Integrating AI Learning into Middle School Science through Natural Language Processing

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Project Overview: Project IntegrateAI is supporting middle school teachers in bringing authentic, inquiry-based natural language processing (NLP) experiences into science classrooms. For students, the project will provide innovative experiences that foster competencies and attitudes toward STEM careers.

Early-stage workshops with teachers suggest that AI and NLP hold great promise for middle school learners to engage with textual data around science inquiry and ethics.

Lessons Learned & Insights Gained

- Summer and Fall 2022 have seen development of a novel curriculum for teachers that includes
  - Fundamentals of NLP
  - Inquiry-based learning in science
  - Hands-on practice with NLP tools
- We have identified desired characteristics for a learning platform that will be suitable for middle school learners to meaningfully engage with NLP in science classes
- Fall 2022 will see the first series of co-design workshops with teachers coupled with professional development

Equity

- Gathering a team of middle school science teachers and identifying potential opportunities to make AI learning accessible to all students.
- Focusing on societal impacts of AI and presenting real-life cases for the importance of teaching NLP with ethics and ethical reasoning at the forefront.
- Providing continuous support to teachers in the early stages of implementing AI learning activities in for a diverse range of learners

Challenge

- Need for authentic learning activities that will engage all students in AI and science learning
- Existing NLP learning platforms are limited and may not be developmentally appropriate for middle school students
- There is no existing NLP knowledge assessment designed for middle school students

Next Steps

- Co-designing learning activities with teachers that will be socially and culturally relevant to students
- Creating a new NLP learning platform in which students engage in socially and personally relevant science inquiry as a starting point
- Examining existing validated AI knowledge assessments and develop new instruments to evaluate students’ AI learning and ethical reasoning about AI