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An Insurmountable Gap: Can We Balance Incoming and Outgoing Erasmus Exchanges Among Engineering Students?

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Abstract

Because of the global power of English and being situated in an English-speaking country, Irish higher education institutions do not have to try very hard to attract Erasmus students from across Europe. However, persuading Irish students, particularly students of engineering, to undertake an Erasmus exchange in another European country is a much more difficult process. This paper outlines the recent history of Erasmus exchanges of engineering students to and from the Dublin Institute of Technology and examines the push and pull factors that affect these exchanges. It presents the results of a small-scale research project into the factors that encourage or discourage engineering students and the benefits that students perceive they derive from undertaking Erasmus exchanges and the limitations they face.

Keywords: Erasmus exchanges, engineering students, push and pull factors

Introduction

It has long been held that the education of engineers requires an international dimension (Simpson 1994, Jensen & Johannesson 1995, Tubman et al 1998, Irandoust 2000, Gerhardt & Smith 2008) in order that engineering graduates have the necessary attributes and skill sets to compete in a global economy. One important aspect of international education is that students have the opportunity to study for short periods abroad to prepare them “to meet the increasing demands for international job qualifications, professional as well as linguistic, cultural [and] social.” (Jensen & Johannesson 1995, p. 19) In the European context this has been provided by the Erasmus programme, the European Union’s most successful educational initiative ever. However, the number of engineering students taking part in Erasmus exchanges has been proportionately less than for many other disciplines and in the Dublin Institute of Technology (DIT) this is very much the case.

This paper will examine the background and history of the Erasmus programme as it relates to engineering students, focusing in particular on DIT. It will show the results of a small-scale survey of incoming and potential outgoing Erasmus students and explore the factors that have affected their decisions to undertake Erasmus mobility or not. It will highlight the reasons why DIT is more successful at attracting foreign engineering students into the institution than DIT students to go abroad and suggest how more DIT engineering students can be encouraged to take up the opportunity for Erasmus mobility and increase their international focus.

Background

From its inception in 1987 the Erasmus programme’s main goal has been to encourage student mobility, with a recent target having been to reach 3 million student exchanges before 2013. The latest programme, called Erasmus+, is more ambitious still and plans to add a further two million student exchanges by 2020, so that 20% of the higher education student population will complete

a study or training period abroad. Why? Because, according to the European Commission (2015b): “Going abroad to study or train helps people develop their professional, social and intercultural skills and increase their employability.”

These goals are surely as desirable for engineering students as for those of all other disciplines, yet the number of engineering students from DIT, and from Irish higher education institutions in general, who have undertaken an Erasmus study period in a European partner institution, has been very small. At a time when Erasmus student numbers across almost all subject areas and institutions have been on the rise – from 1,708 outgoing Erasmus students in 2001-02 to 1,983 in 2011-12 (HEA 2015) – engineering student mobility numbers have not been impressive. Table 1 shows the number of engineering students going to European partner institutions from Irish universities, Institutes of Technology (IoTs) and DIT over four recent years.

Table 1. Number of outgoing engineering students from Irish higher education institutions

Institution type	2007-08	2008-09	2009-10 Not available	2010-11	2011-12	Total per institution type
Universities (7)	11	7		19	4	41
DIT	11	2		1	3	17
Other IoTs (13)	6	2		5	19	32
Total outgoing engineering students per year	28	11		25	26	

Source: HEA (2015)

For those same four years, while outgoing student numbers across all disciplines in DIT exhibited fluctuations but were generally strong, only 17 students or 2.5% of the total were from the engineering and technology area (see Table 2).

On the other hand, no such problem exists in attracting European students into Ireland and DIT. The most recent statistics from the European Commission (2015a) show that Ireland attracts almost two and a third times as many Erasmus students as it can send out, with the bulk of the students coming from the traditional exchange partner countries of France, Germany, Spain and Italy. As Table 3 (below) shows, the most popular countries for Irish students, in order of popularity, are France, Spain, the UK and Germany. The inclusion of the UK highlights one of the key areas of difficulty in attracting Irish students to go abroad – the generally weak foreign language skills of Irish students and the reluctance of many to travel for an extended period of study to a country where they do not master the language. This is a perfectly logical choice for students who want to graduate without added complications but does little to expand their international experience and intercultural competence.

