

Thawing Cold Cases in the Classroom

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Abstract: This paper outlines the use of a current cold case to utilize foundational forensic science knowledge and connect theory to practice in an upper-division course. The cold case presented by a local law enforcement agency to two upper-division forensic science courses, with the students being responsible for compiling information, researching testing, and presenting the information back to the law enforcement agency. Students were provided with a voluntary online survey and a semi-structured interview with the detective sergeant of the local law enforcement agency. The student survey showed that the project was well-received, assisted in increasing knowledge in forensic science and cold cases significantly and to confirm future career paths. The interview explained the preparation needed to provide the cold case as well as the benefits obtained and the willingness to participate in future projects.

Keywords: Cold case, high-impact practice, forensic science, experiential learning

Introduction

The introduction of forensic science to the lives of many comes through popular dramatized prime-time television and idealized streaming service shows. Just as fictional television shows can influence jurors, students can enter college with an unrealistic expectation of forensic science and the criminal justice system [1]. Even shows that claim to be reality-based do not properly show criminal procedures and efforts used to solve cases, as there is difficulty in condensing a murder investigation to 44 minutes [2].

The CSI: Crime Scene Investigation television phenomenon, as well as other similar forensic-based shows, have encouraged more students to enter the fields of criminal justice and forensic science, though there is significant difficulty to explain the realities of the work versus what students have known from shows and movies [3]. Television show processes and procedures can be taken as gospel, forcing a myth versus reality unlearning of incorrect or stylized information. There is commonly a lack of realization of the heavy science coursework required to work in the field of forensic science, turning students away from the field and into allied areas [3]. Vicay and Zaikman's 2017 research showed that there was no correlation of forensic knowledge with watching crime-related television shows, possibly creating a false sense of knowledge when preparing for coursework or choosing careers [4].

Teaching forensic science to students in a social science major can be especially challenging, as many students have only taken the minimal science coursework required for an undergraduate degree. Building the foundation to explain the basic information behind

deoxyribonucleic acid (DNA) testing or blood spatter analysis can occupy nearly half of the semester. With this challenge, the incorporation of high-impact practices was introduced to an upper-division forensic science course within a social science major at a large, public university in California.

High-impact practices is a common buzz phrase in academia and are inclusive of first-year seminars, learning communities, common intellectual experiences, collaborative assignments, research, and writing-intensive courses [5]. Research shows high-impact practices are effective for student success, as there is a significant amount of time dedicated to a project with meaningful topics and the ability to apply gained knowledge [5,6]. When developing a project to bridge lecture-based learning to real life and incorporate basic science knowledge, the high-impact practice chosen for the forensic science course was a collaborative project. Just as investigative units work in teams, the students would be assigned to groups to tackle the project.

The focus then turned to building the actual project and requirements. With the author having experience working cold cases and the recent publicity with the arrest of the suspected Golden State Killer, a cold case project was chosen to fuse science with investigations using a real cold case as the carrier. Cold cases are cases that are inactive and unsolved [7], and many agencies do not have enough investigators to work older cases with the influx of active cases occurring daily. Cold cases hold a significant amount of importance, including justice for the victims and their families and the possibility of discovering other victims and stopping future crimes [8]. There was trepidation of the reception of this assignment by students,

as an active cold case had never been handled academically on campus.

Cold cases have been incorporated into coursework in the past, including graduate students in Washington, DC summarizing cold case files to triage cases for investigators [9]. Florida State University in Panama City's partnered with the Cold Case Investigative Research Institute to assist with cold cases, including requesting evidence processing and speaking with experts in the case [10]. While the specific work completed was not outlined, students provided support to investigators regarding cold cases.

The Course

The upper-division forensic science course is seated in the undergraduate criminal justice major. Students can take the forensic science course as an elective or as a requirement for an option in Justice & Enforcement. The course learning objectives are set by the department and include the evaluation of a crime scene, physical evidence, and laboratory results, understanding the function of a crime lab and the value of physical evidence, and the ability to draw inferences about physical evidence and determine alternative explanations for the evidence. The university does have natural science majors with a forensic science option, and the forensic science course serves as an elective for those students and anthropology students interested in forensic science. There are no pre- or co-requisites for the course. Two sections of the course were taught in Fall 2018, with 49 and 52 students respectively. The course was a 3-unit semester course taught in a hybrid setting with 2 hours of physical class time and 1 hour of instruction online per week.

