

APPRENTICESHIP MOBILITY IN EUROPE

Dominique Deneux¹, Christian Goetz², Klaus Homann², Markku Leino³, Lisa Raab², Jorma Säteri³ and Robin Westacott⁴

¹INSA-Hauts-de-France, Valenciennes, France; ² Duale Hochschule Baden-Württemberg, Stuttgart, Germany; ³ Metropolia Ammattikorkeakoulu Oy, Helsinki, Finland, ⁴Heriot-Watt University, Edinburgh

Abstract: InT#Tech was an ERASMUS+ Strategic Partnership project investigating the internationalisation of apprenticeship or Cooperative programmes. Four universities (INSA (France), Duale Hochschule Baden Württemberg (Germany), Metropolia (Finland) and Heriot-Watt University (United Kingdom)) offering apprenticeship-like programmes worked to understand the route to international experience for apprentices during their programme. Part of this project involved the comparison of delivery models to identify commonality that the partners can use to facilitate exchange. In order to test the efficacy of exchange a Summer School was organised in Edinburgh during the Spring of 2019 for a limited number of apprentices from each of the four partner universities. The Summer School comprised expert lectures on subjects relevant to the areas of study and work of the apprentices. This Summer School was the pilot run for an International Module designed to run over an extended period in 2020. The plans for this were curtailed because of COVID and eventually a compromise programme was required, and this was delivered between March and June 2021. This paper will identify the challenges uncovered as part of this work and recommendations for other providers who want to design an international element to their apprenticeship programmes.

Keywords; Graduate Apprenticeships, mobility, international, engineering education, international.

**Correspondence to: R.E. Westacott, Office of the Principal, Heriot-Watt University, Edinburgh.
E-mail: r.e.westacott@hw.ac.uk*

1. INTRODUCTION

In the UK internationalisation within higher education has important implications for funding, teaching, research and recruitment (Al-Mahdawi, 2022). While there are significant benefits, there are also barriers and risks (Jibeen and Khan, 2015). In a globally connected world, it is not surprising that efforts to promote the values of international student exchange have grown substantially over the last couple of decades. International and intercultural exposure and experience are commonly provided through study abroad courses, which may be through collaboration between universities or ad hoc. At Heriot-Watt University, we have the Go Global opportunity between our international campuses. The impact of study abroad on student development is well-documented and includes personal development (for example, Van Hoof and Verbeeten, 2005), cultural awareness (for example, Dedee and Stewart, 2003), academic

development (for example, Luo and Jamieson-Drake, 2015), and enhanced career success (for example, Kratz and Netz, 2016), amongst others.

One of the interests in work-based learning programmes that arose from delivering Graduate Apprenticeships was the parallels between Graduate Apprenticeship programmes and the more traditional university degree programmes. One of these parallels is international experience, which is relatively common in traditional degree programmes, but options for apprentices are limited. In some European countries practical training abroad is growing in popularity as employers look for evidence of (future) employees' intercultural awareness and skills for the global economy.

Graduate Apprenticeships are work-based learning programmes leading to university degrees, initially to Bachelor's level or SCQF level 10 (Skills Development Scotland, 2016). Graduate Apprenticeships were introduced in Scotland in 2017, with the first three subjects being Engineering: Design and Manufacture, IT Management for Business and IT Software Development for Business. This has now grown to include a much wider range of subjects including Accountancy, Business Management, Construction, Data Science, and Early Learning and Childcare. Heriot-Watt University has delivered Graduate Apprenticeships since 2017.

Opportunities for apprentices to participate in international exchange or mobility programmes are much more limited and the barriers to creating opportunities for apprentices are very different to those for traditional campus-based students. The latter are more likely to take advantage of study abroad programmes and also "internationalisation at home" where students from another country join their local cohort (Soria and Troisi, 2014). For apprentices, "internationalisation at home" could happen in the workplace depending on the nature of their employer, but may be less likely to happen in the university setting because of how apprenticeships are funded.

The InT#Tech project was funded by ERASMUS+ to investigate the practicalities of international mobility within Europe for Bachelor degree level apprentices. Four universities (INSA-Hauts-de-France, DHBW Stuttgart, Metropolia and Heriot-Watt University) set out to investigate and develop opportunities for international exchange and cooperation amongst their apprentices. The project was set out in several phases:

- Comparing the systems (national and local) for delivery of apprenticeship programmes
- Preparation and collection of learning and teaching materials for the international module
- Development of module descriptor for information and quality purposes
- Delivery of the International Module
- Recommendations for stakeholders on international mobility for apprentices

Throughout this paper the term "apprenticeship" will be used to mean the same as "Cooperative" and "Dual", in the sense that programmes of these types integrate work and study.

