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Google Earth as a resource for remote teaching: an application to crime scene investigation

Katie Davidson
University of Strathclyde, Glasgow

Keywords: Google Earth; remote teaching; technology enhanced learning; Covid-19.

The challenge

Covid-19 has posed a number of challenges for higher education institutions at all levels, especially for programmes that are heavily focused on practical work. I am part of a team that teaches a forensic science course which has many major practical elements that are essential to the students' skill development and understanding. The last 18 months have really encouraged thinking outside the box in terms of how to transition this practical face to face teaching into remote learning, whilst still meeting the course requirements and meeting the learning objectives set.

This unique situation has provided a platform to experiment and explore learning development and pedagogical practice. A key area within forensic science is crime scene investigation and management, and one of our flagship activities on the course is a mock outdoor crime scene. Under normal circumstances, the students would attend multiple laboratory sessions and face-to-face tutorials to learn and develop key examination techniques and gain a clear understanding of how to approach different types of crime scene. In line with the university Covid-19 restrictions, it was established that the preparation for the crime scene exercise would now consist of recorded lecture content and a live online workshop to ensure student engagement and consolidation of information. Therefore, the challenge presented was being able to adapt and develop content for effective remote delivery that also aligned with the learning objectives, provided students with an engaging learning experience, and gave them an opportunity to demonstrate key professional skills.

This motivated me to develop an innovative way of teaching so that I could effectively adapt the content to align with remote learning, and still provide the students with the required learning experience in an online workshop setting. I began researching online resources to see what was readily available that I could implement in my teaching and discovered a number of programmes and software designed to engage students, most of which came with a fee attached. It also became clear that there was a lack of research on and application of technology and software in a remote forensic education setting, specifically for crime scene investigation. My goal was to design an activity that students could not only engage with in real time, but also have as a learning resource in future. I discovered an article by Thompson (2020), who used free, open access software called Twine to adapt the traditional lecture model into an interactive learning experience with a non-linear narrative. I was impressed by the clear focus on student decision making and the level of engagement created, both of which were key aims for my content. This, combined with inspiration from a virtual blood pattern analysis experience developed using immersive 360° panoramic film (Nichols-Drew, 2018), influenced the discovery and application of Google Earth to create a virtual crime scene scenario as a remote teaching resource.

The response

My department was fortunate enough to obtain a university licence for a newly developed app called "Crime Scene Assistant", which has been created by forensic practitioners to provide forensic awareness to first responders at a crime scene, such as paramedics and police officers (https://crimesceneassist.com/). The app offers advice on best practice and guidance for scene preservation, recovery and documentation, and provides useful checklists for key decisions made at the scene. Our forensic students were given access to the app for a year as a learning and revision tool that can be used from their mobile phones at home and on campus. Therefore, I decided to develop an interactive resource, incorporating use of the app, that would support the theoretical crime scene content and create an engaging experience in which the students could demonstrate problem-solving skills and critical thinking in evaluating a scenario and making informed evidence-based decisions.

At this stage I discovered Google Earth Projects, a free, remotely accessible resource which is designed to create presentations that include markers, information slides and images, primarily for giving travel tips and advice. Google Earth Projects allows the creation of customised maps with a narrative that can include photos, videos and external resources, allowing you to develop a tailored, interactive experience. I then transferred my crime scene scenario into this format to create a virtual crime scene, resulting in increased interactive content that students could engage with. Screenshots from the project can be seen in Figure 1 below, demonstrating the application of presentation slides, customised map creation, and images and information boxes to deliver the content. This format also provided me with the opportunity to tailor the content to suit different levels of students, both undergraduate and master's, to meet the required learning objectives.
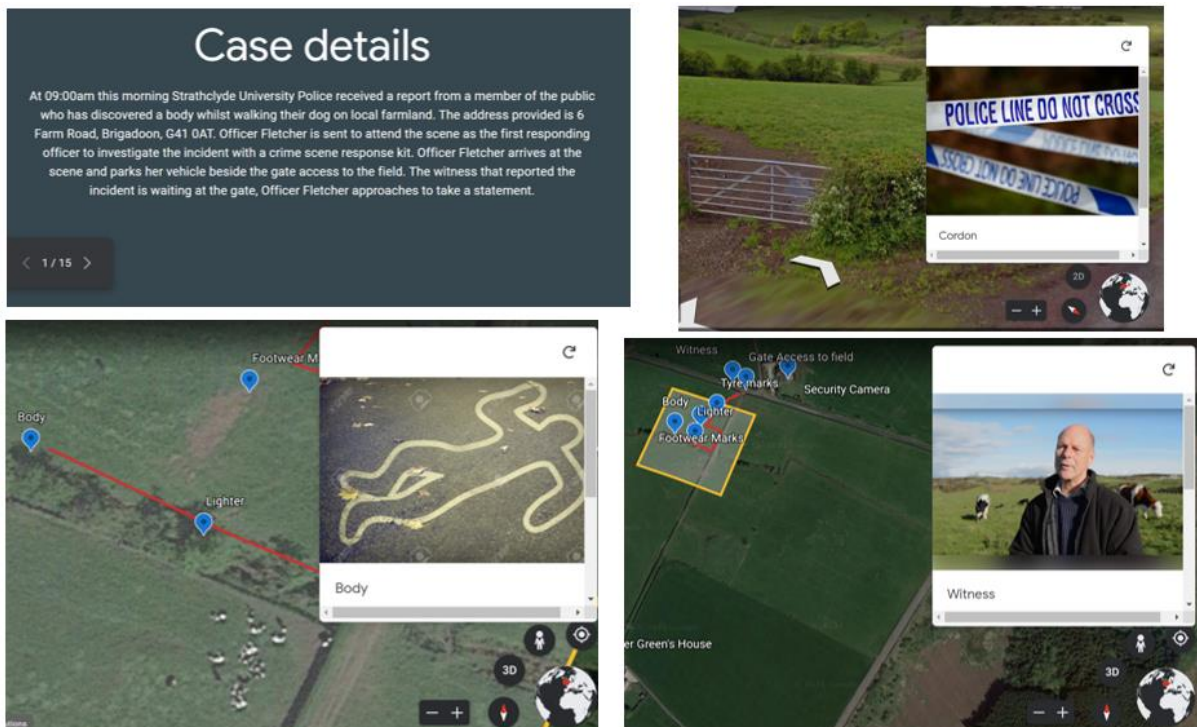

