit
All students come together in a virtual Global Summit to present their findings, solutions, and the impact of their actions in the workshop. The summit includes a roundtable discussion where players reflect on what they've learned about AI and climate change, and how these lessons can be applied in the real world. The final plan must be balanced, considering climate science, AI ethics, energy efficiency, and climate justice. Students must reach a consensus, emphasizing teamwork and compromise.

Conclusion

The European Youth Lab on AI and Climate Change has demonstrated the immense potential of integrating AI into educational environments to enhance students' understanding of climate dynamics. The LAB's activities, particularly the development of the overall activity "AI for Earth: Mission Climate," have showcased how AI-powered tools can be effectively used to simulate real-world scenarios, foster critical thinking, and promote ethical reasoning among students. Through this initiative, it has become clear that AI is not just a technological advancement, but a vital tool in empowering the next generation to address the pressing challenges of climate change. The LAB has laid a strong foundation for future educational initiatives that aim to combine technology with sustainability, ensuring that students are prepared to face the global challenges of the 21st century.

To continue the momentum generated by this LAB, the next steps involve piloting the "AI for Earth: Mission Climate" game in schools and educational institutions across Europe. Potential partners could include eco-schools and institutions involved in sustainability education, such as the Eco-Schools program or schools within the UNESCO Associated Schools Network (ASPnet).
Additionally, we plan to promote this project through various networks, including educational conferences, environmental forums, and digital platforms dedicated to AI and climate education su. The initiative could be presented at major educational conferences such as BETT (British Educational Training and Technology) or the European Conference on Educational Research (ECER). Beyond the E4C Day 2024, we will seek collaborations with educators, policymakers, and tech companies to expand the reach of this initiative and integrate its principles into broader educational curricula. We propose to engage with the European Commission's Directorate-General for Education, Youth, Sport, and Culture (DG EAC) and other relevant bodies to advocate for the integration of AI-driven climate education into national curricula. Seek to include the initiative in EU-funded projects and programs focused on education and climate action.

For those reading this document, the next steps are clear: take the ideas, recommendations, and activities outlined here and implement them within your own educational environments. Whether you are an educator, a school administrator, or a policymaker, you have the opportunity to make a significant impact by integrating AI into climate education. Start small, perhaps by introducing AI-driven climate modelling in your classroom or organizing workshops on AI ethics in environmental science. Collaborate with others in your network to share resources, strategies, and successes. By doing so, you contribute to a growing movement that empowers students to use technology as a force for good, preparing them to tackle the critical environmental challenges of our time.