

The application (it should be no longer than 2,000 words)

Title: Embedding a work-based learning approach to enhance engagement, academic attainment, inclusivity and employability in Forensic Investigation

The following case study will support my claim that the effective use of work-based learning can have an outstanding impact on student learning through the redesign of the module in line with the Learning and Teaching Strategy, student feedback and scholarship of learning and teaching. This case study highlights the positive impact of WBL on student engagement, academic attainment, employability skills and inclusivity.

Context

In a SSLC meeting in 2018 Level 5 students provided feedback on the Reconstructing Crime Events (RCE) module, stating that they had enjoyed the module and hearing about the different disciplines presented during the lectures. The word that resonated with me was 'hearing'. This word made me question how much the students learned versus what they found interesting. At the time the module was largely teacher-centred, with weekly 4-hour sessions, comprising of an academic delivering a lecture on the theory of a specialist discipline within forensic investigation and how it is used in the reconstruction of crime.

I later became the module leader for RCE, I decided that I was going use this opportunity to redesign the module and incorporate the student feedback.

The module is optional for single and combined honour students. My motivations for redesigning the module are listed below all of which align with the University's Learning and Teaching Strategy:

1. **Module attainment:** The average module mark for 2017-18 was 46.8%. In redesigning the module, I wanted to transform the way the learning outcomes were achieved and the student learning experience. I decided to use Brigg's constructive alignment approach (Briggs, 1996, 1999)-Appendix 1. This provided me with an opportunity to transform the curriculum to better deliver the learning outcomes and encourage deep learning. This would help to support the students towards success and allow them to take responsibility for their learning.
2. **The student voice:** I was keen to incorporate the previous cohort's feedback and work as co-producers of knowledge
3. **Enhancement of employability skills:** I wanted to embed the graduate attributes outlined in the QAA standards for forensic science related subjects, stating that HE institutions should adhere to the same standards imposed on forensic science practitioners and degree programmes should develop investigative, analytical, critical thinking and laboratory graduate attribute skills (QAA, 2012). But I wanted to take this further and educate the whole person by developing graduates that are autonomous, empowered, confident and impartial not only in their approach to casework but also to life and learning.

4. **Inclusive learning environment:** many of the students suffered from anxiety and mental health, one student is diagnosed with a severe speech impairment, the module consisted of 13 BAME students and to build better relationships between single honours and combined honours students.
5. **Enhance student engagement:** I wanted to work with the students as partners in learning/co-creators. This is particularly important in a programme like forensic investigation as TV programmes often portray a 'sexified' version of forensic investigations and are far-cry from the reality of quality standards, anti-contamination, data interpretation and horrific smells. When faced with this reality students can be at risk of disengaging and losing their passion, a big problem for the HE sector. As an academic I feel the pressure to make lectures engaging in a bid to maintain student numbers, improve attainment but more importantly to nurture each student's passion for forensic science, an industry that I am very fond of.
6. **Technology Enhanced learning:** Enhance digital literacy skills though VLE, BB discussion board to promote flexible, inclusive, responsive and collaborative learning, simulate professional practice and dissemination of information

Approach

Given the investigative and multi-disciplinary nature of forensic investigations I decided to use a combination of problem-based and work-based learning approach. PBL is student-centred and would provide the mechanism in which students would be able to apply, relate and theorise acquired knowledge to forensic casework. The nature of PBL allowed for a flexible and responsive learning environment to accommodate my diverse cohort of students. WBL approach would help provide the students with real-life experience and develop employability skills.

In collaboration with Kent Police I developed a case study (Operation Cayman) based on cases that I previously encountered in industry. This helped to ensure that the problems/activities used were authentic and relevant to real-life. The case study was carefully selected so that I could embed key employability skills such as evidence collection recording, integrity, development of experimental procedures and interpretation of data. I was also aware that many of my students wanted to be CSIs so this provided them with an opportunity to work closely with experts, gain commercial awareness and ask questions that they may never get the opportunity to ask in the traditional classroom environment.