2. CONSIDERATIONS FOR APPRENTICE MOBILITY

In considering the benefits of international mobility for apprentices, the benefits for all stakeholders need to be considered. Thus, it is not just the cost/benefit analysis for the university and the apprentices, the viewpoints of employers also need to be included. Ideally, study abroad

opportunities for apprentices would parallel those for traditional on-campus students, where a term, semester or academic year is commonly used as the period of mobility. Depending where in the world the student is going, the barriers are often related to the construction of the academic year in the receiving university and how this compares to the “home” university – when in the calendar year the academic year starts and the learning periods (terms, semesters, etc.) within the academic year. By choosing university partners with similar academic cycles, study abroad partnerships can relatively easily be set up for traditional undergraduates. However, this is not the only barrier for apprentices and the issue becomes complicated not only by the desire of individual apprentices to be involved and obtaining the permission of their employer, but the availability of individual apprentices is dictated by a balance between the needs of the workplace at a particular point in time and the flexibility of an employer, and these can be different for each apprentice.

The four InT#Tech partners compared the structures of the academic calendars for the four universities with the added complexity that there are practice (in the workplace) and theory (off-the-job training) to consider. In some cases, it was impossible to consider travel of apprentices because of the impact on the practice phase of their programme. Across the four universities the approaches to the academic year were very wide-ranged and included traditional semesters, alternating blocks of theory and practice, and split weeks (part of the week in the university and the other part in the workplace); even in the latter case there was variation between the two universities who used this pattern: 50:50 and 20:80. When coupled with the academic calendar, including university, regional and national holidays, and exam periods, it was impossible to find a period when apprentices from all four universities would be available for an extended period without it being detrimental to one or more groups, and so a more blended approach was taken.

Thus, the challenge became about creating a meaningful experience for apprentices while maximising international collaboration and experience amongst the apprentices of the four universities. Three periods of the year in Spring were identified as having opportunity for international collaboration amongst a large group, and these were used to devise a timetable of mobility and activity referred to as the “International Module”.

3. THE INTERNATIONAL MODULE

To develop the international module the partners considered content, method of delivery and the development and use of soft skills. To do this the four partners considered the full life cycle of the module from induction to assessment and completion. The goal was to create a module that can be used standalone, but that could also be incorporated into existing degree programmes. As a first step in order to understand the interest of apprentices in the concept and to understand the logistics of creating an event or series of events for apprentices from four different countries in four different systems, the “InT#Tech International Summer School” was devised. This was hosted by Heriot-Watt University at the Edinburgh campus during a week in May 2019. By careful consideration of the constraints imposed by the four systems and to reduce the impact on local resource the exact week was chosen based on the end date of the local semester. This meant that accommodation on campus was available and that a wide range of teaching and other facilities were easy to reserve.

The summer school was designed such that five students from each university would attend, which gives a total of twenty students; five of them would be “home students”, so they would not need to travel. The idea was to provide the students with a week during which they could meet students from the other three universities, learn in the context of innovative engineering, work in international groups to develop a business idea based on an innovative product and present that to a team of assessors, and do some cultural visits to learn about the host country.

The teaching and learning activities were distributed amongst the partners. Each partner was responsible for one lecture. They either did it themselves (France, Germany) or found an interesting speaker who gave a lecture (Finland, Scotland). One of the lectures (the Finnish lecture) was actually given via Skype and was at that time (before the pandemic) a new experience for many of the students. Two cultural visits were planned and the rest of the week was reserved for project work where the students had to work in international groups on a current problem in the modern world and make a business idea out of it. This business idea had to be presented as a “pitch”, and the best group was chosen by the project leads from each of the four university partners. The mixed groupings for students for this exercise was an attempt to ensure that students from the same country couldn't naturally create their own groups (Waters and Yeung, 2013).

The learnings from the International Summer School were applied to planning the International Module. One of the outcomes was the understanding that it was a less attractive for the students of the host university because there was no travel for them. Based on the learnings from the comparison of the four partners' programmes, it was decided that while the actual physical mobility periods could only be one week, the period of collaboration of the students needed to be longer in order to meet requirements of modules in terms of ECTS credits and learning hours.

A blended learning module was designed involving two periods of mobility over four phases of activity: study by the students prior to the period of mobility, the mobility week, project work by the students after the initial mobility week and a final period of mobility (with Brussels identified as the venue) to present the results of the projects. All mobility for all apprentices was funded by ERASMUS+. It was decided that the best period for delivery of the module was between April and June 2020. To allow all students to travel, two host universities were identified, where all students from one host travelled to the other host, and vice versa; while half the students from the other two universities attended each of the hosts. At the beginning of 2020 the recruitment of apprentices started, an information document created to ensure that the students and their employers understood the commitment, and logistics for travel and accommodation began.