Table 2. Outgoing DIT Erasmus students according to subject area

Subject area	2007-08	2008-09	2009-10 Not available	2010-11	2011-12	Total per subject area	% of total
Architecture, urban and regional planning	1	8		7	7	23	3.3%
Creative arts	11	23		32	16	82	12%
Business studies and management	74	90		59	53	276	41%
Engineering and technology	11	2		1	3	17	2.5%
Languages				51	53	104	15%
Medical sciences	16	14				30	4.4%
General sciences	1	4		32	13	50	7.3%
Journalism, communications and marketing	16	18		11	13	58	8.5%
Other areas of study		1		20	20	41	
Total number of students	130	160		213	178	681	

Source: HEA (2015)

Table 3. Erasmus student mobility into and out of Ireland 2012-13

Partner country	Incoming	Percentage of total	Outgoing	Percentage of total
Total	6277		2762	
France	1909	30%	589	21%
Germany	1181	19%	329	12%
Spain	967	15%	493	18%
Italy	414	7%	65	2.4%
Netherlands	238	4%	173	6%
UK	194	3%	454	16%
Belgium	190	3%	106	3.8%
Austria	174	2.8%	65	2.4%
Poland	125	2%	25	0.9%
Czech Republic	101	1.6%	49	1.8%
Sweden	97	1.5%	116	4%
Others	687		298	

Source: European Commission (2015a)

Incoming engineering students – what attracts them to DIT?

Between 2008 and 2012 I was the Erasmus coordinator for the then School of Civil and Building Services Engineering in DIT. During that period incoming student numbers increased so that, in my final year in the role, 18 students came for either one or two semesters from institutions in France, Germany, Spain and Switzerland. In the same academic year only 3 engineering students went from DIT across all engineering disciplines (see Table 2 above). This was the catalyst for me to question why we attract more students than we send out and to ask students themselves what their motivations and experiences were. In 2011 I contacted 22 former and 12 current incoming Erasmus students to complete an anonymous questionnaire and got nine responses. In January 2015 I contacted a further 15 current students and received two responses. For the purposes of this analysis I have combined all responses received over the two periods.

The survey respondents came from France (6), Spain (4) and Switzerland (1). Only one was in the 2nd year of studies, four were in their 3rd year, three in 4th year and three in 5th (final) year. The majority spent two semesters at DIT (7) and their engineering disciplines were: civil/structural (8), mechanical/product design (1), industrial/automation (1) and transport (1). Only six of the students intended or were required to achieve 30 ECTS per semester – I am aware that, in general, students from French engineering institutions are usually required to do the full complement of credits per semester (30) while institutions in Germany, Spain and Switzerland, for example, are more flexible and often do not demand the full 30 credits. Eight students took credits (5 or 10 ECTS) in non-engineering modules such as English for Academic Purposes or Irish Cultural Studies.

When it came to giving their multiple reasons for wanting to do an Erasmus exchange 9 students stated that one reason was to improve their English, 6 of them wanted new experiences, 3 wanted to meet new people. Only one each mentioned that international experience or their professional life was a consideration or that the study programme on offer in DIT was a good match. Why they chose DIT was mainly because it was an existing partner institution (5), English-speaking (4) or had a good reputation (2), while 6 students chose it to discover Dublin and Ireland.

It appears that the institutions these respondents came from do not promote Erasmus exchanges very intensively although 6 students thought that their institution saw Erasmus as important. Very few anticipated problems on their return to their home institutions although 2 students were worried about their learning agreements or having their credits accepted without difficulty. The main benefits they foresaw from their Erasmus mobility were improvements in their level of English language competence (9) and better job prospects (3). What they enjoyed most about their stay was making new friends (7), life in Dublin (3), travelling (3) learning about another culture (2) and the study programme (2). Personal development and Guinness also got a mention here. The negative aspects of the Erasmus mobility related to prices and cost (4), missing family and friends (2) as well as becoming familiar with a new culture and study programme, and the weather.

Students were asked to evaluate the usefulness of their Erasmus experience for their personal, academic and pre-professional development and most thought that its main benefit was for personal development (7) although the remainder stated that it was beneficial across other areas. Only one student said that this Erasmus exchange had not helped their intercultural understanding, because of not being able to find other Erasmus students. Finally, a number of respondents were unsure as to whether their Erasmus experience would affect their future career or professional life (7) with some thinking that it was too early to tell. Only 3 students thought it would help to develop their international career while another said that it had helped to improve their understanding of engineering.

