



Vol.2 No.2 (2019)

Journal of Applied Learning & Teaching

ISSN : 2591-801X

Content Available at : <http://journals.sfu.ca/jalt/index.php/jalt/index>

Forensic science and student mobility programs in the Indo-Pacific region: Unveiling the potential of an international and intercultural project in forensic science education

Paola A. Magni^A

A* *Senior Lecturer in Forensic Science, Murdoch University Perth; Deputy Dean, Murdoch University, Singapore*

Jolene M. Anthony^B

B *Bachelor of Science (Honours) in Forensic Biology and Toxicology, Murdoch University, Australia*

Raja M. Zuha^C

C *Senior Lecturer, Forensic Science Programme, Faculty of Health Science, Universiti Kebangsaan Malaysia*

* Corresponding author: p.magni@murdoch.edu.au

Keywords

Education;
forensic science;
intercultural experience;
internationalisation.

Article Info

Received 31 October 2019

Received in revised form 17 December 2019

Accepted 24 December 2019

Available online 31 December 2019

DOI: <https://doi.org/10.37074/jalt.2019.2.2.5>

Abstract

Forensic science is the application of science in a criminal investigation or court of law. Crimes and forensic investigation have always been associated with human society. As an interdisciplinary field, forensic science incorporates areas of both life sciences and social sciences. Until the beginning of the 1900s, forensic science was self-taught and carried out exclusively through law enforcement agencies. In recent years, with the success of crime drama television series, an increased global interest in forensic science-based university courses has been observed. The prevalence of global issues such as international crimes and mass disasters has catalysed the need for international collaboration and to remove global barriers within forensic science. To prepare students for the world of work, it is pivotal that forensic science curricula address the needs of the present-day society and the requirements of the forensic providers (laboratories and law enforcement agencies). The present manuscript describes the first forensic science international curriculum between Australia (Murdoch University) and Malaysia (Universiti Kebangsaan Malaysia/UKM Forensics), possible through the New Colombo Plan of the Australian Government. The course outlined here, comprehensively comprised of lectures, workshops and mixed group crime scene simulations, provided Australian and Malaysian students with an authentic, intercultural and cross-jurisdictional learning experience to acquire work-ready skills.

Introduction

Forensics is the science of associating people with places and events, the application of science in a criminal investigation or court of law (Houck & Siegel, 2015). Since the dawn of history, crimes and forensic investigation have always been associated with human society. In fact, the term “forensic” originates from the Latin “forensis” (“of or before the forum”; Rendich, 2010), honouring the ancient Roman era in which both sides of a criminal case were presented in the “forum” (Rendich, 2010), which was the centre of the day-to-day life in Rome. The forum provided a meeting place for public speeches, criminal trials, gladiator matches and commercial affairs to happen. In this setting, the fate of the case and people involved was decided simply by favouring the individual with the best argument and delivery (Geraci, 2011). Standardised forensic practice considering the correct and consistent application of the scientific method, protocols and procedures, is only a recent achievement. Starting in the 16th century with the forensic pathology studies of Ambroise Paré, Paolo Zacchia and Fortunato Fidelis (Jones & Johnstone, 2011), followed by the chemistry studies by Carl Wilhelm Scheele in the 18th century (Smeaton, 1986), and the observations in the fields of ballistics, anthropometry, fingerprints and forensic entomology performed by Henry Goddard, Alphonse Bertillon, Sir William Herschel and Jean Pierre Mégnin, respectively, during the 19th century (McDermid, 2015). In 1888, medical doctors were asked for the first time to interpret wound patterns on the victims of Jack the Ripper (Bucholtz & Lewis, 2015), but it was not until the 20th century that forensic science, in general, established itself and became largely regulated within the process of criminal investigation (Bucholtz & Lewis, 2015).

With or without the scientific twist, investigation and mystery have always caught the public’s attention and fascinated their imagination. The first crime fiction-like narrative is dated 429 BC, and it is the Greek tragedy “Oedipus Rex” by Sophocles, which is focused on the search for the murderer of the previous king (Sophocles & Dawe, 1982). The first confession of murder, instead, can be read in the biblical Book of Genesis: Cain murdered his brother Abel and confessed to God (Holy Bible, Book of Genesis). Since the 19th century, several murder mystery stories have been released, but it is only in the last twenty years that the science behind the investigations has become a sensation. With the rise and success of crime drama series such as “Crime Scene Investigation” (CSI), television has become saturated with forensic science and investigative shows, giving rise to a new phenomenon colloquially known as the “CSI-effect” (Heinrick, 2006). The “CSI-effect” is the belief held by popular media that lay jurors’ understanding of forensic science and investigation can be influenced by crime drama television shows due to their perceived realism of the narrative licence taken by screenwriters (Heinrick, 2006). These misconceptions surrounding the process of investigation and the potentiality of the forensic science have become particularly problematic in court: one study comparing CSI viewers and non-CSI viewers found the viewers to be more critical of forensic evidence presented and 11% less likely to convict than their non-viewer counterparts (Schweitzer & Saks, 2007). Another consequence of the

“CSI-effect” is the glamorisation of forensic science, the forensic scientists and the general role of law enforcement in the society. The side-effect of this has been an increase of interest in forensic based courses in recent years (Heinrick, 2006). Although a lot of popular crime dramas like CSI are American, the popularity and consequently the “CSI effect” extend internationally, and an increased interest in forensic science courses has been documented across Australia. A study performed for the Australian Council of the Deans of Science on the statistical pattern of STEM in Australia from 2002 to 2015, indicated a 256% growth in full-time equivalent Forensic Science students (from 193 in 2002 to 688 in 2015) (Dobson, 2018).