At the start of the module students were introduced to Operation Cayman, sub-divided in to groups (Figure 1) and instructed that as a cohort they would work collectively to reconstruct the events that occurred before, during and after the crime had taken place, assigned a forensic discipline and the cohort was given a maximum hypothetical budget of £15,000 to complete their investigation. The format was designed so that students were gradually receiving information throughout the semester and would need to develop and execute a forensic strategy. The module was structured by utilising a series of problems with one over-arching goal, to determine the events that had taken place. This allowed the students to work on small-scale interconnected problems in their group whilst

working as collaborators of a larger case study. This was to help build a learning community and foster better relationships between the students. To ensure that Operation Cayman was student-led, the students nominated two students that would assume the role of the Senior Investigating Officer and the Deputy Investigating Officer. Myself and Kent Police acted as the facilitators to help ensure that students remained on track.

BB discussion board was used as tool to help support students suffering from social anxiety and speech impairment as it was important that these students had a voice within Operation Cayman and the wider classroom environment. Using the discussion board all students were able to request forensic submissions, scientific reports, disseminate information, pursue lines of enquiry, communicate with peers and lecturer.

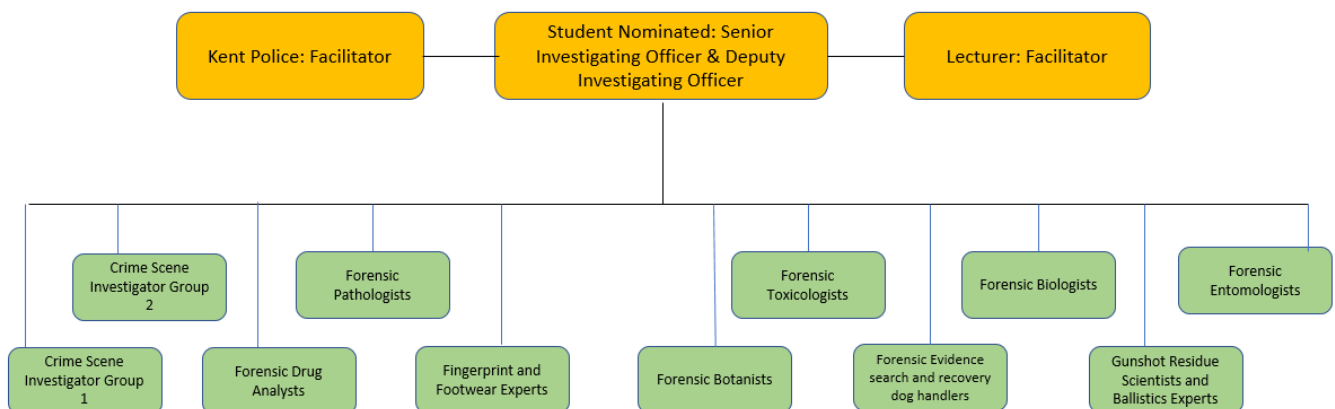


Figure 1: Roles occupied by students within the Operation Cayman Exercise

The case study began by setting the scene, students were informed that over 11 weeks they had to investigate the circumstances resulting in the death of Lucas McGregor. To initiate the investigation students attended a mocked-up crime scene containing the body of the deceased and other forensic evidence as Crime Scene Investigators. During one of the activities students were taken to Kent Police College and the students observed an enactment and the arrest of a suspect relating to Operation Cayman, participated in a moot crime scene search with the search and evidence recovery dogs unit whilst incorporating a range of forensic disciplines. The students had to promptly devise a plan on how they were going to sample the suspect, what evidence they needed to secure and how. It was great to see how quickly the students took on their roles, supported each other during the scene and scaffold on knowledge they had acquired throughout the module.

How did I evaluate the impact?

1. **Assessment outcomes:** two assessments (Exam and presentation). **The presentation was peer-reviewed** (10% assessment mark awarded by peers, 90% awarded by 2x academics). I opted for peer-reviewed presentations as assessments have the power to drive learning thus, students should have a clear understanding of how they are measured (Kearney, 2013; Stanier, 1997) and we continued as partners.
2. **Module evaluation form:** The student voice

Measuring impact

1. Academic Attainment

There was a noticeable increase in the attainment on this module from the previous year (Table 1).

