
THE TRAVEL AND TRANSPORT IMPLICATIONS OF UNIVERSITY CHOICE: CASE STUDIES IN THE UK AND IRELAND

Dr Lisa Davison
Rees Jeffreys Lecturer in Transport Studies
University of Ulster

Dr Aoife Ahern
Senior Lecturer
University College Dublin

Professor Julian Hine
Professor of Transport
University of Ulster

Abstract

There are many influences on the optional life-stage of attending university and indeed which university to attend. Amongst those influencing university choice are geographical location and cost. United Kingdom policies regarding tuition fees are a devolved issue resulting in differential fees between England, Scotland, Wales and Northern Ireland, with home students often being provided more attractive offers financially. In addition the Republic of Ireland is geographically, and in some cases culturally, more attractive to students within Northern Ireland. Within this context a case study approach is adopted to examine mobility within and between geographical areas in the UK and Ireland. Drawing on a survey response at the university and undergraduate level this research examines how characteristics of the university and course selected influence choice as well as more personal influences such as cost and family ties. The transport implications of these decisions are considered with respect to day to day transport demands and travel between home and term-time address. It is intended that these results will be geo-referenced allowing for a greater understanding of how socio-demographics influence university choice and to provide a better understanding of mobility from the undergraduate's perspective.

Introduction

The purpose of this research is to better understand university choice across the UK and Republic of Ireland and how this influences travel demand. Research has pointed to a number of factors playing a role in the university choices of students, for instance geographical location, race (Gibbons and Vignoles, 2012) and costs (Brown and Ramsden, 2009). Given that fees have increased significantly in many universities in England, Northern Ireland and Wales, it is timely to investigate how this is impacting upon student mobility in the UK. Comparisons with the decisions of students in Scotland and Ireland, where fees have not been reintroduced, will be carried out in this work, to examine if cost of education is a more important determinant of university choice when quantifying a range of influences. This will provide a context to examine the travel and transport implications of university choice with consideration for the differential tuition fees and other influences.

Context

In the UK there have been significant changes in how higher education has been funded since the 1990s, with the burden of cost lying more and more heavily on the individual than on the state (Pollard et al, 2010). In the broadest sense, the objective of this has been to ensure that those benefitting from attending Higher Education make a greater contribution to the cost of that education and this has led to the introduction of tuition fees for students in 1998. Yet, as highlighted by Gallacher and Raffe (2012) different values and ideologies exist across the 'home countries' and, assisted by administrative devolution, this has resulted in differential tuition fees across the UK and the island of Ireland. Initially UK-wide tuition fees were set at £1,000, levied as an upfront fee with reductions for poorer students. Fee levels increased in line with inflation. At the same time student loans replaced maintenance grants.

Scotland was the first to diverge from a UK-wide approach. Following the 1999 Cubie report, education at Scottish universities was free at the point of entry for Scottish-domiciled students, with an endowment of £3,000 added to student loans upon graduation. In 2007 the graduate endowment was abolished, providing an even stronger financial incentive for home students to study in Scotland. Considering the rest of the UK, in 2004, the Higher Education Act introduced variable tuition fees this resulted in fees being capped at £3,000 per annum from September 2006 in England and Northern Ireland and September 2007 in Wales. Further provisions of the act were to defer payment of fees until graduation and to pave the way for student support to be devolved to the Welsh Assembly Government. The latter allowed for the Welsh Assembly Government to offset the increased in feed for Welsh-domiciled students studying at an institution in Wales; this was maintained until 2010.

Following the 2010 Browne review of institutions in England the cap on fees was significantly increased to £9,000 per year in 2012, tuition fees up to this amount were charged irrespective of the country of domicile. Universities in Wales followed suit, though students domiciled in Wales are eligible for a non-means tested grant which reduces the annual fee to £3,465 irrespective of the country of study. Universities in Scotland have maintained the financial advantage for Scottish-domiciled students opting to study at home, most being eligible to receive a grant of £1,820 covering the full cost of tuition fees at most institutes, though concerns exist as to the sustainability of this. Similarly students domiciled in Northern Ireland now receive a financial advantage with tuition fees for home students maintained at £3,465, a rate extended to students from the Republic of Ireland. Students from other home countries studying at universities in Scotland and Northern Ireland may be charged up to £9,000. Students across the UK can avail of subsidised loans to pay these fees and also for living costs. These loans are paid back when income levels reach a particular threshold and the level of repayment is determined by income. Other grants and bursaries are also available to aid students on lower incomes. EU students in England, Northern Ireland and Wales must pay the same fees as UK students.

