RESET AN AEOP EFFORT aeop | Bias in Artificial Intelligence (3-5 days)

Authors.

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SUBJECT/GRADE LEVEL.

Subject Area:

- Science
- Technology

Grade Level:

- High School

Materials:

- Print copies of resources for each student
  - Student Resource
  - Discussion Questions
  - Team Rating
  - Exit ticket
- List of materials needed for the activities.
  - Chromebooks/ Computer
  - Calling stick

STANDARDS.

Next Generation Science Standards

- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

Mathematics Standards | Common Core State Standards

- MP.2 Reason abstractly and quantitatively. (HS-ETS1-1),*(HS-ETS1-3),(HS-ETS1-4)*

English Language Arts Standards | Common Core State

- RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. (HS-ETS1-1),*(HS-ETS1-3)*

LESSON OBJECTIVE(S)

Artificial intelligence is the applications of technology to create and do tasks that look like human cognitive function and it's ability and capability of a machine to imitate intelligent human behavior. There is bias in AI that occurs when an algorithm produces results that are systemically prejudiced due to erroneous assumptions in the machine learning process. The main reason for AI bias lies in human prejudice- conscious or unconscious- lurking in AI algorithms throughout their development. There are also ways to prevent AI bias from creeping into your models. Students will research, reflect and remonstrate bias in artificial intelligence and ways to prevent AI bias from creeping into models as they collaborate with their group.

CAREER CONNECTION(S)

Mentor Background: Dr. Benjamin D. Nye is the Director of Learning Sciences at USC-ICT. Ben's major research interest is to identify best practices in advanced learning technology, particularly for frontiers such as distributed learning technologies (e.g., cloud-based, device-agnostic) and socially-situated learning (e.g., face-to-face mobile use). His research interests include modular intelligent tutoring system (ITS) designs, modeling social learning and memes, cognitive agents, and educational tools for the developing world and low-resource/low-income contexts.

STEM Careers: Data Analytics: Finding meaningful patterns in data by looking at the past to help make predictions about the future. Other STEM Careers: Research Scientist, Software Engineer, AI Engineer, Data Mining and Analysis, Big Data Engineer/Architect, Education and Business Intelligence (BI) Developer

ENGAGEMENT

Brief Description: Students answer questions in groups eliciting misconceptions and gaps in knowledge about AI.

Classroom	Teacher /Student will
Teacher Actions: Before class make sure you have introduced AI in class and that the students know the meaning of AI and its applications. ● Place students in groups and ask them to discuss the following questions: ○ Does artificial intelligence have a bias? ○ What could be an unintended consequence of AI? For example, maybe it could be helpful and used in a different way to solve another problem. Or, maybe it could have unintended consequences that could be harmful to users. ● Give students time (2-4min) to discuss and collaborate with their group before sharing in class as they come up with their own idea using their imaginations or drawing from personal experiences. ● Ask them to share their answers. Use focus questions to clear any misconceptions ● Explain that bias in AI systems is often seen as a technical problem, but the NIST report acknowledges that a great deal of AI bias stems from human biases and systemic, institutional biases as well.AI systems can exhibit biases that stem from their programming and data sources; for example, machine learning software could be trained on a dataset that underrepresents a particular gender or ethnic group.	**Student Actions/Students will:** 1. Actively participate in discussion and answer the provided questions 2. Share with the class **Teacher Actions:** 1. Teacher will “move” from one group to another to assist/check on students. 2. Explain and clear any misconceptions

EXPLORATION

Brief Description: Students will demonstrate their understanding of AI Bias through research and group discussion.

Classroom	Teacher /Student will
At the beginning of class: ● Distribute **Student Resource** and have students log into a computer to begin researching ● Explain to students that they will answer all the questions in complete sentences as they research **Check for understanding as they progress with their research:** ● Bring student back from their research and **post these question** on the board	**Teacher** Distribute **Student Resource**. Explain the task at hand and move around to make sure that students are on the right track.

• Give students 5 minutes to discuss the questions in their various groups • As students are collaborating move around to make sure everything is going as expected and that they are on task. • Use this opportunity to ask some focus questions and clarify some misconceptions. • After 5 minutes give them time to share in class either using a calling stick or calling by group to share. Be the facilitator, and lead them to the answer. During the discussion, have students add to their notes.	**Students** Students will discuss/reflect each question on **Student Resource** and take note of the main concepts.

EXPLANATION

Brief Description: Students will share their research through gallery work and allow the teacher to clear any misconceptions students may have.

Classroom	Teacher /Student will
• After the research, students will do a **gallery work** presentation. • After the gallery work each group will present in class and use this time to facilitate and clear any misconceptions using focus questions. • EXIT TICKET: Have each group come up with ONE question they still have regarding bias in AI.	**Student** Work on the assignments gallery work. **Teacher** clear any misconceptions during their presentations and gallery work

ELABORATION

Brief Description: Students will create an infographic on “Bias in AI”.

Classroom	Teacher /Student will
• Using the Exit Ticket, the teacher will guide students in discussion. • Give students time to update their research worksheet • Using a platform of choice (ex. Google Draw, Canva), each group will create an infographic based on their research and discussion on “Bias in AI”.	**Teacher** Explain main concepts **Students** Take note and update their research paper. Create an infographic.

EVALUATION

Brief Description: Students will peer review infographic.

Classroom	Teacher /Student will
• Students will then be given opportunity to ○ rate 2 other teams reflection as peer review using Team Rating worksheet. • Student will give individual answer question as an an exit ticket where students can describe the AI Bias and how to fix it and this will help determine how well students were able to research bias in AI.	**Teacher** Divide the class so that each infographic has an equal number of rater. **Students** Use the rating worksheet to provide feedback on assigned infographic. Answer exit ticket.

REFERENCES

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- **Why is AI Important?** https://csuglobal.edu/blog/why-ai-important
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