Enrichment of forensic science employability skills through an international placement opportunity in Brazil

Ana Flavia Belchior de Andrade[1], Ian J. Turner[2*]

[1]School of Science, University of Derby, Kedleston Road, Derby, DE21 1GB UK. DOI: https://orcid.org/0000-0003-1004-0084
[2]Pedagogic Enhancement, Innovation and Research, University of Derby, Kedleston Road, Derby, DE21 1GB UK. DOI: https://orcid.org/0000-0002-5070-6621
[*]corresponding author: i.turner@derby.ac.uk

Abstract: The Turing Scheme funds learners from the UK to participate in international mobility schemes including short period studying abroad. International placements are thought to be a key element in equipping students with the necessary skills to transition from Higher Education and seek graduate level employment. This work evaluates the effectiveness of a four-week placement in the Federal District Civil Police in Brazil. The students' experiences were examined by thematically evaluating their responses in a semi-structured focus group to four pre-established themes i) forensic science attributes – the development and reinforcement of specific forensic science skills, ii) employability – enhancement of the prospects in seeking post-education employment, iii) cultural experience – the international nature of the placement allowed cultural exploration and a valuable leaning experience, iv) organization – recognition of the broader financial and social issues that could be a barrier to some students taking part in international placements. This study provides an insight into the views of a small group of forensic students on an international placement and highlights the potential value to students in respect to skill development, employment prospects and cultural enrichment in engaging in such activities. These placements do come with significant administrative burdens on the organizers and the small number of places and other barriers limits the opportunity to a small number of learners.

Keywords: employability, placement, Turing Scheme

Introduction

The Turing Scheme is a program initiated by the UK government that was developed to replace the UK's participation in the Erasmus+ program following the departure from the European Union (1). Through the Turing Scheme, students and learners from the UK can access funding to participate in international mobility programs, allowing them to experience different cultures, languages, and educational systems. The scheme also promotes global collaboration and cross-cultural understanding through championing widening participation and supporting shorter term mobility opportunities. The Turing Scheme is driven by four strategic objectives aligned to socio-economic and geo-political challenges i) promote 'Global Britain' through forging new relationships across the world, ii) support social mobility and widening participation across the UK, iii) to develop key skills bridging the gap between education and work and iv) ensure value for taxpayers in international social mobility (2, 3).

International placements are established and beneficial part of the university landscape and sit with in a broader picture of short-term international placements and experiences. Traditionally such placements were linked to formal international study exchanges where a student would study degree level awards (and receive course credit hours) for a period of up to a year. More recently there are broader range of offers that range from international work placements to gap-year programs.

Placements are a key element in preparing students for employment after graduation, equipping students with essential skills necessary for professional practice and easing the transition from university to the work environment (4, 5). Students engaged with workplace learning (WPL) develop greater independence and present greater autonomy at work (6) while connecting with current practice and emerging approaches in their field of studies. (5). The demand for placement provision is clear because of the perception they can provide routes into the labor market. Higher Education work placements have the potential to develop into permanent posts or assist with post job placement (7).

In an increasing globalized world, skills and cultural competence are essential to foster global citizenry in graduates. International placements have the advantage of

exposing the student to a new culture enhancing cultural awareness (8). Different authors hypothesis that fostering international placements has a significant impact in advancing global citizenship in graduates, reflected in great personal development and professional grow (9, 10, 11). Specifically in international placements it has been shown in a study of HE finances, that students who undertook international sandwich (gap) year show a statistically significant increase in final year marks and 'good honors' (>2.1) after undertaking their placement (12). Standley (13) notes that microbiology students on placements score higher than 'non-mobile' students but that differences exist prior to the experience, suggesting those students who are more employable are those furthering their advantage with international placements. It has been shown that work-based learning can be used as a successful strategy to bridge theoretical knowledge and practice and enhance graduate employability (14).

