# Integrating AI Learning into Middle School Science through Natural Language Processing

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Project type: Developing and Testing Innovations (DTI)

Project URL: http://learndialogue.org/project.php?id=IntegrateAI

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*
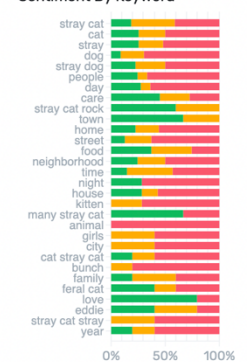


## Equity

- *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 | Next Steps |
|---|---|
| *Need for authentic learning activities that will engage all students in AI and science learning* | *Co-designing learning activities with teachers that will be socially and culturally relevant to students* |
| *Existing NLP learning platforms are limited and may not be developmentally appropriate for middle school students* | *Creating a new NLP learning platform in which students engage in socially and personally relevant science inquiry as a starting point* |
| *There is no existing NLP knowledge assessment designed for middle school students* | *Examining existing validated AI knowledge assessments and develop new instruments to evaluate students' AI learning and ethical reasoning about AI* |