Until the beginning of the 1900s, forensic science was self-taught and carried out exclusively through law enforcement agencies, while formal training and specialised courses were non-existent within any university settings (Bucholtz & Lewis, 2015). Forensic science formally developed into an academic discipline when Professor R. A. Reiss at the University of Lausanne (Switzerland) pioneered the first forensic science curriculum in 1902 (Bucholtz & Lewis, 2015). This innovative curriculum ultimately led to the introduction of criminalistics and police science into Universities during the 1930s (Bucholtz & Lewis, 2015). Nowadays forensic science courses are still integrated with the training of law enforcement, but they can also be undertaken on their own at both undergraduate and post-graduate levels in several universities.

In Australia and Malaysia, forensic courses were introduced in 1994 (Bachelor of Applied Chemistry in Forensic Science at University of Technology Sydney; Lewis, 2005) and 2000 (Bachelor of Science (Forensic Science) (Hons.) at Universiti Sains Malaysia; University Sains Malaysia, 2018), respectively. In Australia, students can either pursue a specific bachelor degree majoring in forensic science (single major) or pair it with two or three majors (double major or triple major), typically in a complementary field of science (e.g. chemistry, molecular biology, laboratory science, biology) or a course of another nature (combined degree e.g. criminology, crime science, information technology, media). Furthermore, in Australia, specific postgraduate degrees (Honours, Certificate, Diploma, Master) are offered. In Malaysia, instead, the only option is to undertake a Bachelor of Forensic Science with Honours course. To note, in both Australia and Malaysia, enrolment is based on minimum entry requirements set by the universities.

As an interdisciplinary field of study, forensic science incorporates different disciplines such as those that would typically fall under the umbrella of nature and life sciences (e.g. biology, entomology, chemistry, toxicology, and anthropology) and those within the social sciences (e.g. criminal justice, criminological psychology and criminology). While according to the public opinion “Forensics is a highly specialised career and there are only a few employment opportunities in the occupation” (Dobson, 2018), typically, at an undergraduate level forensic science students will be exposed to many scientific disciplines. This allows the student to obtain a diverse range of skills that start at the scene of a crime and carry through to its end in court. This encourages the development of research skills and critical thinking,

learning about procedures, interpretation of the evidence, technical reports and court appearance. Additionally, soft skills acquired (e.g. initiative, independence, teamwork, communication and problem solving) are transferable to a considerable number of jobs, broadening the expertise of forensic science students and expanding employment prospects beyond the traditional career paths of forensic investigation or law enforcement (University of Hull, 2019). At the post-graduate level, forensic science students are trained to become a specialist in one of the above-cited disciplines or field of study.

To prepare students for the world of work, it is pivotal that forensic science curricula address the needs of the present-day society and forensic providers (law enforcement and laboratories). This also reflects the call for a focus on work-integrated learning and employability currently dominating the higher education sector in Australia and the UK (Bennett, 2016). The research confirms that to identify and develop the skills and attributes needed to navigate post-graduation pathways, higher education students need timely and informed support. Graduates assert that the lack (or under development) of these skills and attributes is one of the most critical disadvantages encountered by graduates transitioning into work (Bennett, 2016).

Indeed, the forensic science community has ongoing obligations to adapt and evolve as obstacles and opportunities present themselves. Therefore, issues within forensic science need to be continually challenged and reflected in the course structure and the educational model. With the prevalence of global issues such as mass disasters (e.g. boat sinking, plane crashes, tsunamis, earthquakes) and international crimes (e.g. piracy, suspicious death of people in a foreign country or in international waters) (Lewins, 2016), it has catalysed the need for international collaboration and to remove global barriers within forensic science. Although there is a clear need for forensic scientists to learn to work across jurisdictions and cultural barriers until now the higher education sector has failed to provide this in their current curricula. The New Colombo Plan (NCP) project "Breaking down barriers for justice: an intercultural approach to Crime Scene Investigation" (referred as #BreakingBarriers herein, as the social media hashtag used to promote the project on social media) represent an innovative model of forensic education aimed to integrate the teaching of technical and scientific skills as well as understand cultures, religions, and different ways to approach crime scenes working together in a mixed team. Participants experienced other ways of knowing and practising forensic science, expanding their world view. It also ensured that the students would learn to look beyond their local or national perspective in the field simulations (Cary, 2006). Overall, this project aimed to meet the needs of the students and the profession, by engaging in authentic experiences that aim to produce 'employable' forensic scientists (Herrington & Herrington, 2006).