The experience of these students mirrors in many aspects the findings from a number of studies on the effects of Erasmus mobility on students and their career prospects (Maiworm & Teichler 1996, Teichler 2012). The main benefit appears to be linguistic, while meeting new people, living abroad and having new experiences have helped with personal development. The idea that Erasmus mobility does not necessarily improve international employability is not what the European Commission had in mind by funding the Erasmus programme (2015b) but it bears out Teichler's conclusion that increased Erasmus mobility removes the "exceptionality of temporary study abroad" (2012, p. 11). Nonetheless, increased foreign language competence and personal development are worthwhile goals of any study programme.

DIT engineering students and the Erasmus programme

As figures above have shown (see Table 2) temporary study abroad is still exceptional among DIT engineering students, although in the current year 11 students are scheduled to undertake an Erasmus mobility, ten of them for one semester and one for the full year. The disciplines involved are electrical/electronic (6), mechanical and design (3) and transport engineering (2) and the destination countries are Germany (6), Spain (3), Finland (1) and Slovakia (1). At the same time, 6 mechanical and design engineering students are headed for the USA and Switzerland (no longer an Erasmus programme country) so outward mobility numbers appear to be growing overall.

In 2011, when only three engineering students left DIT on Erasmus exchanges I conducted a survey of 2nd year students to get some insight into why there was such a poor uptake of Erasmus opportunities. The survey received 37 responses. I administered the same survey to a group of students in January 2015 and received 39 responses. In 2011 the students were from the following disciplines: mechanical (17), civil/structural (5), building services (2), manufacturing (2) and unspecified (11). In 2015 the disciplines were: mechanical (26), manufacturing (7) and building services (6). Most students first heard of Erasmus in their 1st year in DIT (2011 = 24, 2015 = 20). Others heard about it from friends, siblings, in secondary school or earlier in their 2nd year of college. One student in 2015 had never heard of Erasmus but it should be noted that there has been a large increase in international students (from the Middle East, China, etc.) since 2011 and this may be reflected in student awareness of the Erasmus programme.

In 2011 only 23 students out of 37 had considered going on an Erasmus exchange, in 2015 this had grown to 31 out of 39, with 2 more students saying “maybe”. The most popular countries chosen by potential Erasmus students in 2011 were France (8), Germany (4), Denmark (3), the UK (2) and Sweden (2). However, a surprising number also selected the USA (10), Canada (4) and Australia (2). Among those who said they would not consider Erasmus, the countries that attracted them were again mainly English-speaking: US (4), Canada (1), “English-speaking countries” (2). By 2015 Germany (14) had become the most popular European destination for potential Erasmus applicants, followed by France (10), the UK (7), Netherlands (3) and Italy (3) but, again, English-speaking countries featured strongly in stated choices: USA (16), Australia (6) and Canada (3). Students were allowed to include as many countries as they liked but 7 mentioned only one country: the USA. A range of other countries were mentioned, including Turkey, Romania, Czech Republic, Iceland, China and India. It is obvious that among this group of mixed nationality students many have really no idea what countries are involved in the Erasmus programme. The wish to take up a student mobility only through English or another language they already know is strong for many potential applicants in this group.

This becomes clearer when responses are analysed to the questions: “Do you speak any foreign languages? If so, to what level?” While a majority of the 2015 cohort speaks French (17), they admit to a very low level of competence. The second most commonly spoken language is German (6), but again to a low level, while the students who speak Polish (2), Lithuanian (1), Russian (1), Romanian (1), Chinese (1) and Turkish (1) have native or very high levels of competence. Seven students who would consider an Erasmus exchange have no foreign languages at all but would want to go to the USA or other English-speaking countries. Among the 2011 cohort the majority language is again French (10), followed by German (5) and Spanish (1), with the only other language mentioned being Yoruba (1).

The DIT students who might potentially go on an Erasmus exchange have very similar reasons to the incoming students discussed earlier. The main attractions of Erasmus are: having new experiences (2011 = 9, 2015 = 12), encountering a different culture (2011 = 5, 2015 = 12), having a new learning or study experience (2011 = 2, 2015 = 19), meeting new people (2011 = 2, 2015 = 5), travel and adventure (2011 = 3, 2015 = 7). One 2015 student would go to get away from family while one 2011 student would be attracted to Amsterdam for the “sunny weather”.

