

## Addressing Misconceptions in Career Selection: Research-based Implementations for STEM Students

**Dan M. Davis & Jennifer H. Nolan**  
Catholic Polytechnic University  
Los Angeles, California  
{ddavis & jnolan} @catholicpolytechnic.org

**Frederica J. Stassi**  
Science Education Consultant  
Lompoc, California  
frjstassi@gmail.com

### ABSTRACT

This paper discusses the response to a long-standing issue, that of the lack of a solid foundation of valid and germane information on which young people can make one of the most important decision of their life: what college major to pursue and what career path to follow. The major issue that is established by previous research is lack of exposure to practicing professionals, the reliance on dramatic-arts' portrayals of the profession and the common assumptions that professionals make that everyone, especially their children, know what they do day-to-day. The authors report on a recently completed study that proposed to provide a prototype of an Artificial Intelligent (AI) agent acting as a conversational mentor to inform student candidates for STEM careers in the service and in civilian life. This was needed due to the shortfalls in STEM professionals to support DoD objectives, as well as bolster civilian technical advances necessary for the defense of the nation. What the researchers found from discussions with the 16 to 18 year-olds was that it was not detailed knowledge of the STEM professional lifestyles, it was an almost total loss of the major parameters of what made up a fulfilling career. The adolescents were too taken by the stereotypes of the professions and by "eye-candy" dreams of a fanciful work experience. The paper then outlines the work on the virtual mentor and explains the dichotomy between the data conveyed and the receptivity of the students. Then the program to ameliorate the missing analytic framework and rectify the gap between that which they should have asked and the questions they really had. Other researchers' efforts and findings, as well as the local team's insights will be added to support the paper's thesis that this effort is both vital and of significant for both this issue and is extensible for other projects focusing on the computer/human interface that now are almost certain to follow. The authors suggest the use of meta-disciplinary approach and outline its value in such situation that call for computer science, behavioral science and system engineering.

### ABOUT THE AUTHORS

**Dan M. Davis, JD** is a Research Associate Professor at Catholic Polytechnic University and is active as a consultant at the Institute for Creative Technologies, University of Southern California (USC), focusing on large-scale DoD simulations and avatar uses. Prior to retirement, he was the Director of the JESPP project at USC for a decade. As the Assistant Director of Advanced Computing Research at Caltech, he ran Synthetic Forces Express, bringing HPC to DoD simulations. He also served as a Director at the Maui High Performance Computing Center and in computer research roles at the Jet Propulsion Laboratory and Martin Marietta. He was the Chairman of the Coalition of Academic Supercomputing Centers and has taught at the undergraduate and graduate levels. As early as 1971, Dan was writing programs in FORTRAN on one of Seymour Cray's CDC 6500's. While in the Marine Corps, he saw duty in Vietnam as a Cryptologist and retired in 2002 as a Commander, U.S.N. He received B.A. and J.D. degrees from the University of Colorado in Boulder.

**Jennifer H. Nolan, PhD**, is the President of Catholic Polytechnic University and Professor of Psychology in their College of Arts and Sciences. Her earlier work specialized in memory, dementias, stroke and insulin resistance. She is a brain plasticity specialist and certified Cogmed provider. Previously, she was the C.O.O. and co-founder of a stroke and brain injury rehabilitation center. Dr. Nolan has taught university courses at the University of California Irvine, Loyola Marymount University, and Glendale Community College. She has conducted local and nationwide clinical trials, and published in both scientific journals and popular magazines. She received a BA in Psychology from Loyola Marymount University, Los Angeles and a Ph.D. in Psychology from the Dept. of Cognitive Science at the University of California, Irvine.

**Frederica J. Stassi, Ed.D.** is a Science Education Analyst, working in the Central Coast of California. Her background includes research for the National Science Foundation in which she was funded to study pedagogies and efficacies in U.S. Science museums. This research involved museums from the East Coast to O'ahu in Hawai'i. Her doctoral research was conducted under the guidance of Professor William McComas and focused on the

development of science standards for the State of California. She received a B.A. degree from Tabor college in Hillsboro, Kansas as well as an M.A. Degree in music performance and an Ed.D., both from the University of Southern California in Los Angeles.