The goal of this manuscript is to present the first forensic science international and intercultural experience where Australian and Malaysian forensic science students gathered together for a teaching and learning experience in forensic science. The project took place for the first time in June 2018 in Malaysia, financed by the Australian Government NCP

mobility program and organised in collaboration between Murdoch University (MU) and Universiti Kebangsaan Malaysia/UKM Forensics (UKM). The 2018 pilot project facilitated five MU student participants, while the following editions (2019 and 2020) saw a doubling of the intake, with ten students per experience. The structure of the short course, as well as the logistical aspect and the student feedback, will be discussed. This course was a practical work-integrated learning experience that implemented an internationalised curriculum, to integrate intercultural perspectives and applied authentic pedagogy (Wiggins & McTighe, 2012).

Project details

The New Colombo Plan (NCP) program is an initiative of the Australian Government which aims to lift knowledge of the Indo-Pacific in Australia by supporting Australian undergraduates to study and undertake internships in the region (Australia DFAT, 2019a). The NCP is a mobility grants program, for which the bottom-line is the collaboration between an Australian University and a University within the Indo-Pacific region. The two institutions are required to develop a project that will see Australian students moving to the Indo-Pacific University, that will host the students and the project. Students of the Indo-Pacific University may or may not be part of such a project.

With regards to the NCP, the MU-UKM #BreakingBarriers project is the first international course in forensic science that has promoted collaboration between Australian and Malaysian institutes, students and staff. This included the opportunity for Australian students and academic staff to travel to UKM Forensics in Bangi, Selangor, Malaysia. The project was a two-week intensive course focused on the collaboration between the institutions and the forensic science students of both undergraduate cohorts. The unique internationalised curriculum aimed to integrate intercultural and global perspectives into higher forensic education, enhancing the skillset and cultural competency of graduates and staff through academic mobility (Leask, 2015).

Project description

A crime or disaster scene may occur in locations that are cross-jurisdictional and may involve victims of different nationalities. In such complex situations, forensic experts and law enforcement agencies of different nationalities and with different skill bases need to communicate and collaborate. In this NCP project, Australian undergraduate forensic students were provided with the unique opportunity to apply knowledge for their studies to investigate mock scenarios in Malaysia, working alongside fellow Malaysian undergraduate forensic students. This experience exposed Australian students to the application of the best practice in forensic science across different geographical regions, under different laws and regulations. Furthermore, Australian and Malaysian students were provided with the opportunity to work with individuals from different backgrounds and cultural groups, overseen and trained by local investigators and forensic experts. This project provided forensic students

who will become forensic experts (e.g. DVI, Disaster Victim Identification experts) to cooperate with overseas colleagues and to become forensically aware across cultures in the application of crime scene analysis. This project is constructively aligned, drawing upon collaborative learning experiences to facilitate a more informed cross-cultural understanding in the field (Biggs & Tang, 2007; Johnson, 1998).

Student recruitment

Student recruitment required the selection of five (for the 2018 pilot edition) or ten (2019 and 2020 for the following editions of the project) MU forensic students. In terms of MU students' selections, the initial step included an advertisement on the MU website, with details of the course to prospective forensic students. MU eligibility to apply was defined as undergraduate students enrolled in Forensic Biology and Toxicology entering their final year of study, students with a particular interest in crime scene investigation practice, positive and proactive attitude, open-minded and adaptable to new situations, environments and team. Furthermore, MU students also needed to address additional criteria to meet NCP requirements (e.g. be an Australian citizen aged 18-28 years). As an expression of interest, applicants were asked to submit a written statement conveying why they wanted to participate in the course. Students were subsequently shortlisted by suitability and invited to interviews. During the interview, MU students were asked a series of questions on their statements and what they hoped to gain from the experience. After assessment of suitability, each candidate was to understand possible language barriers, differences in culture, food, risk and work policies they may face. The final selection was narrowed to those who would make a good ambassador for MU and Australia. The applications and the interviews were assessed by the MU academic project leader, who shortlisted and identified the right candidates for the experience (Australia DFAT, 2019b).

UKM students participating in the project were the whole cohort of the third year of the Bachelor of Forensic Science (Hons.) (24 students per cohort) registered for the short CSI course (NNNX3182 Crime Scene Investigation II) at UKM, which is offered from July-August each year. This course was an extension of the course offered earlier in the semester, NNNX3232 Crime Scene Investigation I. However, five students from the cohort were selected to coordinate the activities with MU students. This selection specifically involved English language assessment, personal drive and availability.

Pre-departure preparation

Prior to departure, Australian students were invited to attend cross-cultural training designed exclusively for NCP recipients. The training session addresses cultural, social and differences in communication style between Australia and the Indo-Pacific host country. Such sessions aim to teach students how to be a good ambassador for Australia, while also providing workable strategies for departing students for immersion into the host culture from day one of arrival.

The sessions are intended to support the future endeavours of participants. As part of the pre-departure preparation, NCP Australian students, as well as their project leader and MU representatives, were invited for a visit to the Consulate-General of Malaysia in Perth (WA) and a meeting with the Education Attaché of Malaysia in Perth, WA (2018) and the Australian High Commission to Malaysia in Kuala Lumpur (2019). Meanwhile, students at UKM had already undertaken a basic course in CSI during the previous semester, i.e. NNNX3232 Crime Scene Investigation I. Participating students were briefed on course content and activities which involved mixed groups of MU and UKM students. As non-English native participants, UKM students were encouraged to improve their interpersonal skills by using English in teamwork activities and formal or informal communications.