The course had 15-weekly modules, with no work scheduled over Thanksgiving break. Journal articles were assigned weekly in place of having a textbook as an alternative learning solution. The course content included an introduction to forensic science, ethics and bias, science from the crime scene to the laboratory, an overview of evidence, reconstruction, death investigations, physical pattern evidence, fingerprint evidence, bloodstain pattern analysis, DNA evidence, toxicology, questioned documents, firearms and tool evidence, introduction to cold cases, interviews, case preparation, public speaking, and testimony in court.

Six quizzes were present in the course based on reading, with both in-class and online quizzes assigned. Weekly discussion boards had the requirement for a primary post and one response to a classmate regarding a case or topic relating to the material presented that week. A midterm was in the ninth week of the course and there were four laboratory exercises. The laboratory exercises occurred in a group with individualized evidence and reports required of each student. The laboratory exercises included physical evidence comparison, fingerprint

evidence, ballistic evidence, and a "build your own lab" where students outlined a laboratory exercise from a topic we discussed in the course.

The final group project held the most weight of all assignments in the class at 30% of the final grade. The students were randomly placed into groups of 6-8 people using the learning management system, and the groups were formed immediately after the add/drop period. The final project required the students to write a 6-8-page paper outlining the cold case, the evidence from the scene, recommendations for testing of the evidence, and follow-up that should occur. The students were also responsible for giving a press conference-type presentation lasting 6-8 minutes in length explaining the evidence found during the investigation and their recommendations for testing and investigative follow-up. The press conferences occurred in front of their classmates and a sergeant and lieutenant from the cold case law enforcement agency. The requirements were thoroughly reviewed during class and were present in the learning management system. There were two class days reserved solely for in-class work on the final group project, and two class days were spent on the presentations.

The Case

Local law enforcement agencies were contacted to determine interest levels of sharing a cold case with the forensic science classes. Nearly all agencies contacted expressed interest, though the request for a classroom presentation and introduction on the case and participation in the press conference presentations limited participation due to staffing. The redaction process for some agencies would take longer than the project length, and one agency did not have personnel available to review and choose a cold case. Ultimately, one agency was able to provide a 30+-year-old cold case homicide including the entire case file, redacted for confidentiality. The nearly 200-page report included the law enforcement reports, investigative reports, prior arrest history, interviews, evidence collected with a scene sketch, and an autopsy report. The detective sergeant introduced the case to both classes and explained that all case content was made available for review by the students. The detective sergeant outlined the location of the crime at the time of the murder, as well as investigatory challenges when working cold cases. The students were provided with the report days in advance of the detective sergeant's presentation, to allow for specific questions about the case to be addressed. Since the local law enforcement agency was spending a significant amount of time and effort on providing this cold case, I volunteered to compile all information presented by the students for recommendations on the case and prepare the information into a report.

Project Preparation

The students were able to work on the cold case project for 5-6 weeks before the presentations. The groups generally worked well together, and there were thoughtful discussions about the case in class. Some students struggled with the idea that there were no video cameras available for viewing or cell phone towers to show the possible locations of involved parties. Others expressed extreme frustration with the inability to read all of the handwritten reports. The lack of viewability became a learning tool for understanding the difficulties of cold cases, as well as utilizing methods for reading difficult handwriting and non-technology based investigative methods. Some students searched through microfiche to try to locate news articles, traveled to the county courthouse to try to locate information, and others returned to the scene of the crime for photographs and an attempt to determine a scenario from the diagrams present in the report. For the press conferences, multiple groups prepared a slide show, which aided in describing the location of the evidence and so their crime scene scenario was easily tracked.

After the initial case presentation to the students, the author spent over 30 hours outside of class in the latter portion of the semester assisting students to gain an understanding of the difficult components of the report. The realities of cold cases, with missing pages, unreadable areas, and incomplete reports was made clear to students at the end of this project, with many comments during class made about how easy it looks on television. The author mitigated group member absence and lack of participation in three groups, though a vast majority of the students remained motivated to work on the project and potentially determine who the suspect(s) may be.

Student Cold Case Investigation Recommendations

Students presented their recommendations in both the press conference format and in their final papers. The suggestions for evidence testing were appropriate for the items to be tested, including the use of cyanoacrylate fuming, DNA testing with entry into the Combined DNA Index System, stab wound analysis, testing of autopsy-retrieved specimens, blood spatter analysis, decedent tattoo analysis to determine the artist or possible affiliations, and a complete recreation of the scene for further analysis. Students also suggested which witnesses, as listed by date and time of contact, should be re-contacted based on the likelihood that they may have additional information. At the end of the presentations, a possible investigative scenario was provided to the students by the detective sergeant. The student recommendations were placed into a report and provided to the local law enforcement agency, who was planning to follow-up on evidence processing and witness contacts.

