

# THE EFFICACY OF DEMONSTRATION TECHNIQUES IN FORENSIC SCIENCE AND CRIMINOLOGY EDUCATION: A CONCEPTUAL ANALYSIS

<sup>1</sup> Tanya Filbert

<sup>1</sup> School of Social Work, Roshni Nilaya, Mangaluru, Karnataka.

---

## Abstract

*The fields of forensic science and criminology require a pedagogical approach that bridges the gap between complex theoretical frameworks and high-stakes practical application. Traditional lecture-based models often fall short in preparing students for the technical and procedural rigors of criminal investigations. This paper explores the "demonstration technique" as a critical instructional strategy. Grounded in Kolb's Experiential Learning Theory, the demonstration method encompassing both "lecture-demonstration" and "demonstration-performance" allows students to observe experts before engaging in supervised practice. In forensic science, this is vital for mastering psychomotor skills like latent fingerprint development and crime scene processing. In criminology, demonstrations through simulations and case-based role-plays facilitate a deeper understanding of social theories and investigative procedures. Research indicates that this method significantly enhances information retention, student motivation, and professional readiness. This paper concludes that integrating systematic demonstration techniques into curricula is essential for developing "field-ready" graduates capable of maintaining investigative integrity.*

**Keywords:** Forensic Science, Criminology, Demonstration Method, Experiential Learning, Pedagogy, Applied Learning.

## Introduction

Forensic science and criminology are multidisciplinary fields where the accuracy of physical evidence and the correct interpretation of human behaviour are paramount. Educational institutions are increasingly pressured to produce graduates who are not only knowledgeable in theory but also competent in practical application (Nilendu, 2024; Wickenheiser et al., 2023). The "demonstration method" has emerged as a hallmark of science teaching because it allows learners to observe complex processes while receiving auditory explanations, stimulating both critical thinking and creativity (Mutende et al., 2021; Oketunji et al., 2016). By moving away from one-way lectures toward hands-on, contextualized learning, educators can better prepare students for the complexities of modern crime scenes and the criminal justice system (Byrne, 2018; Chango et al., 2024).

### A. Theoretical Framework: Experiential Learning

The conceptual foundation for demonstration-based teaching is primarily rooted in Kolb's Experiential Learning Theory (Rogers, 2017). This theory posits that knowledge is created through a four-stage cycle:

**Concrete Experience:** Students observe a live demonstration, such as a mock crime scene or a lab procedure (Byrne, 2018; Rogers, 2017).

**Reflective Observation:** Students process the observed actions, explaining the concepts and theories associated with the specific circumstances (Byrne, 2018).

**Abstract Conceptualization:** Learners connect the observation to scientific or sociological principles, such as Locard's Exchange Principle (Byrne, 2018).

**Active Experimentation:** Students attempt the task themselves under supervision, transforming "showing and telling" into "doing" (Byrne, 2018; Oketunji et al., 2016).

### B. Application in Forensic Science

In forensic science, the demonstration technique is indispensable for teaching psychomotor skills and procedural accuracy. The "demonstration-performance" style is particularly effective, as students learn mental and physical skills by performing them under direct supervision (Oketunji et al., 2016).

**Crime Scene Investigation:** Demonstration allows instructors to model specific search patterns, such as the grid or spiral methods, illustrating how to avoid evidence contamination (Byrne, 2018). Mock crime scene practicums provide a "proof upon practice" environment where students pick up domain-specific information that cannot be captured in a traditional lecture (Byrne, 2018).

**Laboratory Procedures:** Complex tasks, such as fingerprint development with chemical reagents or DNA extraction, benefit from demonstrations that visualize the precise handling of equipment and biohazardous materials (Guerreiro & Sampaio, 2019; Santos & Amaral, 2020).

**Specialized Training:** Innovations in pedagogy include using demonstrations to "disentangle the complications" of specialized areas like bloodstain pattern analysis and digital forensics (Flores et al., 2021; Illes et al., 2016).

### C. Application in Criminology

While criminology is often perceived as more theoretical, the demonstration technique is applied through active and "transformative" teaching strategies (Nagy & Ibbott, 2024).

**Bridging Theory and Policy:** Demonstrations can take the form of simulated criminal policy debates or the use of popular culture to illustrate criminological theories (Mellgren & Ivert, 2016; Robinson, 2024).

**Applied Practice:** Instructors and community practitioners can team-teach, demonstrating real-world applications of behavioural profiling or interrogation techniques (Nagy & Ibbott, 2024).

**Active Inquiry:** Students may engage in "active learning" by interrogating evidence from past trials to establish wrongful convictions, a method that demonstrates the real-world consequences of procedural errors (Dealey, 2020).

### D. Effectiveness and Learning Outcomes

The integration of demonstration techniques yields several documented benefits for student learning:

**Enhanced Retention:** Physical skills and conceptual theories are better retained when they are practiced via activity and simulation rather than just read or heard (Byrne, 2018).

**Increased Engagement and Motivation:** Contextualizing learning within a "criminal investigation" framework arouses student curiosity and motivation to master scientific content (Guerreiro & Sampaio, 2019; Santos & Amaral, 2020).

**Workforce Preparedness:** Observational learning, such as visiting post-mortem examinations or participating in "forensic incubators," significantly improves employability and professional practice (Squires & Snelleksz, 2024; Wickenheiser et al., 2023).

