



E23 Observation, Explanation, and Testing in Forensic Science Using a Death Investigation Active Learning Assignment

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Learning Overview: After attending this presentation, attendees will understand some principles for instructing students in teaching scientific observation, explanation, and testing in an undergraduate education setting using forensic examples.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing an understanding on how framing the scientific method in the proper context can allow students to better understand how the forensic process is itself scientific, from the collection of the trace to the use of that trace in trial.

Traditional forensic science textbooks offer little guidance on how to approach teaching the salient features of the scientific method—observation, explanation, and testing—as an inherently *forensic* endeavor. However, without an appreciation of the scientific method, teaching forensic subdisciplines is more science appreciation than science application. Over four iterations of Purdue’s Entomology (ENTM) 22810: Forensic Investigation course, students were provided detailed scientific method active learning assignments, but failed to connect these assignments to the scientific method and forensic science subdisciplines. It was realized that this was the result of using non-forensic examples or forensic examples lacking a trackable process with a discernable beginning, middle, and end. To resolve these disconnects, an active learning assignment was created from a real *New York Times* article series of a 1922 double death investigation. The current assignment has been used in four iterations of ENTM 22810: Forensic Investigation.

This case study demonstrates the importance of observation, explanation, and testing in a forensic science context, and also allows students an approachable way to grasp the concepts of relevance and anomalous phenomena. Further, students are trained to differentiate facts, conjectures, and assumptions from each other. Students assess how these different elements impact the possible explanations for the deaths of Mr. and Mrs. Jackson as the case matures. This is accomplished because students organize the various explanations using a supported argument format. The assignment further provides students with an inquiry-based structure to objectively evaluate observation events not previously presented in the forensic context.

This case highlights the actions of the first forensic toxicologist in the United States, Alexander Gettler, while at the same time exploring the impact that historical events, such as prohibition, have on cases. Teaching methods are highlighted and physical examples of the *New York Times* articles and active learning assignments are presented for attendees to review. Students enrolled in this course completed surveys prior to this assignment to serve as a baseline measurement of knowledge regarding crucial concepts: anomalous phenomenon, relevance, observation, explanation, testing, and understanding the difference between facts, conjectures, and assumptions. At the end of the semester, after completing the active learning assignment, students are provided with a post-assignment survey. Student learning was assessed by comparing the students’ abilities to decipher these concepts from the beginning to the end of the semester.

Undergraduate Education, Scientific Methods, Case Analysis