Table 1: Outlines of the average mark obtained for each assessment on the Reconstructing Crime Events module and the overall average module mark for years 2017-18 and 2018-19.

	Average mark obtained in 2018 (%)	Average mark obtained in 2019 (%)
Presentation	57	69.5
Examination	37.6	48.2
Overall module mark	46.8	58.5

The increase in academic attainment demonstrates that the combination of PBL and close partnerships with industry had a positive impact on student engagement and attainment.

In previous years students were required to deliver a presentation on a case of their choosing (usually a high-profile case that they had found on the internet) the average module mark was 57% and 7 students failed to meet the minimum pass mark of 40%. Now the presentation was based on their work within the Operation Cayman case study. In this way students were able to explain, relate, apply and theorise demonstrating a deeper understanding of the subject (Biggs 1996; Biggs 1999).

2. The student voice: module evaluation form

All students strongly agreed/agreed that the use of Operation Cayman and the collaboration with Kent Police helped to develop their understanding of the multi-disciplinary and inter-disciplinary approach to crime reconstruction and had felt that they had been challenged throughout the module to produce their best work. Students reported that the incorporation of group-based activities helped them to get to know their peers. Appendix 2 provides feedback from the students.

3. Enhancement of employability skills:

Working with Kent Police helped the students to see the relevance to the work they will be undertaking in the real world. The students strongly agreed/ agreed that the activities carried out with the Kent Police was appropriate for the module and supported their learning.

The collaboration helped ensure that the curriculum content was relevant and reflects the professional standards. Appendix 3 provides feedback from Kent Police.

4. Developing inclusive learning environments:

- **Peer-review:** Some students expressed concerns relating to the possibility of bias and assessment inexperience. These concerns were addressed collectively as a group (staff and students) and analogies were drawn between integrity and impartiality of an assessor and those operating within the CJS. Students were able to see how peer-assessments helps to develop values related to their desired profession and embraced the process. On completion of the presentations students expressed that they had found the process informative, developed their understanding of the marking criteria and picked up presentation skills from their peers.

- **Impact on BAME attainment**

	Average mark obtained in 2018 (%)	Average mark obtained in 2019 (%)
White Students	52	61
BAME Students	34	50

I noticed that my BAME students and white students integrated more, developed friendships with students that they had not spoken to before. Students stated that the case study had helped them to develop better relationships with their peers, building learning communities. Although there is still a gap between white students and BAME student the gap dropped and the average attainment for BAME students increased significantly.

5. Enhance student engagement:

Students were more motivated and engaged with learning and became more confident. On completion there was an increase in peer interaction, students became compassionate towards each other and demonstrated a greater awareness of other learner's needs. For instance, during the presentation assessment one student became noticeable anxious. During this time other students observing the presentation provided words of encouragement to help build the student's confidence. This was great to witness.

6. Technology Enhanced learning:

Using the VLE and BB discussion board provided a safe space for students with speech difficulties and anxiety to communicate with peers and to feel included in learning environment. One of the students stated: *'I want to thank you for helping me overcome my anxiety about my course, I would not have done it without talking to you, I would probably quit uni otherwise'*.

Conclusion

Overall, this case study demonstrates that the combination of WBL and PBL enhanced the student experience and allowed them to take ownership of their learning, support the learning of others and were better able to identify when they needed to acquire knowledge to solve the problem, helping to develop lifelong learners. The partnership with Kent Police provided the opportunity to develop crucial employability skills. Appendix 3 includes feedback from other similar collaborations.

Dissemination:

- The work will be presented at the Advance HE Teaching and Learning Conference 2020
 - The case study has been delivered as part of the University's IAP module on the PGCAP programme
 - In January 2020 I was invited by Loughborough University to present the work outlined to staff. Staff are incorporating this format into physics modules
- PRISM- to be uploaded