As this represented the first international and intercultural project in forensic science education, it received media attention in both Australia and Malaysia. Project leaders as well as students were hosted in several radio programs and featured in national newspaper and website (Hiatt, 2017).

Project development

The #BreakingBarriers project was developed as a mixture of lectures, seminars, workshops, site visits, laboratory work and hands-on individual learning or as groups, designed to provide participating students and staff with unique learning and teaching experiences. Edelson et al. (1999) outline the importance of authentic learning as "authentic activities provide learners with the motivation to acquire new knowledge, a perspective for incorporating new knowledge into their existing knowledge and an opportunity to apply their knowledge". Hung, Tan, and Koh (2006) explain that authentic learning allows engaged students 1) learn in spite of an ill-defined problem, 2) experience uncertainties as well as the social nature of science, 3) enables learning to be driven by demand to apply current knowledge, 4) obtain experience in a community setting in which practices, knowledge, resources and discourses are ultimately shared, and 5) to draw on the expertise of their pairs and advisors in area which they need to develop. Field-based simulated scenarios providing hands-on learning and were to be a core component of the #BreakingBarriers project to provide students with valuable authentic experience.

The coursework aimed to broaden participants understanding of the law and the investigation protocols in the Indo-Pacific region and be better prepared to participate in cross-jurisdictional forensic investigation, such as a mass-disaster in which DVI units of different countries work together; as such, the course was to have a keen focus on multidisciplinary and intercultural components. As the students and staff in #BreakingBarriers come from a diverse background, it was not only important to embrace intercultural learning/teaching, but it was pivotal to make the learning/teaching accessible. Aspects considered when developing the syllabus can be separated into two categories 1) the learning/teaching experience 2) accessibility of content.

The learning-teaching experience considered the incorporation of regional and international case studies, multidisciplinary course work, multicultural, religious and complex ethical components with both a region-specific and a global focus, and inclusion of industry professionals and academics, both local and international. As per accessibility of teaching and learning facilities, English was used as a common language, but a basic Malay language training was provided upon arrival. For the whole duration of the project, translation and clarification of colloquial terms or idioms were provided, if/when needed.

Forensic coursework project

The ten days of course work involved crime scene simulations, student discussions and presentations, learning visits, lectures from academics and industry professionals including the former head of Royal Malaysian Police CSI, Malaysian Coast Guard, forensic pathologists, odontologists, entomologists and DVI experts of both Malaysia and Australia. An open discussion about the difference between the Australian and the Malaysian sheets was driven by the students, proposing a final perfect blend between the two.

A core component in the #BreakingBarriers project was the crime scene simulation (CSI), these were extremely beneficial for understanding the complex and multidisciplinary nature, as well as the general requirements of an investigation. It is noteworthy that during their course of study, MU undergraduate students are not provided with experience in a mock criminal scenario, therefore this was the first hands-on experience that allowed them to collate the knowledge obtained in their former studies. The short course contained two distinct CSI simulations. The first scenario was a maritime scenario, a crime happened on a boat, facilitated by the Malaysian coastguard (Malaysian Maritime Enforcement Agency, MMEA), utilising mannequins used to simulate human victims. The second scenario was focused on body decomposition in the wood (UKM "body farm"), with animals (rabbits) displayed in different ways and investigated at different stages of decomposition. The crime scene scenarios were set up to allow students to work together, apply skills and formulate conclusions. Learning visits and lectures saw students and staff travel to Polis laboratories, The Wildlife Forensic Laboratory, Hospital Serdang; covering multidisciplinary course work i.e. forensic investigation, toxicology, digital forensics, document analysis, ink analysis, impressions analysis, odontology, pathology, entomology, aquatic forensics and mass disaster protocol.

Cultural experience within the project

As part of the NCP philosophy, besides acquiring technical skills, Australian students are granted the opportunity to embrace the Indo-Pacific culture. Authentic experiences of this sort become an "episode of learning" in itself, engaging students and allowing them to concentrate on worthwhile skills and practical strategies (Wiggins, 2011; Wolf, 1989). The MU cohort also had the opportunity to interact with their fellow students from UKM outside of the educational setting, taking part in a range variety of social and cultural

activities to build relations for the present and the future. Australian students were invited to discover cities like Kuala Lumpur and Malacca, as well as joining the cultural tradition of Eid Mubarak, wearing traditional clothing and acquiring Malaysian cooking skills.