Scheme Overview

In November 2021, funding was successfully applied for from the Turing Scheme, via the University of Derby, UK for students to attend an international placement within the Federal District Civil Police (FDCP) in Brazil. The funding covered the cost of living for students with those from under-represented groups receiving a cost-of-living uplift, travel cost and the opportunity to claim exceptional travel costs such as health insurance and vaccines. The opportunity was advertised internally to students from BSc Forensic Science, BSc Forensic Science with Criminology, and BSc Forensic Science with Psychology programs who were on level five (2nd year) or six of their studies (3rd year). An optional briefing session with the facility for questions and answers was made available to all interested applicants. The selection process was based on an assessment rubric that considered two elements i) the students overall academic performance and ii) the answers provided in a questionnaire. The overall academic performance was measured as the average of all available grades for the student at that time when they registered interest in the placement. In the questionnaire students were asked to answer two questions a) why they were interested in the opportunity and b) how this opportunity could enhance their graduate profile. Points were awarded for any aspect that they could identify as beneficial for their future graduate prospects and additional points were awarded if the student recognized the positive cultural impact of the experience. The questionnaire responses were independently evaluated by two assessors, one of whom had no prior knowledge of the students. The five students with the highest overall scores were offered the opportunity to participate in the scheme. Four out of five students were classified as wide-participation students and provided with further funding as previous mentioned.

The placement took place over a four-week period in June 2022 (see **FIGURE 1**). The overarching aim of the scheme was for students to acquire hands on experience in a professional forensic science environment whilst learning from real casework. The placement was structured so that students developed skills in different forensic science disciplines, even in specialist areas that were not introduced before and a broad view of the whole subject.

In the first week students were presented to the different Institutes that house the forensic services in FDCP. These include the Criminalistic Institute responsible for crime scene investigations and different laboratory analysis, the Identification Institute in charge of fingermark analysis, the Legal Medicine Institute accountable for the autopsies and post-mortem analysis, and the Institute for DNA Research. They also visited the National Criminalists Institute at the Federal Police to provide a perspective on how the Forensic Services works nationally in Brazil.

From the second week onwards, students were placed in specific divisions/units to learn from practicing forensic experts analyzing real casework. Student had the opportunity to carry out a variety of tests and put in practice concepts that were only studied in theory before such as chain of custody. During this period, students visited the following units/laboratories: document analysis, arson and explosive, merceology, ballistics, forensic biology, forensic chemistry, DNA analysis and the cybercrimes unit.

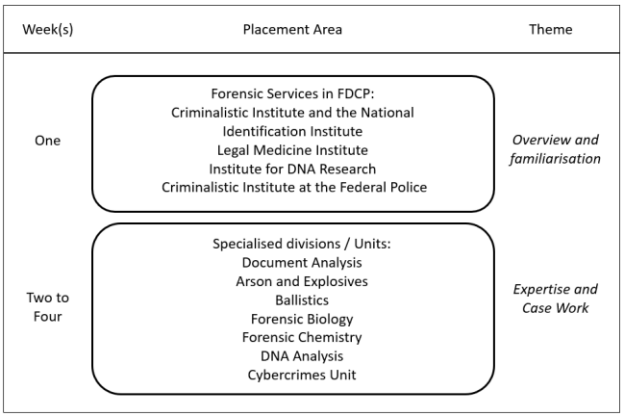

FIGURE 1 A schematic overview of the four-week placement by forensic students in Brazil, highlighting the areas where the placement was undertaken and the pedagogic focus.

Methods

A formal invitation to participate in a focus group was sent to all students who participated in the scheme. The invite included a participant information sheet and consent

form. The study was ethically approved by the College of Science & Engineering Research Ethics Committee at the University of Derby. Four participants were able to take part in the focus group, three were female (two from level five and one from level six) and one male (level six).

The focus group took place over a sixty-minute period and was facilitated by someone unknown to the students. The questions for the focus group are listed below (**TABLE 1**). The questions were structured and aligned to themes drawn from the literature and of professional interest.

