E114 Addressing the Challenge of Conducting Undergraduate Research in Forensic Science Academic Programs Using a Course-Based Undergraduate Research Experience (CURE)

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Learning Overview: After attending this presentation, attendees will understand how to develop and execute a course-based method to integrate research into undergraduate forensic science academic programs.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by illustrating a modality for integrating research into an undergraduate forensic science academic program, as well as creating a potential pipeline for mutually beneficial collaborations between crime labs and forensic science academic programs.

There are inherent challenges when conducting any type of Science, Technology, Engineering, and Mathematics (STEM) research. Money, personnel, and time are just a few of the overarching issues that researchers face. Forensic science is both more interdisciplinary and applied than many other "traditional" STEM fields, so the task of implementing a robust research experience for undergraduate students to the field of forensic science research may face additional challenges. Traditionally, research at the university level has been the purview of graduate students and academic faculty; thus, research monies are awarded to these groups and research positions for undergraduates can be difficult to obtain. While many undergraduate STEM programs have encouraged participation in research, tenure track, or other research, faculty may not be performing research of interest to the undergraduate forensic science student. Thus, students typically participate in existing faculty members' research programs, which are often not specifically focused on the forensic sciences.

Both the 2004 Technical Working Group for Education and Training in Forensic Science (TWGED) report and the 2009 National Academy of Sciences Report made it clear to the forensic science community that research is essential for the support and advancement of the forensic sciences.[1,2] If crime laboratories are increasingly placing a premium on applicants who have research experience in addition to an appropriate science degree, then graduate students would be more sought after versus an applicant with "only" a four-year science degree. However, many students choose not to continue in a graduate program. This deficiency of participation in graduate programs coupled with the reality that there are not as many specific forensic science graduate programs as there are other traditional STEM graduate programs in the United States leads to a dearth of research-trained forensic scientists. This situation creates a demand that is difficult to meet and places students, educators, and crime laboratories in a bind.

Employing a CURE is a method for both new and established undergraduate forensic science programs to incorporate research into their undergraduate curriculum. By using a CURE modality, undergraduate students can participate in authentic research and carry that experience with them as a unique skill set that crime laboratories and other forensic-based employers are seeking.

The development of a core CURE curriculum designed to be used by multiple disciplines was created by an interdisciplinary collaboration at Arizona State University funded by the National Science Foundation. This model curriculum was applied to the forensic sciences by investigating the persistence of latent forensic evidence. The core curriculum included document templates and teaching module outlines for instructors and students to use throughout the course. These materials covered the importance of research; what "good" research looks like; experimental design, execution, and analysis; and presentation of research via different manners—scientific poster, oral presentation, and/or publishable research paper.

Research is no longer the province of just graduate programs and tenure-track academics. The CURE can serve as a single-semester research experience or a year-long capstone project. Whatever the format, the CURE model is an innovative and unique opportunity for undergraduate students to perform research at the university level, gain valuable experience while still an undergraduate student, and potentially collaborate with practicing forensic scientists on current research and/or validation projects.

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Reference(s)

1. U.S. Department of Justice, Office of Justice Programs, National Institute of Justice. Technical Working Group for Education and Training in Forensic Science (TWGED). *Education and Training in Forensic Science: A Guide for Forensic Science Laboratories, Educational Institutions, and Students*. Washington, DC, 2004. https://www.ncjrs.gov/pdffiles1/nij/203099.pdf.
2. Committee on Identifying the Needs of the Forensic Sciences Community, National Research Council. *Strengthening Forensic Science in the United States: A Path Forward*. Washington, DC, 2009. https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf.

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