Student assessment

MU and UKM students were marked separately. MU students were assessed on their engagement during the unit, from the pre-departure activities to the writing of the self-reflection diary after the experience. Engagement makes students responsible for their own learning and enables them to massively gain from the experience; while also teaching students soft skills like teamwork, effective communication and making them accountable for their own performance (Parsons & Taylor, 2011; Wolf, 1989). MU students were asked to prepare two public presentations, the first one at their arrival, introducing themselves and their background, and a final one. In the last, students were asked to give an account of the experience, things that worked and identifying areas where there is room for improvement in the future. Additional study components required MU students to keep a personal journal/study log and answer several questions before and after the trip, under the form of a self-reflection diary. Self-reflection is a process that gives students opportunities to stop and be reflective about the learning that has taken place (Davies, 2013). It has been proven that self-reflection can naturally activate further engagement with learning material, deepen learners' understanding of the topic and reinforce independent thinking and in that way create an effective learning environment (Park, 2003). Specifically, for this experience, the study log drew on a standard structure of higher education learning. Before the trip, the questions were asked: a) Why you wanted to participate in the project? b) Expected return from the study experience; while after the trip: c) How do you think the international experience will help your future career? d) Has the experience helped you identify an area you would like to specialise in? e) Provide specific examples of how the experience has put you in a better position for applying to jobs after graduation.

For the UKM students, the whole 2018 cohort was assessed based on their performance in crime scene simulations with MU students, plus additional final group presentations and crime scene reports. Particular attention was given to the peer judgements on teamwork and to the self-assessment ability in collaborative group work (Sridharan & Boud, 2019; Sridharan, Tai, & Boud, 2019).

For the 2019 cohort, instead, activities with MU students were not part of the final assessment for UKM students due to limited capacity at the MMEA to conduct mock CSI. Only ten students out of 24 students were randomly selected to join mock CSI with MU students. However, UKM students were evaluated based on rubric assessment to assess their ability, including feedback from MMEA officers as instructors.

Discussion

The definition of internationalisation varies considerably across literature. However, a commonly accepted interpretation comes from Knight (1994), who describes internationalisation of higher education as “the process of integrating an international and intercultural dimension into the teaching/learning, research and service functions of the institution” (p. 3). Mechanisms of internationalisation include the curriculum, various academic activities, recruitment of international students or staff/student exchanges (Knight, 1994). Other elements of internationalisation include organisational factors such as annual planning, policy and reviews (Knight, 1994). The underlying motivation of internationalisation in higher education is immensely complex, and many factors – not necessarily mutually exclusive – may be considered (Knight, 1994). The motivation differs between developing and developed nations (Tran & Dempsey, 2017); for some countries, internationalisation of education may be motivated by engagement, cooperation, economic, political, sociocultural, humanistic, developmental or academic factors (Knight & Wit, 1997; Tran et al., 2014). Internationalisation philosophy is different for different countries. For Asian countries, internationalisation of education can be underpinned by the desire to develop a more qualified workforce (Tran & Dempsey, 2017) or intercultural understanding and engagement on a national and global scale (Tran et al., 2014). For other countries like Australia, instead, the focus is engagement, cooperation (Beazley, 1992; Tran et al., 2014), tackle global challenges (Beazley, 1992) as well as commercialisation and marketisation (Tran & Dempsey, 2017). The reason for choosing one of the aforementioned underpinning factor over another is depended on the institution, resources and the relevant mandate (Knight, 1994).

With regards to forensic science and law enforcements, Australia and Malaysia both have university-level forensic science courses that prepare students to apply to work predominantly in forensic industry (laboratories) and law enforcement agencies (e.g. national and federal Police and Coast Guard) that train officers to work mainly within the territory. In situations of mass disasters that see (or suspect) victims of both nationalities, DVI experts and officers of these countries gather together to investigate the case. Examples are the investigation following the tsunami in Thailand (2004) and the plane crashes of MH370 (2014) and of MH17 (2014). While experts investigating such cases are typically not afforded the chance to meet for training purposes before the disaster, in 2019, a collaborative initiative saw officers of the Australian Border Force (ABF) and the Malaysian Coast Guard (MCG) came together for the twelfth time under the “Red Back Operation” (Australia Border Force, 2019). This is a week-long combined patrol that takes place along the waters of the Malacca Strait, combating maritime security threats including people smuggling and human trafficking. This operation is a great opportunity to affirm the important relationship that exists between Malaysia and Australia. Furthermore, and more importantly, it allows the ABF and MCG to be better prepared to effectively deal with the broad range of maritime security challenges we face, both independently and together as partners. To the knowledge

of the authors this is the only combined forensic program between Australia and Malaysia. Similar programs are not available outside of a military or law-enforcement setting.

#BreakingBarriers as an NCP guided project endeavoured to promote engagement with the Indo-Pacific region, enhance knowledge and create “work-ready graduates” (Australia DFAT, 2019c). Furthermore, MU and UKM both identified cultural understanding and academic factors as core imperatives. The mechanism by which this was achieved is through student/staff mobility as well as the implementation of an internationalised curriculum. The aim of internationalisation in education is not to standardise the curriculum, simply incorporate intercultural perspectives (Mihut, 2017), share the teaching and learning experience, ideas and resources, which is of clear interest in higher education.