**Critical Thinking:** By observing and then analyzing "authentic scenarios," students develop the ability to draw conclusions and make informed decisions based on evidence (Nilendu, 2024; Nodeland et al., 2020).

## Conclusion

The transition from passive lecture models to active, demonstration-based pedagogy is essential in forensic science and criminology education. By utilizing the demonstration method, educators can effectively bridge the gap between

theoretical principles and the technical skills required in the field (Byrne, 2018; Nilendu, 2024). As technology continues to evolve the nature of criminal investigations, the use of demonstrations, both physical and digital, will remain a cornerstone of effective, evidence-based forensic education (Chango et al., 2024; Nilendu, 2024).

## References

1. Byrne, D. (2018). Enhancing Information Retention of Forensic Science Students: Incorporating a Simulated Crime Scene Practicum in the College Classroom. *JOURNAL OF SOCIAL SCIENCE RESEARCH*, 13, 2843. <https://doi.org/10.24297/jssr.v13i0.8001>
2. Chango, X., Flor-Unda, O., Gil-Jiménez, P., & Gómez-Moreno, H. (2024). Technology in Forensic Sciences: Innovation and Precision. *Technologies*, 12(8), 120. <https://doi.org/10.3390/technologies12080120>
3. Dealey, J. (2020). Active learning in criminal justice. *Learning and Teaching*, 13(2), 85. <https://doi.org/10.3167/latiss.2020.130206>
4. Flores, R., Namin, A. S., Tavakoli, N., Siami-Namini, S., & Jones, K. S. (2021). Using experiential learning to teach and learn digital forensics: Educator and student perspectives. *Computers and Education Open*, 2, 100045. <https://doi.org/10.1016/j.caeo.2021.100045>
5. Guerreiro, I. L., & Sampaio, C. de G. (2019). Papiloscopia forense e revelação de impressões digitais na cena de um crime: uma ferramenta para o ensino de química com enfoque CTS. *Research Society and Development*, 8(9). <https://doi.org/10.33448/rsd-v8i9.1229>
6. Illes, M., Bruce, C., Stotesbury, T., & Hanley-Dafoe, R. (2016). Novel Technological Approaches for Pedagogy in Forensic Science: A Case Study in Bloodstain Pattern Analysis. *Forensic Science Policy & Management an International Journal*, 7, 87. <https://doi.org/10.1080/19409044.2016.1218573>
7. Mellgren, C., & Ivert, A. (2016). Criminal policy debate as an active learning strategy. *Cogent Education*, 3(1), 1184604. <https://doi.org/10.1080/2331186x.2016.1184604>
8. Mutende, R. A., Akala, W., & Imonje, R. (2021). Connecting Theory and Practice: Pre-service Science Teachers' Adoption and Implementation of the Demonstration Method. *International Journal of Learning Teaching and Educational Research*, 20(5), 189. <https://doi.org/10.26803/ijlter.20.5.11>
9. Nagy, V. M., & Ibbott, K. (2024). Team and Transformative Teaching in the Criminology Classroom. *Journal of Criminal Justice Education*, 1. <https://doi.org/10.1080/10511253.2024.2392662>
10. Nilendu, D. (2024). Enhancing forensic education: exploring the importance and implementation of evidence-based education system. *Egyptian Journal of Forensic Sciences*, 14(1). <https://doi.org/10.1186/s41935-023-00375-w>
11. Nodeland, B., Craig, J. M., & Meitl, M. B. (2020). Team-Based Learning in Criminal Justice: Application-Focused Activities in the Classroom. *Journal on Excellence in College Teaching*, 31(3), 135. <https://eric.ed.gov/?id=EJ1280465>
12. Oketunji, I., Oketunji, S. F., & Alarape, A. A. (2016). Leadership Competencies for Change Management in Libraries: Challenges and Opportunities. *Advances in Multidisciplinary & Scientific Research Journal Publication*, 2(4), 117. <https://doi.org/10.22624/aims/v2n4p12>
13. Robinson, C. (2024). Teaching criminological theory in higher education. *Learning and Teaching*, 17(2), 94. <https://doi.org/10.3167/latiss.2024.170206>
14. Rogers, D. (2017). Considerations in Using a Crime Scene House Facility for Teaching and Learning (p. 39). <https://doi.org/10.1002/9781118689196.ch3>
15. Santos, F. R. dos, & Amaral, C. L. C. (2020). A química forense como tema contextualizador no ensino de química. *Research Society and Development*, 9(3). <https://doi.org/10.33448/rsd-v9i3.2772>
16. Squires, K., & Snelleksz, F. (2024). A cut above the rest? The value of post-mortem examinations in undergraduate forensic science education. *Science & Justice*, 64(6), 637. <https://doi.org/10.1016/j.scijus.2024.09.009>
17. Wickenheiser, R., Cadau, A., Muro, C., Whitfield, S., McGinnis, C., Murray, L., France, M., Niles, L., Barron, D., & Valentin, L. (2023). The forensic educational outreach initiative – Bridging the gap between education and workplace. *Forensic Science International Synergy*, 8, 100448. <https://doi.org/10.1016/j.fsisyn.2023.100448>