Meridio: A synchronous collaborative learning platform for middle school math word problems

Abstract

For public release

This project addresses the acute need for a STEM-trained workforce for the Nation in general and for the United States Air Force (AF) specifically. We will create a system prototype for Meridio (Greek for "share"), a powerful web-based system for middle-school students to solve math problems together with social media-like interactions. Importantly, we enable teachers and the AF to work together in developing relevant real-world problems to spark student interest. Our holistic systems approach addresses student, teacher, and AF needs simultaneously.

The Meridio project is based at the University of Southern California (USC), in partnership with the University of California Riverside (UCR) and Kent State University (Kent State) led by an interdisciplinary team drawn from systems engineering, social sciences, and education research. We will develop a customized, real-world curriculum relevant to AF needs by adapting the backend of an existing open-source, web-based platform. We will collaborate with teachers, students, and AF ROTC cadets to design classroom workflows for the pilot. This award will fund the education project lead, collaborating teacher stipends for a pilot proejct, and undergraduates to support software development team.

Students, teachers, and AF ROTC cadets will co-design relevant examples. For teachers, Meridio provides an easy interface, real-time dashboard, and self-paced professional development so they can better support students in mastering math concepts. The AF can participate in curriculum brainstorming and in the classroom to provide a relevant context. We combine number responses and text analysis for data-driven insight toward better performance and more meaningful experiences in math education. This project meets USAF goals:

1. Inspire community engagement in DOD STEM by including teachers, students and AF personnel in curriculum co-creation.
2. Attract the STEM workforce to DOD via participation in the curriculum co-creation, and by inviting DOD personnel (AF ROTC cadets) to test sessions.
3. Increase underserved participation by piloting the exercise in communities including Los Angeles; Riverside, CA; and Kent, OH - all of which have populations underrepresented in STEM.
4. Improve the effectiveness of STEM education by creating a system that engages students, coupled with a system that collects data for evaluation and assessment.