A 2015-2016 systematic study conducted by the Centre for Studies in Higher Education interviewed more than 100 universities, community and government leaders to gauge their perceptions of the Australian university sector (Lacy, Croucher, Brett, & Mueller, 2017). The study was specifically focused on the present and future opportunities, issues and challenges and recognised 32 facing Australian universities, of which participants viewed internationalisation to be among the top four most important for ensured health and growth of the sector (Lacy et al., 2017). In addition, there was a noted increase in recognition of the importance of internationalisation for higher education, especially at an undergraduate level (Lacy et al., 2017). As well, a survey conducted by the European University Association survey of staff across 46 countries and 451 institutes found that 92% of respondents believed internationalisation enhanced both the learning and teaching experience at their University (Lacy et al., 2017; Sursock, 2015). Through internationalised curricula and/or specific experiences during their course of study, students can gain qualifications that are of value globally and can be later used to expand their job prospects (Lacy et al., 2017). As a symbiotic relationship internationalisation allows students and staff to contribute to the global initiative whilst being shaped by it. While in excess of five million tertiary students per year are moving globally for education (Hénard, Diamond, & Roseveare, 2012), mobilisation of forensic students is still extremely limited.

Gacel-Ávila (2005) believes that internationalisation of higher education relies on three distinct factors: a) its acceptance as an integral, central, and fundamental part of educational policy that can improve the quality and relevance of education, implemented through comprehensive strategies to help transform educational systems to meet the needs of a global society; b) the strategic role of international academic cooperation in globalising solidarity among nations and establishing a true global citizenry; and c) more attention paid to the theme of internationalisation in educational research.

Such factors were totally fulfilled by the cooperation between MU and UKM for the #BreakingBarriers NCP program, as students of both Australian and Malaysia were exposed to learning activities of great needs in the global nowadays

society (factor “a” above (Gacel-Ávila, 2005)), improved the understanding of each other’s backgrounds and customs (factor “b” (Gacel-Ávila, 2005)) and put the bases of their future work in an international set up (factor “c” (Gacel-Ávila, 2005)).

A groundbreaking moment of the whole project, and arguably the most valuable aspect of #BreakingBarriers, was the practical CSI simulation in mixed groups. During the CSI simulation, students were able to bring the theoretical techniques learnt during the undergraduate coursework into a practical ‘real world’ simulation. Although the value of conventional lecture-learning is not to be overlooked, the simulation provided an interactive experience able to thoroughly enrich and enhance the understanding of both scientific concepts and the importance of certain soft skills such as teamwork and effective communication with your CSI team which are pivotal competencies required when working alongside other people, either students or colleagues.

Additionally, the intercultural nature of the simulation allowed Australian and Malaysian students to gain an understanding, as well as an appreciation for different aspects that need to be considered with working with individuals of different cultures, religions, heritage, age and gender; students confirmed that this experience helped them to develop an understanding and the skills to be able to recognise and respectively accommodate the differences to ensure the smooth function of the simulation groups. This authentic and immersive learning experience provided skills that will be highly transferable and immensely valuable moving forward in the forensic community and in general in the world of work (Perry, 2004). By providing a culture of practical, hands-on experiences, students gradually become more inquisitive and active in their own learning – solving problems, developing communication skills with their peers and cultivating sustained shared thinking. A great work of planning is required but staff members to create an authentic and immersive learning environment, can be time-consuming and strenuous for educators; however, the benefits are endless. The real environment, compared to book-based learning, is of a great stimulus to enhance the students’ senses and give life to real experiences and encourages the students to be engaged. Immersive learning, especially in an international setup sparks discussion, exploration, discovery and contemplation, that will reflect on their own thinking (Chawla, 2019).

Conclusion

The prevalence of global issues such as mass disasters and cross-jurisdictional crimes has catalysed the need for international collaboration within the forensic industry. To prepare students for the world of work and provide them with an industry-ready skillset, it is pivotal that forensic science curricula address the needs of the present-day society. This article described the first forensic science international curriculum between Australia and Malaysia. The course outlined is a transformative approach to teaching, which inspires learning by providing students with an engaging, dynamic and authentic cross-jurisdictional and intercultural

learning experience to acquire work-relevant skills. Lectures and workshops by international industry experts throughout #BreakingBarriers provided the theoretical basis for mass disaster response and international crime investigation, scaffolding the learning. Thereafter, practical CSI simulations acted as a stimulus for learning, providing students with the opportunity to implement prior knowledge in an authentic environment, working alongside future forensic experts from a diverse cultural background and different disciplines. In this context, problem-based learning skills – a combination of collaboration, cooperation, knowledge sharing and independent work – are integral to foster the development of the students to be work-ready (Helle, Tynjälä, & Olkinuora, 2006).

It is indeed a new era in forensics, and while not every forensic student will end up being employed abroad, many will work in a multicultural work environment, or in positions/ companies which collaborate on a global scale. Forensic scientists will find themselves facing new challenges with a global element. Therefore, to prepare for the interconnected world, future generations of Australian forensic experts need to learn to work together in different countries, beside colleagues with different cultural backgrounds, making internationalisation imperative for 21st-century education (Gacel-Ávila, 2005).

For several universities worldwide, there are plans to dramatically increase their global impact, creating a meeting point for innovation, study, research and business. MU and UKM being both situated in the Indo-Pacific zone, aim to extend their global reach in international education, improving the collaboration in the region. For MU, this will be achieved through strategic appointments, introducing a more internationalised curriculum and “porous borders”, enabling students and staff to enhance their international perspective, creating global forensic citizens who are equipped to embrace an interconnected and more interdependent world. For UKM, instead, intentions are to welcome more foreign universities to participate in their programmes.

