Oral Defense Announcement
University of Missouri – St. Louis Graduate School

An oral examination in defense of the dissertation for the degree
Doctor of Education with an emphasis in Educational Practice

Allen L. Savage, Sr.

M.Ed. in Adult & Higher Education, December, 2017, University of Missouri-St. Louis
M.A. in Inorganic Chemistry, May, 1978, Washington University-St. Louis
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A Mixed Methods Study: The Effects of Mobile Devices & Maker Projects on the Knowledge Base & Interest of African American Middle Schoolers in STEM

Date: April 21, 2021
Time: 1:00 p.m – 3:00 p.m.
Place: Remote

Abstract
The nature of future employment is to jobs rooted in the sciences, technology, engineering, and math (STEM). Educating the current and future workers will require the inclusion of STEM education, especially in the K-12 classrooms. African Americans run the risk of being left behind in future STEM jobs due to their poor STEM representation throughout institutional education. In general, African American students have a poor attitude towards and poor academic performance in STEM. This research explored using ubiquitous smartphones and a unique form of student-centered learning called maker education to increase both the attitude and STEM knowledge of African American middle schoolers. The mixed method approach utilized a pre- post- questionnaire, comprised of three Likert-type scales for Attitude: Interest, Difficulty, and Importance, and a knowledge base multiple-choice portion to investigate the study quantitatively, and direct observation and focus groups to investigate it qualitatively. In this study, 29 African American students from four St. Louis, Mo., middle schools, divided into a group of 24 treatment and one of five control participants. The treatment group completed two maker-ed interventions with smartphones, while the control participants completed two similar interventions without smartphones or maker-ed projects. The qualitative data were thematically coded, and the quantitative data were statistically analyzed for significance. The knowledge base of both the treatment and control groups showed no statistically significant difference, either before or after the interventions, which supported the null hypothesis H1o. The Likert-scales suggested a slight increase in African American middle schoolers’ attitudes in both treatment and control groups, but it was not statistically significant, supporting null hypothesis H2o. The thematic analysis of the observation and focus group data was logically inconsistent with the Likert-scales data in that it suggested a strong increase in attitude in both groups. More research is warranted in this area to increase African Americans in STEM.

Defense of Dissertation Committee
Chairperson - Dr. Keith W. Miller, Ph.D.
Dr. Charles Granger, Ph.D.
Helene Sherman, Ed.D.
Carl J. Bassi, Ph.D.