TABLE 1 *Questions asked in the focus group organized by theme.*

Theme	Question
Learning Experience	What are your overall impressions about the learning experience provided by the placement?
Forensic Science Attributes:	How did you feel about working with expert forensic scientist during your placement? Skills attained by students: Are there any particular skills you have developed during the placement?
Employability	How do you feel about your own future employment, having taken part in the scheme?
Cultural Experience	What were your feelings about taking part in an international placement/working in another country?
Organization	If you could give some advice to the organisers of next year's trip, what would you say?

The focus group was recorded (with permission) and used to create an interview transcript. The interview was thematically analyzed using the principles outlined by Braun and Clarke (15).

Results

Learning Experiences

The participants reported that visiting multiple departments was a fantastic opportunity that offered a variety of experiences akin to being immersed in a real forensic organization. They reported that the hands-on experiences surpassed any initial expectations they had by allowing them to be genuinely involved in a range of forensic cases. Several participants reported that the experience was not only invaluable but left a deep impression and in one case prompting the desire to return to the country. The significance of the opportunity was specifically noted against the challenge of finding a similar placement within the UK.

"…just having that hands on experience in like a real forensic environment is something I don't know if we could have got anywhere else."

"It was like I think having an experience with the police over here is one thing, but getting to see what they do in a like a different country and with that different culture was just it just sounded really exciting."

Forensic Science Attributes

There was clear recognition from all participants that they developed their communication skills. This was in part due to being in a foreign country with a different language and the necessity to develop these skills to make the most of the experience. It was also identified that it was the sustained period of interacting with professional forensic scientists about their practice. The whole placement experience boosted the participants confidence in their academic and professional skills and really emphasized the importance of teamwork and problem-solving abilities. One participant talked specifically about how the placement caused them to step out of their comfort zone and having to figure things out on the go while in an entirely new environment served as a significant catalyst for personal growth. All participants believed the significantly improved themselves during the placement period and undergone personal development and growth.

"I think they [problem solving & teamwork] were definitely improved from being there ... being out of my comfort zone definitely helped ... the development of those skills."

"I think what stood out for me were also the team working skills and or communication, also the sort of the analytical skills, because sometimes you are given tasks in the lab where we have to like work on it ourselves."

Employability

A strong theme from all participants was that they viewed the placement as vital in accumulating the experience and expertise in real-world settings that will be essential in their future career paths. The participants felt the forensic experts treated them not as students but as colleagues, the respect and responsibility of this dynamic empowered them in the placement. There was recognition that the exposure to live casework bolstered the participants confidence and cultural capital. In one very specific case the placement prompted a change in career direction (which has been realized now the student has graduated). The participants specifically notes that during the laboratory parts of the placement they were often tasked with independent work, which required them to develop charters and devise comprehensive plans. They felt this fostering critical thinking on a deeper level and led to a profound and practical understanding of the field.

"To see that you have gone for a placement somewhere so kind of far away that looks good in terms of your independence and pushing your own boundaries. So, I think it does increase your prospects when it comes to looking for a job."

"I think it definitely will have an influence on employment prospects because it's good to be able to put on your CV that you've had this hands-on forensic experience and I think to employers as well, to see that you've kind of gone for a placement somewhere so kind of far away that looks good in terms of your independence and pushing your own boundaries."

Cultural experience

The participants described a natural excitement about the opportunity to immerse themselves in a different culture and new experiences. Naturally, there were some concerns about communication most of this was beyond the workplace in casual settings like cafes or restaurants. To the surprise of some participants the placement facilitators showed genuine interest in spending social time with the participants, which they universally agree enhanced the experience. One participant talked about language barriers and to strengthen connections aspired to learn some Portuguese prior to the placement. There was strong agreement that although a similar opportunity in the UK would have been highly valuable, being in Brazil elevated the experience making it a valuable learning experience and a cultural exploration.

"The other [attraction] was culture, new experience, new culture, new food…"

"I think personally for me, if it had been in the UK it would have still been extremely valuable. But the fact it was in Brazil was took it just took it to another level for me."

