D92 Teaching Forensic Science as a Science and as a Profession

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After attending this presentation, attendees will understand the problem of conveying to students the features of forensic science that distinguish forensic science from other scientific disciplines. Attendees will also understand how professional ethics and quality management concepts can be introduced to neophyte forensic scientists through lectures, readings, and writing assignments.

This presentation will impact the forensic science community by demonstrating how beginning forensic scientists come to understand forensic science as a historical science, to understand the importance of professional ethics, and to understand the vital role of laboratory quality management systems.

Graduate students entering master's degree programs in forensic science bring with them a number of misconceptions. Their understanding of forensic science has largely been informed by television programs such as *CSI* and *Bones*, in which crime scene investigators collect evidence, perform laboratory analyses, and interview and interrogate witnesses and suspects. Moreover, most undergraduate students in the natural sciences have been educated in experimental science, rather than historical science. In experimental science, researchers form hypotheses which predict the outcome of future experiments; in historical science, researchers look for traces of past events and try to reconstruct those events. Undergraduate science students (unless they have had occasion to work in an industrial laboratory) will not have had significant exposure to the concept of a laboratory quality management system (requiring, for example, standardized laboratory procedures which are ubiquitous in forensic science laboratories). Finally, entering graduate students will have little concept of professional ethics, in forensic science or in any other scientific discipline.

These lacunae in students' knowledge of forensic science are addressed in an introductory graduate seminar course required of all Master of Forensic Science students, regardless of their area of concentration. This course combines talks by departmental faculty and forensic science practitioners on a variety of topics, including scientific method, professional conduct, professional ethics, and quality assurance/quality control. These talks are supplemented by in-class discussions, readings, and writing exercises. For example, students read articles on the distinction between experimental and historical sciences and then write a "Logic of …" paper which follows the rubric developed by Doctors Richard Paul and Linda Elder for the Foundation for Critical Thinking. In this exercise, students answer the following questions about forensic science in general or a selected forensic science sub-discipline (e.g., forensic molecular biology, trace evidence analysis, or forensic toxicology):

What is the purpose of this field?
What question(s) does the field seek to answer?
What sort of information does the field use to answer questions?
What interpretations of data do practitioners in this field make? What inferences do they draw?
What concepts underlie this field?
What are the key assumptions underlying this field?
What are the societal implications and consequences of work in this field?
What is the intellectual point of view of practitioners of this field?

In-class discussions of professional ethics are supplemented by readings in a leading textbook on professional ethics in forensic science and by the codes of ethics of a number of forensic science professional organizations. Student writing assignments ask for responses to a variety of ethical dilemmas that might arise in the course of a forensic science career; students must cite the relevant professional codes of ethics in support of their resolutions of the ethical dilemmas. To drive home the need for quality management systems in forensic science laboratories (and also the need for codes of professional ethics), students read newspaper reports and other documents relating to the cases of Fred Zain and Annie Dookhan. The students complete a writing assignment in which they are required to analyze these cases and discuss the ways in which the laboratories' quality management systems were compromised. Students were then asked to suggest changes in laboratory policies that could prevent such episodes in the future.

Scientific Method, Ethics, Quality Management

 ** Presenting Author*