In contrast to much of the UK, tuition fees do not exist in Ireland. Fees were abolished in 1995 under the Free Fees Initiative. This initiative applies to any EU students attending an approved undergraduate course in a Higher Education institution in Ireland. However, while there are no tuition fees, students must pay a "student contribution" to the university or college which they attend. This is to cover other costs outside of tuition. The maximum level of this contribution is set by government and currently stands at €2500 but will rise to €2750 in September 2014 and €3000 in September 2015. A means-tested student grant system is in place to fund maintenance, tuition fees and what is called the student contribution. There is considerable on-going debate in Ireland regarding the possible re-introduction of tuition fees, particularly in light of current economic climate and declining funding from central government for Higher Education Institutions, with much of the same arguments that preceded the introduction of tuition fees in the UK being made: universities, those in favour of the re-introduction fees argue, cannot continue at the current low levels of funding so some re-introduction of fees is inevitable.

Considering the introduction of fees, UCAS figures highlight that each successive increase in fees has led to dip in student applications and acceptances, yet the overarching trend is an increase in overall participation. In terms of the impacts upon student choices, Rolfe (2001) in a qualitative study of academic staff in English universities found that academic staff felt that the introduction of tuition fees had changed students' motivations from coming to university: they were more career-oriented, less likely to come to university just to study and wanted more guidance, more teaching and more notes. They were also more likely to be engaged in part-time working. Pollard et al (2010) state that variable fees have had little impact upon student choices, although acknowledge an increase in the number of English students at Scottish universities and Brown and Ramsden (2009) recognise that Welsh-domiciled students had an increased propensity to study at home, when financial incentives were provided. Considering the mobility between the UK geographical areas over a 15 year period Raffe and Croxford (2013) summarise that there is a growing trend for students to stay within their home country and, to a lesser extent, their home region, in the case of English-domiciled students. They recognised that this is partially influenced by policies to

'widen participation' at universities, a government objective to increase participation rates in Higher Education across administrations, particularly amongst disadvantaged and low-income groups (Pollard et al, 2010, Gallacher and Raffe, 2012). Other influences include the differential tuition fees, in particular for Scottish and Welsh-domiciled student, where in the case of the latter the proportion of students studying outside Wales did not return to earlier levels even once financial incentives were removed. Mobility amongst students domiciled in Northern Ireland, and to a lesser extent Wales, was influenced by supply and demand outside the realms of cost, essentially the degree courses were not available locally or student grades did not allow access to courses within the home country. Though unlike Northern Ireland, Welsh universities also attracted a comparatively high proportion of English students Reference was also made to movement between Republic of Ireland and Northern Ireland, which was identified as decreasing in response to the introduction of fees. Furthermore whilst students domiciled in Northern Ireland were equally likely to opt to study in England in 2010 when compared to 1996 the proportion studying in Scotland had experienced a significant decrease.

Travel and transport choice of university students

Whilst students are on average more likely to select a university closer to home (Gibbons and Vignoles, 2012) they are also identified by Dargay and Clark (2012) as being 'more likely to travel greater distances by rail and coach and for leisure and to visit friends and relative than the employed, but less by car and air' (p. 585). Indeed, while acknowledging students are more likely to choose universities close to home, Gibbons and Vignoles (2012) in their research conclude that being close to a Higher Education institution is not a primary factor in determining participation in Higher Education as the residences of those participating those not participating in Higher Education had similar distributions. They did find, however, that for those from lower incomes and socio-economic backgrounds distance and geographical location of the Higher Education institution become more important. Gibbons and Vignoles found, consistent with research in other countries, that students are more willing to travel long-distances away from home to access top-level universities. This is one element of student travel which this research will examine, a further element being the travel behaviour decisions of students accessing a university campus. This can be heavily influenced on where a student opts to live. Zhou (2012) found that the majority of students accessing UCLA lived within 60 minutes commuting distance of the campus had a higher propensity to use non-motorised or collective forms of transport when compared to the general population. Kamruzzaman et al. (2011) found that home location and car ownership have a significant impact on distance travelled and the distance travelled by the sample was much higher than population average, leading to a heavy reliance on the car.