Methods

A mixed-methods approach was utilized to determine the effectiveness of the cold case project as a tool to increase understanding of forensic science. An institutional review board approved a confidential online survey that was provided to students for voluntary completion, and a semi-structured interview was conducted with the detective sergeant from the local law enforcement agency. The semi-structured interview questions are present in Appendix A. The survey instrument included demographic information, questions with a Likert scale, multiple-choice questions, and short answer questions. The survey contained 22 questions, inclusive of five demographic questions, with questions available in Appendix B. The research instrument for the semi-structured interview included seven open-ended questions.

Results

The student survey received 44 complete responses from both sections of the course, with a combined student total of 101. The result was a 43.6% response rate, with most respondents being female (77.3%), 21-23 years old (50%), criminal justice majors (75%), taking the course as required for their major (88.6%), and working part-time, less than 40-hours per week (52.3%). The students were asked about their enthusiasm level about the cold case with levels of dread to very enthusiastic, and 43% of the respondents noted that they were very enthusiastic about the project. Only one respondent had worked on a cold case before this class, which was through an internship or employment. When asked about their level of understanding of forensic science and cold cases at the start and end of the semester, students rated their knowledge from very basic (heard terms in the news) to advanced knowledge (significant coursework, research, or experience). With regard to forensic science knowledge at the start of the semester, 77% of respondents listed their knowledge as advanced basic to moderate. At the end of the semester, 89% of respondents listed their knowledge as high moderate to advanced. For cold case knowledge at the beginning of the semester, 61% of the respondents noted their knowledge to be very basic to basic. At the end of the semester, 93% of respondents ranked their knowledge at high moderate to advanced. At the end of the semester, no respondent ranked their knowledge on either topic as below moderate. All respondents noted that the foundational material in the course was used to assist with the cold case, with 9% of respondents listing that the foundational knowledge was used in a limited manner. For the introduction of the case by the detective sergeant, 89% of the respondents found this to be helpful or somewhat helpful. All respondents felt the cold case project assisted in understanding the challenges of cold cases. Forty of the

respondents, or 91%, noted that the cold case project assisted them in confirming their career goals.

In the optional short answer portions of the survey, respondents commented about their enthusiasm for the project ranged from being excited about the opportunity to learn from a real cold case and applying their critical thinking skills and gain hands-on experience. One respondent mentioned growing up watching documentaries on cold cases and finally having the opportunity to work on a cold case. Others noted that they do not enjoy working on group projects and not knowing what to expect. When asked about how the cold case assisted in the understanding of topics, students noted that the case was a real-world adaption of knowledge gained in class, how information from other groups brought different perspectives, how much the student did not know and wants to learn. The final question was to provide additional information they would like to share and comments included that the homicide case was not interesting, and others confirmed their positive experience and stated the request for cold cases in future courses.

In a semi-structured interview with the detective sergeant, the sergeant stated that his agency had never participated in a project like this before. The local law enforcement agency does not have an investigator assigned to cold cases, and the major crimes detectives work on cold cases as time allows. The case was chosen as information had been recently received so the detective sergeant was able to become familiar with the case. It took approximately 5 hours to prepare the cold case and redact the confidential information. The perceived risks noted by the detective sergeant is that a student may be a relative to the victim, witness, or suspect. If a student is related to the victim, new information may come to light, though if the relation was to a witness or suspect the case might become compromised. The detective sergeant found the information and recommendations to be helpful in investigating the case, including new and innovative techniques that can be used in this case and other cases. The detective sergeant is willing to participate in future cold case projects.

Discussion and Conclusion

With the addition of the cold case project, the course was found to be a success in terms of student feedback on knowledge gained in both forensic science and cold cases. A local law enforcement agency was able to obtain information on forensic testing, interviewing, and other techniques that can assist in the cold case investigation and future investigations. Students were able to gain experience working in groups as well as presenting findings and recommendations. With this project, students will be able to connect course knowledge to real-world situations and improve their critical thinking skills, which is vital for their future careers.

In future sections of this course, the author will request that the course be fully lecture-based to allow 3 hours of

instruction in class during the week. The additional time will allow for the presentation of more lecture content, allow for more questions to be asked in class, and to have added time to work on the cold case project. The structure worked well with starting the cold cases after the midterm and having a presentation by the agency. Future courses will include multiple cold cases, up to 4, of varying types including John and Jane Does and missing persons. With the addition of different case types, databases including NamUS, can be introduced and searched. The groups will be limited to four persons, as larger groups can get lost in the distribution of work instead of the work itself. The press conference presentations will continue to be open to the participating law enforcement agencies and the author will compile full reports with the recommendations of the students. Reaching out to law enforcement agencies well in advance of the course starting may assist with the time needed to obtain clearance to share the case or redact the information. With proper preparation and time available to assist students during the semester, the cold case project can be an appealing addition to any forensic-based course.

