



W08 Innovative Teaching With Active Learning Methods — Implementation in Forensic Science Education

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After attending this presentation, attendees will be able to: (1) describe general principles of learning, including examples related directly to scientific disciplines; (2) identify and describe a variety of active learning methods; (3) distinguish between active and non-active learning methods; (4) cite examples of useful teaching methods dependent on the environment; (5) evaluate innovative teaching styles that could be incorporated into their classroom; and, (6) generate lesson plans that could be integrated into their classroom.

This presentation will impact the forensic science community by exploring a variety of teaching strategies to gain insight into a broader scope of active learning methods useful in forensic science teaching. Attendees will learn how these teaching methods can help forensic science instructors adapt their lesson plans to rapidly changing learning environments. By discussing multiple learning techniques and the application of teaching methods in forensic science education, attendees will be able to incorporate new tools into their forensic science classroom.

Many instructors still teach the way they were taught — lecture and test — without realizing that more active learning methods exist. This session, organized jointly by the Council of Forensic Science Educators (COFSE) and the Forensic Science Education Programs Accreditation Commission (FEPAC), will explore innovative teaching strategies currently being used in science education. The active learning methods presented are applicable to undergraduate and graduate level forensic science programs, educational workshops for forensic science practitioners, and forensic laboratory trainees. Active learning methods improve a student's critical thinking skills, problem-solving abilities, and long-term retention of the material. Such methods include flipped classroom techniques, large lecture teaching methods, service-based learning, gamed-based learning, direct experimentation, and a writing-based approach to scientific learning. Each discussion will include real classroom examples of how the teaching method is implemented within the forensic curriculum and how to apply the teaching methods to any discipline.

This presentation explores what learning scientists have discovered regarding how individuals process new knowledge, reason with information, problem solve, and engage in professional practices. Theories about “what counts” as knowledge and learning will be explored, including individual cognition, sense-making, and apprenticeship.

A “flipped” classroom employs recorded lectures to deliver information outside of class time. Class time can then be used for other learning activities, such as case studies, discovery-based activities, writing-to-learn exercises, class discussions, and in-class office hours.

Teaching 15-30 students is much different from teaching 300-400 students. Instructors want to engage students in the material. This presentation will focus on methods used in large lectures to engage students through active learning techniques. Topics will include group discussion, useful technology to engage attendees in presentations, and response systems in the classroom.

This workshop will provide a framework for utilizing service-learning projects as an active learning methodology in the forensic science classroom. Service learning offers transformative learning experiences to students by developing “beyond-disciplinary skills,” broadening students' perspectives in relation to themselves and their community, integrating meaningful community service, and placing students at the “center of their own active and reflective learning experience.”

Forensic science education naturally lends itself to game-based learning. The games can be a re-imagination of a board game or be based on current technology. Additionally, hands-on laboratories and case studies allow instructors to incorporate vastly different game components. Assessment of student mastery of the material can be accomplished simply by the student successfully completing the game. The knowledge, skills, and abilities students gain from the game would complement any current curriculum.

Discussion will include the use of small-group activities interspersed within the standard lecture format. The different outcomes of providing groups with very detailed instructions regarding how to conduct an experiment compared to groups given simplified instructions will be discussed. Items to be covered will include creating groups, design strategies, and methods of evaluation.

Scientific writing is one of the necessities of the working life, yet teaching this subject to students proves to be a challenge. A journal-based approach yields higher grades and greater involvement for the students and leads to higher impact learning. Such an approach will be outlined, using a custom journal aimed at undergraduate level research, peer reviewed, and edited by undergraduates in an upper division science writing course.

Forensic Education, Active Learning, Teaching Strategies