At the start of the global COVID-19 pandemic in March 2020 and during the lockdowns and travel restrictions that ensued, delivery of the International Module was postponed as there was insufficient time to create an alternative activity for delivery in the time available. On-going discussion about the International Module during the period of the pandemic assumed that at some point a face-to-face activity would be possible. With different timelines and rules for the pandemic in different countries, it became apparent that this could not happen within the funding period, a virtual module was created that included simple laboratories that could be done remotely and the funding period extended by 1 year. So, the reaction to COVID meant that there was no travel by anyone to participate in the International Module and all activities were modified so that they could be carried out online.

This approach also effectively shared the teaching and laboratory load across the four partners rather than concentrating it on a physical venue. It also made it easier to compartmentalise the module to create four stages: introduction, “mobility week”, student work, and finisher workshop, without having to travel multiple times. The advantage that can be taken from this approach is that hybrids of face-to-face and virtual events can be created in the future to accommodate issues arising from timings, travel restrictions, availability of apprentices and finance. Effectively, this meant that the International Module could become a blend of mobility and Collaborative Online International Learning (COIL). The concept of the module is provided in Figure 1, where originally all phases except “Student Work” would have involved travel and the number of hours is the time commitment required of each student in that period.

INTRODUCTION	MOBILITY WEEK	STUDENT WORK	FINISHER WORKSHOP
Event: 19/4/21 to 16/5/21 Kick-off Meeting (30 hours)	Event: 17/5/21 to 21/5/21 (40 hours)	Event: 24/5/21 to 15/6/21 (25 to 35 hours per student)	Event: 16/6/21 to 20/6/21 (40 hours)
Venue: MS Teams	Venue: MS Teams	Venue: MS Teams	Venue: MS Teams and Engage VR Platform
Activities: All participants create Padlet to introduce themselves.	Activities: International lectures	Activities: Student groups progress agreed project in international groups.	Activities: Project pitches
Create international teams.	Remote and virtual laboratories	Experience international working through COIL.	Virtual cultural visits
Followed by group work until the mobility week.	Groups develop project ideas		Module outcomes and results

Figure 1. The four stages of the International Module.

In the Kick-Off-Meeting, which was held online using Microsoft Teams, all students and all academics participated. All participants used a Padlet to introduce themselves (e.g. [Robin Westacott \(padlet.com\)](https://padlet.com/RobinWestacott)). Following this the international student groups for the “Student Work” phase were organised. The groups were pre-determined by the organisers to ensure that one student from each university was in each group; this was especially important to prevent the easier option of each university forming a group. Between the Kick-off Meeting and the Mobility Week, the international student groups worked to generate an idea for a startup enterprise and each team member adopted a role within the enterprise (e.g. financial manager, technical manager etc.) and

made a short movie to be presented during the mobility week. In addition, the students were provided with teaching material in preparation for the lectures and labs in the mobility week.

The mobility week was organised such that each university partner provided the lectures and labs for one day each. The fifth day was reserved for cultural events – in this case a virtual guided tour through a electro-motorcycle company in Germany and a technology park located next to the university of Valenciennes in France were used. The timetable for the mobility week is shown in figure 2. In the original plan this week would have been the sole responsibility of a host university, but the conversion to virtual allowed the workload to be more evenly shared among the partners. The downside of this was that physical laboratories needed to be replaced by simulations or simple experiments that could easily be sent to the students.






<p>Monday</p>  <p>Welcome (Dominique Deneux)</p> <p>Quiz on preparation material</p> <p>Lecture: Big Data and Machine Learning</p> <p>Lunch</p> <p>Laboratory: Remote Diagnosis: real-time analysis of machine data</p>	<p>Tuesday</p>  <p>Welcome (Christian Gotz)</p> <p>Lecture: Fuel Cells</p> <p>Industry Insight: Methanol Fuel Cell</p> <p>Lunch</p> <p>Laboratory: Fuel Cells</p>	<p>Wednesday</p>  <p>Mobility Start-Up SOL Motors GmbH</p> <p>Workshop: Pitch Deck</p> <p>Lunch</p> <p>Virtual Visit Transalley in Valenciennes</p> <p>Information Session Finisher Workshop</p>	<p>Thursday</p>  <p>Welcome (Robin Westacott)</p> <p>Lecture: Renewable Energy – an Engineer’s Perspective</p> <p>Lunch</p> <p>Laboratory: Renewable Energy Load Balancing Simulation</p>	<p>Friday</p>  <p>Welcome (Jorma Sateri)</p> <p>Lecture: Autonomous Public Transport</p> <p>Lunch</p> <p>Laboratory: Production Line 3D model simulation</p>
---	---	--	---	--

Figure 2. Timetable for the Mobility Week

For the four weeks between the mobility week and the finisher workshop the students engaged in further development of their projects and wrote the lab reports from the mobility week.