Figure 1. Screenshots of the Google Earth Project virtual crime scene workshop.

My Google Earth virtual crime scene consisted of an investigative narrative of how a crime scene investigator approached and managed a crime scene, which the students could follow and then evaluate using the guidance and advice from the Crime Scene Assistant App. This activity involved a combination of observation and case- and problem-based learning pedagogy through group work and discussions, which allowed the students to

develop their problem solving and critical thinking skills, collaboration and communication skills, and observational skills (Shukla, 2021). This was delivered to both undergraduate and postgraduate students, with class sizes of 25 and 58 respectively. Students were then put into groups of between five and seven to complete the activities during the workshop. The workshop was a success, and the students were very engaged with the content and delivered effective group discussions and feedback on the scenario. They enjoyed the opportunity to learn in a different way and stated that it was a great supporting activity and tool that assisted in developing their learning and understanding of future practical elements of the course. It also provided an opportunity to engage with their classmates and to develop their team working and presentation skills, which are key elements of the course. This group work allowed students to collaborate and discuss their thoughts and opinions, therefore applying their critical thinking and problem-solving skills.

Recommendations

While this workshop was developed for remote teaching, I believe it is an effective resource for both remote and in classroom delivery and has the potential to be used in a number of different formats and tailored to different levels of education. Whilst the class sizes I delivered the workshop to were reasonably small, this could be scaled up for larger classes and be delivered in multiple sessions. However, I feel that the smaller working groups were more beneficial for student participation and engagement. Feedback obtained highlighted that the students enjoyed the opportunity for group discussions and also the case scenario format, which allowed them to evaluate information and ask questions. Therefore, Google Earth could be utilised to facilitate practical learning opportunities and learning development in a number of thematic areas, supporting key student skills such as problem solving, critical thinking, collaboration and communication. There is scope for this approach to be used to support forms of assessment in future, as it encompasses the understanding and application of knowledge as well as problem solving and critical thinking skills, providing a move away from more traditional examination. I feel incorporating technology and variety in assessment is key to learning development and creates a more inclusive learning experience.

This concept could be developed further with the inclusion of more interactive content, for example external links to information and data that could be applied to the scenario or introducing the concept of virtual reality as effectively demonstrated by Mayne and Green (2020). Using this kind of platform, in combination with other available technology and software, maximises opportunities for engagement both in and out of the classroom environment. This mode of teaching practice has a positive impact on student learning and understanding, as it incorporates the continuous development of learning technology and targets key professional skills that students need to be exposed to. As stated above, there is also the capacity to incorporate this teaching practice into assessment and feedback modules, which creates an innovative way of assessing student understanding. This new approach to teaching and learning has motivated me to review other areas of my teaching to see how similar practice can be applied to develop more inclusive and flexible learning experiences.

References

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Author details

Katie Davidson is a Teaching Assistant on the MSc Forensic Science course within the Department of Pure and Applied Chemistry at the University of Strathclyde in Glasgow. Drawing on her previous experience as a forensic examiner, her areas of teaching include crime scene investigation and management, blood pattern analysis, and trace evidence examination. Her research interests include technology enhanced learning and student engagement in higher education, with a keen focus on developing and creating innovative teaching practice to enhance student experience.