Of the students who would not consider Erasmus mobility, “nothing” would attract 4 of the 2011 group while others could potentially be enticed abroad to see different cultures (3), improve their CV (2) or, again, by the weather (1). Among the “no” respondents in 2015 only experience (2) or weather (1) would attract them.

When it comes to the duration that students would like to stay abroad most of those who would consider going would stay for only a semester up to 6 months (2011 = 13, 2015 = 25), the remainder (2011 = 11, 2015 = 6) would

stay from 6 months up to a full year. As was seen earlier, this also reflects the wish of the majority of this year's outgoing students to stay abroad for the shortest possible period of mobility.

Students were asked what factors had affected their decision not to apply for an Erasmus exchange so far. For both groups the overwhelming factors were "worry about costs, etc." (2011 = 13, 2015 = 25), "not enough foreign language skills" (2011 = 14, 2015 = 18) and "not enough information given about Erasmus" (2011 = 10, 2015 = 17). Other factors of importance were: "afraid foreign programme would be too different" (2011 = 8, 2015 = 13) and "afraid foreign programme would be too hard" (2011 = 6, 2015 = 6). For the 2015 group "not enough time in study programme" was also a factor for 10 students.

So, what, they were asked, would help students to confirm their choice to go on an Erasmus mobility? For the 2011 group more funding (14), Erasmus exchanges being built into their programme of study (13), the chance to go to an English-speaking country (12), more information about Erasmus (10), more opportunities to go at different stages of the degree programme (7) and preparatory foreign language classes offered at DIT (7) would influence their decision. The 2015 group shows very similar responses: more funding (25), the chance to go to an English-speaking country (21), more information about Erasmus (21), Erasmus exchanges being built into their programme of study (16), more opportunities to go at different stages of the degree programme (12) and preparatory foreign language classes offered at DIT (9). The students who said they had never considered going on an Erasmus exchange also pointed to funding, information, the opportunity to go to an English-speaking country, and building Erasmus into their study programme as factors that might affect their decision to apply for a mobility place.

Tipping the balance? – A preliminary analysis

The gap between incoming and outgoing Erasmus students in Irish higher education has always been large. Clearly, the attraction lies for many incoming students in the possibility to improve their English language skills and many are prepared to stay for the full academic year in order to get the maximum benefits of this aspect. This is equally true for incoming engineering students and, certainly until recently, this has meant that the number of engineering students coming to DIT on Erasmus mobility has been many multiples of those going out to partner institutions across Europe. So, while it is easy to understand why incoming engineering students choose to come to DIT in such large numbers, it is not so easy to work out why students of engineering, more than many other DIT disciplines, are so reluctant to take the Erasmus opportunity – only 2.5% of the total DIT outgoing numbers having been made up of engineering and technology students as opposed to 41% for business studies and management, 15% for languages, 12% for creative arts and even 3.3% for architecture, urban and regional planning, as shown in Table 2. Some answers lie in an analysis of the preliminary surveys from 2011 and January 2015 outlined above.

Over the two survey groups a total of 54 students said they would consider going on an Erasmus exchange. The main reasons why they had not applied for Erasmus so far were, in order of frequency:

- Worry over costs (38)
- Lack of foreign language skills (32)
- Lack of information about Erasmus (27)
- Fear that the study programme abroad would be too different (21)

What would mainly attract these students to go on an Erasmus exchange are the following:

- Funding (39)
- The chance to go to an English-speaking country (33)
- More information about Erasmus (31)
- Erasmus mobility being built into their study programme (29)
- More opportunities to go on exchanges at different stages of their study programme (19)
- Preparatory foreign language classes at DIT (16)

What is clear from these findings is that students have very little information about Erasmus and are afraid of venturing into situations where they do not speak the language. Their fear of the costs involved in an Erasmus exchange mirrors the fear of students across the whole Erasmus programme area (Buisson & Jensen 2008, Vossensteyn et al 2010). Indeed, the grants awarded to Erasmus students are small (about €250 per month on average, as shown in the HEA report from 2012) and do not cover many of the expenses of going abroad but these students do not necessarily know this fact, as their awareness of Erasmus is so limited. It appears, therefore, that they would quite like to go abroad – and preferably to an English-speaking country – if they were paid and obliged to do so (with the mobility built in to their programme at some stage). Some would be encouraged by foreign language classes but perhaps more would be influenced by the increasing number of European study programmes now being offered through English. This would not preclude the need to offer language classes so that students could cope with day to day life at their destination.

