

UCSD ECE 191 Project- Spring 2009

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Service oriented math education (SOME)

Project

The objective of this project is to specify and develop a service oriented math education package. The package consists of hardware, software, documentation and support to enable middle or secondary math classes to conduct an experiment to evaluate the benefits of the computer service oriented math education (SOME) approach to learning.

Objective -

Make Middle and High School Math education fun and engaging.

Make Acquiring Math Skills Relevant and Social.

Focus on Retaining Students in Math programs.

Approach -

Use digital Video technology to engage students and capture students' math progress and skills.

Exploit Digital Video to support Math Learning

Enable USB storage of instructor and student math instruction and homework.

Enable Secure WEB based Access/Storage for On-line review by /of students and parents.

The SOME package will enable a teacher to video record lesson materials and enable students to video record solving practice problems and store these materials on individual USB storage media to allow replay to support home study and review.

A web site will allow students to share and collaborate.

The team will set up an experiment with two middle or secondary school math classes over a few weeks. For example, one week, one class uses traditional approach while other class uses SOME. The next week classes switch. Ideally a quiz can be given at end of each week to measure learning. A survey will be conducted to collect feedback on SOME approach.

The SOME prototype will include the following components and related software:

- Laptop including Operating System, Network Interfaces, Device Interfaces, Storage.
- USB drives
- Digital Microphones and Video cameras.
- Application Tools- Video Recording/Editing and Production software. Voice to Text software.
- Web Server to Host for Video.

The project will evolve in the following stages:

- Problem definition. A survey will be conducted of literature related to service oriented architectures, situational awareness functions and available system/ simulation software. The team will develop a set of specifications for a demonstration system and test environment including the requirements for SOME, how SOME components communicate and how these interact with system devices and databases.
- System design/integration. Based on the requirements, the team will design and integrate the SOME components.
- System testing. The team will develop, conduct, support and analyze an experiment with local middle or secondary school math classes. The team will develop test plans and procedures and carry out a trial testing SOME in a test school setting.
- Demonstration. The team will demonstrate the SOME.
- Report. The team will summarize the entire evolution of the project in a final report and document all results and components.

Experience Required

Group members should have experience with computer electronics, networks, open source web products, video capture, wireless laptops, hardware/software integration and rigorous testing.