

Project Title: K8 MEMES: K-8 Maritime Education Modules to Engage Students

Project Abstract (Brief Description): This education development project will create entertaining, informative, and STEM promoting "plug-and-play" curriculum learning modules for K-8 educators, using maritime transportation and infrastructure related topics to teach STEM concepts. Coupling music memory, fun STEM theories, and innovative experiential demonstrations into entertaining video learning modules, the objective of this project is to open the door for student excitement in learning of science topics and to develop a new virtual learning paradigm that: 1) excites curiosity, 2) engages alternative cognitive processes, and 3) promotes future engagement in the STEM areas.

Describe Implementation of Research Outcomes - Contributions of the proposed project are immeasurable; however, it is anticipated that excitement for engineering (and STEM fields in general) will increase amongst the participating elementary age children, while making students aware of the importance of maritime transportation infrastructure networks. Providing a tool for elementary educators to excite, entertain, and inform their students, all-the-while coupling with their existing curriculum has the potential to have enormous contribution for the future of maritime transportation knowledge. All video learning modules and gathered data from student focus groups will be summarized in project report updates, to be provided to MarTREC and other project stakeholders at the requested intervals and in a final report the end of the project duration. In addition to the project interim and final reports, the eight video learning modules will be packaged into a cohesive curriculum and provided as a project deliverable. All data (video files, survey data, report files and images) will be documented and stored on CERN's Zenodo server platform for access. Additionally, at least one peer reviewed education focused journal article is expected from the proposed research, with a focus on publishing within high impact education journals.

Impacts/Benefits of Implementation - The proposed project will prepare a graduate student at the University of Arkansas to think critically and develop communication skills through participation in the development of the explanatory and creative learning modules. Every effort will be made to recruit highly qualified students from under-represented minorities to promote diversity within the civil engineering discipline. It is expected that at least one master's student will participate part-time in the project and gain unique experiences related to new approaches to science communication. Close coordination with the USACE on this project will provide additional unique experiences for the students involved, as well as unique learning module content for the k-8 student focus group. On the PI's previous MarTREC 5012 project, graduate student Christine Lozano was recruited during her research studies by the USACE project partners and is now fully employed by the USACE and is available to provide access to unique waterway sites for experiential learning module examples.

Web Links: [martrec.uark.edu](http://martrec.uark.edu)

Budget (Funding) Amounts & Source(s) (US DOT +Match(s) =Total Costs): MarTREC 30,000 and UA \$15,000 = 45,000

Project Start and End Dates: 09/01/21-12/31/23 Complete

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Principal Investigator Institution (University): University of Arkansas