Conclusion

The typical Erasmus student is female, 22 years old and studying business studies and management or languages (European Commission 2015a) while the typical DIT engineering student is male and aged between 18 and 22 years old and considerably less likely to go on an Erasmus mobility than students from many other disciplines (see Table 2). However, DIT does not fair badly compared with other Irish higher education institutions in the number of engineering students it sends abroad for Erasmus exchanges (see Table 1) so the difficulties discussed here are not unique to DIT. What is also clear is that numbers of students taking up Erasmus opportunities can fluctuate greatly from year to year (see Tables 1 and 2). Further research is needed to ascertain why this might be the case but my own experience of dealing with Erasmus issues over the last decade leads me to the view that it may have to do with changes in study programmes (with student mobility being included or dropped from programmes over time) or changes in

personnel dealing with Erasmus so that the amount of information being given to students may vary, depending on who is responsible for disseminating it. Information is the key to promoting an increase in the take-up of Erasmus mobility among engineering students. Students need to be informed at an early stage of their studies about what Erasmus partners each engineering discipline has to offer, what their period of study in the partner institution would involve and how it would fit in with their study programme, what the grant covers and what help they could expect with accommodation and administration at their host institution. Students who live with their parents would clearly have extra accommodation expenses if moving abroad but they would also need to know that, where they have Irish government grants, these can be taken with them during their Erasmus period, while part-time jobs are also not precluded during Erasmus mobility (European Commission 2015a) and could help both to fund additional expenses and improve the students' linguistic competence in the foreign language. Where partner institutions offer study through English, this needs to be clearly advertised, and language classes could be offered to support the online linguistic preparation currently being developed for the Erasmus+ programme (European Commission 2015a). European Project Semesters are another useful way of encouraging students to take the plunge by offering to "train engineering students from different countries to work together in cross-cultural and multidisciplinary project groups" (Chojnacka et al 2000, p. 1) and these are often held in English for the benefit of students from a wide range of linguistic backgrounds.

Perhaps the draw of improving their English language competence, such a necessary skill in the global economy today, will mean that incoming students will always be more attracted to institutions in Ireland than Irish students will be attracted to go to non-English speaking countries and that the numbers of incoming and outgoing students can never achieve a balance. This also means that the benefits of Erasmus mobility cannot be shared equally across European Union countries, either. A study on the international migration of engineering students (de Grip et al 2009) suggests that students who undertake study periods abroad are more likely to migrate for work on graduation. This may not be an issue for Irish engineering graduates as Ireland has a high level of graduate migration in any case, frequently to the traditional English-speaking countries: USA, Canada, Australia and the UK. However, if more engineering programmes were to build in an Erasmus component, either a study or work placement period abroad, would this not help to turn the focus of Irish students towards their European partners and give them the additional skill sets of foreign language competence and intercultural awareness that would help them in the global economy beyond the English-only world, such as their incoming Erasmus counterparts currently enjoy? In other words, to counteract the very few pull factors attracting engineering students towards Erasmus mobility, perhaps they need more of a push.

This research is at an early stage. The next phase is to examine the experiences of DIT engineering students who have successfully undertaken Erasmus mobility and to evaluate their experiences. So far, I have received a

survey response from only one such student and have not included it here. With the current increase in outgoing Erasmus students in the 2014-15 academic year I hope to capture the responses of a larger group and continue the survey over the coming years. I intend to survey students who have gone on non-Erasmus exchanges to the USA and other English-speaking countries and also to identify which Erasmus participants were offered English-language mobility by their European partner institutions, so that the experience of English-language mobility programmes within Europe and elsewhere can be compared with ones offered through foreign languages (if any will continue to exist among DIT's active Erasmus partners into the future). The interest or lack of interest in the option of embedding foreign language modules into DIT engineering programmes (degrees in engineering "with a language") will also be explored.

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