

Stony Brook University The Graduate School

Doctoral Defense Announcement

Abstract

The Role of School Counseling in Student Preparation for Post-Secondary Engineering Study and Careers

By

Richard Gearns

This explanatory sequential mixed-methods study examined the work environment, beliefs, and practices of precollege counselors as they relate to science, technology, engineering, and mathematics (STEM) preparation, postsecondary study, and career attainment. The first phase consisted of surveys of school counselors participating in professional development, while the second involved in depth interviews with a purposively sampled group of counselors. In the quantitative phase, counselors ($N=129$) attended a STEM professional development workshop and approximately half completed post-workshop surveys ($N=68$). Survey findings indicated participant caseloads averaged 254 students, and participants ranked college advising (74%), scheduling (63%), and course advising (49%) as their top responsibilities. Participants often encouraged post-secondary remediation of student STEM credentials or discouraged STEM altogether, and they desired further training regarding various engineering disciplines and career pathways. With respect to underrepresented students, findings showed financial, informational, and cultural constraints in pursuing STEM. Professional development participants improved knowledge of engineering bridge programs, STEM admissions, secondary coursework needed to increase success in post-secondary engineering, and the importance of outreach to promote student interest in engineering.

Using maximum variation sampling, high school counselors ($N=13$) were selected from among survey volunteers to represent a socioeconomically and demographically diverse array of schools. Findings indicated: (1) sociocultural factors were influential in student preparation for STEM, career planning, and decision making; (2) students' STEM-related career goals and academic behaviors were sometimes misaligned, and counselors described ways in which their practices mediated this tension; (3) counselors' professional STEM knowledge base, beliefs, confidence, and practices were influenced by professional preparation, workplace characteristics, and their own academic experiences; (4) professional development proved useful to both new and veteran counselors who recognized the rapidly changing nature of STEM; and (5) the trifurcation of science, mathematics, and technology departments and the lack of an engineering department in high schools made collaboration among faculty difficult and interdisciplinary rigor within engineering courses inconsistent across schools. Implications include the need for early and consistent precollege STEM counseling; accessible counselor professional development in STEM preparation and careers to promote multiple pathways and reduce counselor bias; and encouraging family involvement in STEM career decision making.

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Dissertation Advisor: Dr. Angela M. Kelly

Location: Virtual Conferencing – Please contact Judy Nimmo, Graduate Program Coordinator, for

Zoom access: judith.nimmo@stonybrook.edu.