Organization

The financial aspects of the trip were discussed extensively and weighed up by all participants prior to application. Several participants talked about the completive nature of the scheme and finding the anticipation of facing tough competition for a spot in the program quite daunting. On the placement, a reassurance came through in having a colleague to face these challenges together, a sense of security in numbers. There was a real sense of nerves about stepping into professional labs for the first time, those worries were quickly erased as the welcoming and supportive nature of the experts became evident. There were broader organizational concerns like the idea of being alone in accommodation and venturing out alone in unfamiliar environments for food. Health and safety were described as priority for all participants. To mitigate these concerns, they took responsibility for booking their own accommodations, aiming to stay relatively close to each other throughout the placement.

"There is a lot of factors that made me wonder about the finances of such a trip ... I think it was worth it but I don't know whether everyone would be in a position where they could do it."

"I think having [academic with them] by our side for those two weeks at the beginning really helped as we settled in."

Discussion and Conclusion

The individual benefits from the placement are articulated clearly in terms of how the students articulate both their exposure to real world skills, perceived development of general employability skills and experiencing a different cultural environment. This study did not explore individual student expectations of their placement, but it has been reported previously that they provide highly relevant educational experiences that are appreciated by students and live up to their expectations (16). The low number of participants make direct impacts on previously reported success in academic awards (13) as and employability prospects (14) difficult to ascertain. Students self-reported assessment of both was positive and one of the students has already secured a high-profile graduate level role.

It has been shown work-based learners benefit from participation in a learning group, which enhances their knowledge and is highly valued, suggesting that the design of work-based learning programs should integrate learning from both the workplace community of practice and the learning group (17). In this specific Turing placement, the students articulate the benefits of being together in a group, this is specific important to them in the 'grey' spaces around the formal placement like rest days and evening meals/entertainment. This is certainly a consideration to factor into future international placement opportunities.

When considering the strategic aims of the Turing Scheme to 'support social mobility and widening participation', we selected participants based on academic ability rather than any specific criteria. Despite the subsidy, this would still require financial capital notwithstanding the other significant barriers that international placements present (e.g., sole carer). Allen *et al.* (18) argue that work placements operate as a key domain in which inequalities within both higher education and the graduate labor market are (re)produced and sustained. Providers should carefully consider the wider mobility barriers and plan mitigations when providing opportunities like the Turing scheme. This objective is one that is noted has been less prominent in Higher Education websites related to the scheme, despite

the clear governmental emphasis on increasing the participation of disadvantaged groups (2).

Though in this study there was no evaluation of impact beyond the immediate benefits to participants, others have reported very few benefits to the wider university or any systematic change to practice because of international placement schemes (19). Global Britain and 'forging new relationships' appear to be understood in largely individualistic terms, with an emphasis on the benefits to individuals rather than to wider communities, nations, or 'global society' (2). A possible way to spread the benefit to a wider range of students would be to limit the selection of students to second years (level 5) as these students would return to the university for a final year and share the experience and lessons with their peers. This was instigated in the second iteration of this scheme.

Though no direct link to employability can be established in this specific case because of the small size of the group studied and the timing of the focus group, it is clear that the students perceived that the experience equipped them with subject-specific skills and the more general employability skills that will be of value in their future careers and future life experiences.

Aside from the challenge of providing sufficient placement opportunities to meet student demand, ensuring that the experiences provided are of high quality is also important and requires significant attention. The need for significant time investment by university academics, professional service staff and other service providers to ensure a high-quality experience is significant (20, 21). In this specific placement an academic was required to travel to Brazil and accompanied the students for a substantive part of their placement. While on the placement, students were accompanied daily by the forensic experts who closely supervised their activities. It is clear that all the time and effort invested, the academics cultural and social capital (Brazilian national) and the student's fluency in Portuguese were key factors in the success of this placement.

In conclusion, this study provided insight into the perspectives of a group of forensic science students on their impact their participation in an international placement through the Turing Scheme in Brazil had on their employability skills. The findings were consistent with the existing literature for work-based learning and international placements experiences evincing the benefits of the practice to enhance graduates' profiles and work readiness of students.