International forensic programs and projects are crucial in our modern, interconnected society as it provides students with strategic skills to meet the requirements of a world with no barriers. Students participating used the experience as a trampoline to commence their career as forensic officers or to continue in their study focusing on research in forensic science. In both cases, this can be attributed to the enrichment of their CV. With such a positive outcome, both MU and UKM aim to continue and improve such projects in the future, breaking down the barriers of the old school forensic science education and embracing an innovative and authentic way of learning.

Acknowledgements

This experience was made possible by the Australian Government through the New Colombo Plan, who provided the mobility grants for the participants. A special thanks to the former Education Attaché of Malaysia at the Consulate-General of Malaysia in Perth Mr Abdul Hadi Mustaffa and

Mr Andrew Goledzinowski, Australian High Commission to Malaysia in Kuala Lumpur.

However, the biggest thank you goes to the students and staff of Murdoch University and UKM Forensics who believed in this innovative work-integrated learning experience opportunity. In particular, Prof. Lyn Karstadt and Ms Jeannette Geesmann at MU. At UKM, we are grateful to the support from Ms Atiah Ayunni Abdul Ghani, Ms Norwahida Zamani, Mr Balkhis Bashuri, Abdul Aziz Ishak, Mr Muhamad Hilmi Baba, Mr Mohd Rafie Lim Ros Lim, UKM Forensics academic staff and UKM Global.

A particular acknowledge goes to the forensic experts from academia and industry, who provided us with guest lectures and expertise in the field. In particular, the ex-Head of Royal Malaysian Police CSI, Mr. Amidon Anan; UKM Forensic Odontologist, Dr. Nor Atika Md. Ashar; and Kuala Lumpur Hospital Forensic Science Officer, Dr. Khoo Lay See. Special thanks for UKM strategic partners, the Malaysian Maritime Enforcement Agency, Wildlife Forensics (Department of Wildlife and National Parks Peninsular Malaysia), Royal Malaysian Police and Forensic Department of Serdang Hospital.

Finally, the authors would also thank Dr Lisa Cary for her valuable input in writing this manuscript and the two reviewers for their helpful comments.

References

- Australian Border Force. (2019). *Australia and Malaysia continue partnership to combat people smuggling. Operation Sovereign Borders*. Retrieved from newsroom.abf.gov.au
- Australia Department of Foreign Affairs and Trade (DFAT). (2019a) *New Colombo Plan*. Retrieved from <https://dfat.gov.au/pages/default.aspx>
- Australia Department of Foreign Affairs and Trade (DFAT). (2019b). *New Colombo Plan Guidelines Scholarship Program*. Retrieved from [Retrieved from https://dfat.gov.au/pages/default.aspx](https://dfat.gov.au/pages/default.aspx)
- Australia Department of Foreign Affairs and Trade (DFAT). (2019c). *About the New Colombo Plan*. Retrieved from <https://dfat.gov.au/pages/default.aspx>
- Beazley, K. (1992). *International Education in Australia through the 1990s*. Canberra, Australia: Australian Government Publishing Service.
- Bennett, D., Richardson, S., & MacKinnon, P. (2016). *Enacting strategies for graduate employability: How universities can best support students to develop generic skill*. Part A. Canberra, ACT.
- Biggs, J., & Tang, C. (2007). *Teaching for quality learning at university*. Maidenhead, England: McGraw-Hill Education.
- Bucholtz, A., & Lewis, J. (2015). *Biological Evidence*. San Clemente, CA: LawTech Publishing Group.
- Cary, L. J. (2006). *Curriculum spaces: Discourse, postmodern theory and educational research*. New York, NY: Peter Lang.
- Chawla, M. (2019). Immersive Learning - Bringing Learning to Life through Immersive Experiences. In *Cognizant 20-20 Insights* (pp. 1-10).
- Davies, A., Herbst, S., & Busick, K. (2013). *Quality assessment in high schools: Accounts from teachers*. Bloomington, IN: Solution Tree Press.
- Dobson, I. (2018). *STEM in Australia: The statistical patterns of university science and technology in the twenty-first century*. The Educational Policy Institute Pty Ltd. Retrieved from <http://www.acds.edu.au/wp-content/uploads/sites/6/2018/10/ACDS-STEM-in-Australia-Final28-10-18.pdf>
- Edelson, D., Gordin, D., & Pea, R. (1999). Addressing the challenges of inquiry-based learning through technology and curriculum design. *Journal of the Learning Sciences*, 8(3-4), 391-450.
- Gacel-Ávila, J. (2005). The internationalisation of higher education: A paradigm for global citizenry. *Journal of Studies in International Education*, 9(2), 121-136.
- Geraci, G., Marcone, D., Cristofori, A., & Salvaterra, C. (2011). *Storia romana*. Le Monnier Università.
- Heinrick, J. (2006). Everyone's an expert: The CSI effect's negative impact on juries. *The Triple Helix*, 3(1), 59-61.
- Helle, L., Tynjälä, P., & Olkinuora, E. (2006). Project-based learning in post-secondary education—theory, practice and rubber sling shots. *Higher Education*, 51(2), 287-314.
- Hénard, F., Diamond, L., & Roseveare, D. (2012). *Approaches to internationalisation and their implications for strategic management and institutional practice*. OECD Higher Education Programme IMHE.
- Herrington, J. A. & Herrington, A. J. (2006). Authentic conditions for authentic assessment: aligning task and assessment. In A. Bunker & I. Vardi (Eds.), *Proceedings of the 2006 Annual International Conference of the Higher Education Research and Development Society of Australasia Inc (HERDSA): Critical Visions: Thinking, Learning and Researching in Higher Education: Research and Development in Higher Education*, Volume 29 (pp. 141-151). Milperra, NSW: HERDSA.
- Hiatt, B. (2017, September 7th). Crash skills for CSI crew. *The West Australian*.
- Holy Bible, Book of Genesis. In Vol. 4. (pp. 1-18).
- Houck, M., & Siegel, J. (2015). *Fundamentals of forensic science* (3rd ed.). San Diego, CA: Academic Press.
- Hung, D., Tan, S., & Koh, T. (2006). Engaged learning: Making learning an authentic experience. In S. K. Myint (Ed.), *Engaged learning with emerging technologies* (pp. 29-48). Dordrecht, Netherlands: Springer.

