

## Overview

The goal of this project is to explore and evaluate the usage of large and small language models (LLMs and SLMs) for the creation of high-quality, standards-aligned content and supports through the development of the Promotion of Resilient Opportunities Designed for Understanding and Creative Thinking through Individualized Vicissitudinous Experiences (PRODUCTIVE), an AI-powered web application. PRODUCTIVE, set to be freely available to teachers, will enable teachers to create and modify engaging math problems, receive possible solutions and prepare for what may come in students' responses (e.g., common errors, misconceptions, and points of failure), organize student groups for collaboration, and facilitate discussions to develop canonical responses. PRODUCTIVE generates complex math problems tailored to students' prior knowledge, the new topic, and their interests using generative AI technology, accompanied by relevant text to make the problems engaging and accessible. The application will also use AI to assess and enhance students' collaboration and creativity while providing real-time support to both teachers and students during and after the problem-solving process.