Overall, the international placement in Brazil through Turing Scheme provided students with a valuable experience where students developed not only key forensic science skills but also soft transferable skills. The possibility to work with real cases fostered critical thinking and boosted participants` confidence in their professional skills culminating in a life changing experience.

Despite being time consuming and required intensive dedication from the lecture organizing it and the forensic experts involved, the activity proved to have significant educational benefits for students who participated and enriched the undergraduate profile.

The findings of this study support for study in international placements as potential high impact practice for undergraduate students that enhance both their personal and professional skills.

References

1. Gov.uk (2018). https://www.gov.uk/government/collections/global-britain-delivering-on-our-international-ambition#:~:text=Global%20Britain%20is%20about%20reinvesting,confident%20on%20the%20world%20stage.
2. Brooks R, Waters J. An analysis of the UK's Turing Scheme as a response to socio-economic and geo-political challenges. High Educ 2023Jan;19:1-9.
3. Waters JL. Time well spent? Temporal dimensions of study abroad and implications for student experiences and outcomes under the UK Turing Scheme. BERJ 2023 Apr;49(2):314-28.
4. Billett S. Curriculum and pedagogic bases for effectively integrating practice-based experiences. Sydney: ALTC 2011.
5. Davies K, Curtin M, Robson K. Impact of an international workplace learning placement on personal and professional development. Aust Occup Ther J 2017 Apr;64(2):121-8.
6. Thomas Y, Penman M, Williamson P. Australian and New Zealand fieldwork: Charting the territory for future practice. Aust Occup Ther J 2005;52:78-81..
7. McGuinness S, Whelan A, Bergin A. Is there a role for higher education institutions in improving the quality of first employment?. BEJEAP 2016 Oct 1;16(4):20160174.
8. Taylor J. Toward a strategy for internationalisation: Lessons and practice from four universities. J Stud Int Educ 2004 Jun;8(2):149-71.
9. Slantcheva-Durst S, Danowski J. Effects of short-term international study trips on graduate students in higher education. J Stud Aff Res Pract 2018 Apr 3;55(2):210-24.
10. Bretag T, van der Veen R. 'Pushing the boundaries': Participant motivation and self-reported benefits of short-term international study tours. IETI. 2017 May 4;54(3):175-83.

11. Gomez-Lanier L. The experiential learning impact of international and domestic study tours: Class excursions that are more than field trips. IJTLHE 2017;29(1):129-44.
12. Crawford I, Wang Z. The impact of placements on the academic performance of UK and international students in higher education. Stud High Educ 2016 Apr 2;41(4):712-33.
13. Standley HJ. International mobility placements enable students and staff in Higher Education to enhance transversal and employability-related skills. FEMS Microbiol Lett 2015 Oct 1;362(19):fnv157.
14. Silva P, Lopes B, Costa M, Seabra D, Melo AI, Brito E, Dias GP. Stairway to employment? Internships in higher education. High Educ 2016 Dec;72:703-21.
15. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol 2006 Jan 1;3(2):77-101.
16. Južnič P, Pymm B. Students on placement: a comparative study. New Libr World 2011 May 17;112(5/6):248-60.
17. Siebert S, Mills V, Tuff C. Pedagogy of work-based learning: the role of the learning group. J Workplace Learn 2009 Aug 7;21(6):443-54.
18. Allen K, Quinn J, Hollingworth S, Rose A. Becoming employable students and 'ideal' creative workers: exclusion and inequality in higher education work placements. Br J Sociol 2013 May 1;34(3):431-52.
19. Zhang X, McInerney J, Frechtling J. Effect of STEM faculty engagement in the math and science partnership program. Sch Sci Math 2011 Oct;111(6):274-87.
20. Rodger S, Fitzgerald C, Davila W, Millar F, Allison H. What makes a quality occupational therapy practice placement? Students' and practice educators' perspectives. Aust Occup Ther J 2011 Jun;58(3):195-202.
21. Liyanage L, Strachan R, Penlington R, Casselden B. Design of educational systems for work-based learning (WBL): the learner experience. High Educ Ski 2013 Feb 15;3(1):51-61.