The final stage of the module was the Finisher workshop. There were two options for the delivery of this stage: face-to-face and virtual. The first option remained a possibility right up until it became impossible due to cost and travel restrictions, with the intended venue being Brussels. In

order to give the participants a different and enhanced experience, the virtual world software ENGAGE was used for the majority of the activities in the Finisher workshop, where the participants could meet as avatars in a virtual world. A screenshot of one of the student groups presenting their work is shown in Figure 3. During this finisher workshop, the students presented the plans for their startup companies. Additionally, there were some presentations and time for virtual reality cultural visits: virtual tours through the EU parliament and through the cities of the four university partners (Stuttgart, Valenciennes, Edinburgh, Helsinki). The rest of the time was reserved for the students to finish their remaining tasks.



Figure 3 A student group presenting their work in the Engage VR platform

4. Evaluation and Recommendations

In general, the international module was seen as very successful. Most students enjoyed it very much. The way it was held (purely online) was the best way it could be done under the circumstances within the funding period. All participants would have preferred the face-to-face version with travel. As it turned out, the creation of multi-national project groups which was originally planned to stop the predictable formation of single nation groups, became the international experience for the apprentices who experienced the full international module.

Many saw the disadvantages of online lectures: the interaction between the participants is limited. The chance to meet each other outside the lectures and make friendships was very much reduced, and limited virtually in the initial stages by the students needing to work in their teams with limited interaction between teams. The ENGAGE environment improved this it enabled person-to-person interactions without the need for organised break-out rooms or separate meeting rooms, but it could not replace a real face-to-face meeting. Sitting for whole days in front of a computer screen is much more fatiguing than sitting in classrooms and other locations.

On the other hand, use of digital technology allowed inclusion of lectures by experts without their need to travel (from Dubai for example) or visiting (virtually) two companies in two different countries on the same day. In the future, these positive aspects should be kept and can be an additional element even if face-to-face is the preferred model. The students' motivation was high during all stages of the international module. The concept of the international module with four stages was quite successful. The technical content of the summer school should not be too broad, so that students profit from all parts of the school. The same holds for the international module.

Given that apprentices from all four countries are fundamentally different to traditional students, and many have greater responsibilities in their personal life, it may be possible to have two versions of this approach to an International Module: the original version with travel for those who can travel and a virtual version for those who can't.

2. REFERENCES

Al-Mahdawi, E. 2022. An Overview on Internationalisation within the United Kingdom Higher Education. *International Journal of Management and Humanities*, 8, 7-11

Dedee, L.S. and Stewart, S., 2003. The Effect of Student Participation in International Study. *Journal of Professional Nursing*, 19, 237-42.

Jibeen, T. and Khan, M.A. 2015. Internationalization of Higher Education: Potential Benefits and Costs. *International Journal of Evaluation and Research in Education*. 4, 196-199

Kratz, F. and Netz, N. 2018. Which Mechanisms Explain Monetary Returns to International Student Mobility? *Studies in Higher Education*. 43, 375-400.

Luo, J. and Jamieson-Drake, D. 2015. Predictors of Study Abroad Intent, Participation, and College Outcomes. *Research in Higher Education*, 56, 29-56.

Skills Development Scotland, 2016. Graduate Level Apprenticeships, SCQF level 10 Product Specification, Skills Development Scotland, Glasgow

Url: https://www.skillsdevelopmentscotland.co.uk/media/42495/gla_product_spec_level_10.pdf

Soria, K. and Troisi, J. 2014. Internationalization at home alternatives to study abroad: Implications for students' development of global, international, and intercultural competencies. *Journal of Studies in International Education*, 18, 261-280

Van Hoof, H.B. and Verbeeten, M.J. 2005. Wine Is for Drinking, Water Is for Washing: Student Opinions About International Exchange Programs. *Journal of Studies in International Education*, 9, 42-61.

Waters, J. and Leung, M. 2013. A colourful university life? Transnational higher education and the spatial dimensions of institutional social capital in Hong Kong. *Population, Space and Place*, 19, 155-167