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- b. 21-23
 - c. 24-28
 - d. 29-35
 - e. 35+
 - f. Prefer not to state
- 3.) What is your gender?
 - a. Female
 - b. Male
 - c. Other
 - d. Prefer not to state
 - 4.) What is your work status?
 - a. I do not work / Full-time student
 - b. I work part-time (up to 30 hours per week)
 - c. I work full time (30-40 hours per week)
 - d. I work over 40 hours per week
 - 5.) What is your major?
 - a. Criminal Justice
 - b. Chemistry
 - c. Biology
 - d. Anthropology
 - e. Other
 - 6.) Why did you take this course?
 - a. Required for my major
 - b. Required for my minor
 - c. Not a required course, but I have interest in pursuing a career in forensic science
 - d. Not a required course, but I have personal interest in forensic science
 - e. Other
 - 7.) What was your knowledge of forensic science at the start of the semester?
Likert-style scale from: Very basic knowledge (understanding of the topic and some types of evidence) rated as 1 to Advanced knowledge (significant coursework, research or work experience in forensic science) rated as 5
 - 8.) What was your knowledge of cold cases at the start of this semester?
Likert-style scale from: Very basic knowledge (heard the term in the news) rated as 1 to Advanced knowledge (significant coursework, research or experience in cold cases) rated as 5
 - 9.) When you were notified of the cold case project, were you enthusiastic about the project?
Likert-style scale from: Dreading the project rated at 1 to Very enthusiastic about the project rated at 5

Appendix A

Semi-structured interview with a detective sergeant

- 1.) Have you or your agency participated in a collaborative cold case effort with an educational institution?
- 2.) How was the cold case chosen?
- 3.) Do you have a dedicated unit or personnel assigned to cold cases?
- 4.) How much time (estimate) did you spend preparing the cold case for review by students?
- 5.) What were the perceived risks and benefits of presenting a cold case to a local university/educational institution?
- 6.) Was the presentation of information and copy of recommendations from the student papers helpful in investigating the cold case? If so, how?
- 7.) Would you be willing to participate in a cold case exercise like this in the future?

Appendix B

Student Survey Questions

- 1.) Which section of CRJ 380 are you enrolled in?
 - a. Section 1
 - b. Section 2
- 2.) What is your age?
 - a. 18-20

- 10.) Why were you list your enthusiasm for the project as you did?
Short answer
- 11.) Have you worked on a cold case before?
- Yes – in the course of my employment or internship
 - Yes – in another course
 - No
 - Maybe
- 12.) Did you use the materials gained in the first portion of the course to work on the cold case project?
- Yes
 - No
 - Limited
- 13.) Did the cold case project show you the difficulties of working on cold cases?
- Yes
 - No
 - Maybe
- 14.) Do you feel the cold case helped you to understand topics in forensic science better with the real world application?
Likert-style scale from: The cold case did not help me understand forensic science topics better rated as 1 to *The cold case increased my knowledge of forensic science topics* rated as 5
- 15.) Why did you answer how the cold case assisted in understanding of topics?
Short answer
- 16.) Was the presentation of the cold case by the detective sergeant and the availability of the entire file helpful in understanding the occurrences of the case?
- Yes
 - No
 - Maybe
- 17.) Which assignment in class assisted the most in your understanding of forensic science?
- Laboratory assignments
 - Assigned reading
 - Discussion boards
 - Cold case project
 - Quizzes
 - Midterm
- 18.) At the end of the semester, how would you rate your knowledge of forensic science?
Likert-style scale from: Very basic knowledge (understanding of the topic and some types of evidence) rated as 1
- to *Advanced knowledge (significant coursework, research or work experience in forensic science)* rated as 5
- 19.) At the end of the semester, how would you rate your knowledge of cold cases?
Likert-style scale from: Very basic (heard the term in the news) rated at 1 to *Advanced knowledge (significant coursework, research or experience in cold cases)* rated at 5
- 20.) Do you believe the cold case project will assist you in your future career?
Likert-style scale from: The cold case project experience will not help at all rated at 1 to *The cold case project experience will help immensely* rated at 5
- 21.) Did the cold case assignment assist in confirming your career goals?
- Yes
 - No
 - Maybe
 - I don't know
- 22.) Please provide any additional information you wish to share about the cold case project.