- Johnson, R., & Johnson, D. (2008). Active learning: Cooperation in the classroom. *The annual report of educational psychology in Japan*, 47, 29-30.
- Jones, M., & Johnstone, P. (2011). *History of criminal justice*. New York, NY: Routledge.
- Knight, J. (1994). *Internationalization: Elements and Checkpoints*. CBIE Research No. 7. Canadian Bureau for International Education.
- Knight, J., & Wit, H. D. (1997). *Internationalisation of higher education in Asia Pacific countries*. Amsterdam, Netherlands: European Association for International Education.
- Lacy, W., Croucher, G., Brett, A., & Mueller, R. (2017). *Australian universities at a crossroads: Insights from their leaders and implications for the future*. UC Berkeley Research and Occasional Papers Series. Retrieved from <https://escholarship.org/uc/item/9d80g6cw>
- Lewins, K. (2016). *International carriage of passengers by sea*. London, England: Sweet & Maxwell.
- Lewis, S., Brightman, R., & Roux, C. (2005). Forensic science tertiary education in Australia. *Chemistry in Australia*, 73(3), 4-8.
- McDermid, V. (2015). *Forensics: What bugs, burns, prints, DNA and more tell us about crime*. London, England: Profile Books.
- Mihut, G., Altbach, P., & de Wit, H. (2017). *Understanding higher education internationalization. Global perspectives on higher education* (Vol. 39).
- Park, C. (2003). Engaging students in the learning process: The learning journal. *Journal of Geography in Higher Education*, 27(2), 183-199.
- Parsons, J., & Taylor, L. (2011). Improving student engagement. *Current Issues in Education*, 14(1), 1-33.
- Perry, J. E. (2004). Authentic learning in field schools: Preparing future members of the archaeological community. *World Archaeology*, 36(2), 236-260.
- Rendich, F. (2010). *Dizionario etimologico comparato delle lingue classiche indoeuropee: Indoeuropeo, sanscrito, greco, latino*. Rome, Italy: Palombi.
- Schweitzer, N., & Saks, M. (2007). The CSI effect: Popular fiction about forensic science affects the public's expectations about real forensic science. *Jurimetrics*, 47, 357-364.
- Smeaton, W. (1986). Carl Wilhelm Scheele (1742-1786). *Endeavour*, 10(1), 28-30.
- Sophocles, & Dawe, R. (1982). *Oedipus Rex*. Cambridge, England: Cambridge University Press.
- Sridharan, B., & Boud, D. (2019). The effects of peer judgements on teamwork and self-assessment ability in collaborative group work. *Assessment & Evaluation in Higher Education*, 44(6), 894-909.
- Sridharan, B., Tai, J., & Boud, D. (2019). Does the use of summative peer assessment in collaborative group work inhibit good judgement? *Higher Education*, 77(5), 853-870.
- Sursock, A. (2015). *Trends 2015: Learning and teaching in European universities*. European University Association.
- Tran, L., & Dempsey, K. (Eds.). (2017). *Internationalization in vocational education and training: Transnational perspectives* (Vol. 25). Cham, Switzerland: Springer Nature.
- Tran, L., Marginson, S., Do, H., Do, Q., Le, T., Nguyen, N., Nguyen, H. (2014). *Higher education in Vietnam: Flexibility, mobility and practicality in the global knowledge economy*. New York, NY: Palgrave Macmillan.
- University of Hull (2019). *Using your Forensic Science degree to get a job: Making yourself employable*. Retrieved from Hydra website: hydra.hull.ac.uk
- Universiti Sains Malaysia (2018). *Bachelor of Health Science*. Retrieved from www.usm.my
- Wiggins, G. (2011). A true test: Toward more authentic and equitable assessment. *Phi Delta Kappan*, 92(7), 81-93.
- Wiggins, G., & McTighe, J. (2012). *Understanding by design framework*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Wolf, D. P. (1989). Portfolio assessment: Sampling student work. *Educational Leadership*, 46(2), 35-39.