By researching undergraduate choices for university selection in relation to home address (and if relevant term time address) this research intends to build understanding of travel patterns across institutions in the UK and Ireland to better understand the potential impacts.

Research design

The target population for this research was undergraduate students studying at universities in the Republic of Ireland and the United Kingdom. Individual universities acted as a conduit for targeting the wider student population. University registrars were contacted in order to determine their interest in the research and their willingness to participate. At each university an appropriate 'gatekeeper' was identified. Their role was to make students aware of the online questionnaire and to encourage completion. The gatekeepers used electronic means, either email or the Internet, to make students aware of the survey. Most participating universities communicated details of the survey on two occasions. The student-focused questionnaire considered the student's educational choices, living arrangements, travel behaviour, tuition fees and socio-demographic characteristics.

Overall the survey received 1052 useable responses, as summarised in Table 1 for each of the four geographical areas and the sample as a whole. Students from 17 universities are represented, this accounts for 9% of the 189 eligible universities. The primary reason for not participating was concern about survey fatigue amongst students and related to this the

need to prioritise internal survey and national student surveys. Response from universities agreeing to circulate the survey details ranges from 8 to 222 responses. In addition there were also a small number of students responding to the survey having received the link through other means. Whilst this was not part of sampling approach these are maintained as the focus is on differences by geographical area

Table 1 Characteristics and choices of respondents by country of study

Country	Gender		Age		Study mode		Academic year				Total
	Male	Female	25 and under	Over 25	Full time	Part time	1 st year	2 nd year	3 rd year	4 th year	
England	90 (23%)	297 (77%)	315 (82%)	71 (18%)	28 (6%)	431 (94%)	152 (33%)	127 (28%)	123 (27%)	57 (12%)	459 (44%)
Northern Ireland	43 (27%)	115 (73%)	119 (76%)	37 (24%)	23 (12%)	168 (88%)	59 (31%)	37 (19%)	56 (29%)	39 (20%)	191 (18%)
Scotland	54 (35%)	101 (65%)	142 (92%)	12 (8%)	5 (3%)	175 (97%)	45 (25%)	58 (32%)	56 (31%)	21 (12%)	180 (17%)
Republic of Ireland	47 (25%)	143 (75%)	169 (89%)	20 (11%)	6 (3%)	216 (97%)	77 (35%)	75 (34%)	45 (20%)	25 (11%)	222 (21%)
All	234 (26%)	656 (74%)	745 (84%)	140 (16%)	62 (6%)	990 (94%)	333 (32%)	297 (28%)	280 (27%)	142 (13%)	1052 (100%)

Understanding the influence of tuition fees

The revealed preferences of students highlight that 2% of students in studying at universities in one country have a term time address in another country. Mobility of this nature is predominant between Northern Ireland and Ireland with 5% of students studying in Northern Ireland living in Ireland and with 3% of students studying in Ireland with a term time address in Northern Ireland. Proportions travelling between other countries and universities in Scotland and England were considerably lower, though a small proportion of students did travel from Wales to England. Of the students responding to the survey 48% have a separate home and term time address, though this differs significantly by country ($\chi^2(3, N = 1051) = 34.76, p = .00$) with students at university in England being most likely to have a separate term time address (57%) and those at universities in Scotland and Northern Ireland being least likely (37%). Of those with a separate address a further 8.4% have different 'domicile' to the institute they study at. From this it is clear that Scottish universities are most attractive, with 11% of respondents studying there rather in the country of domicile. This type of mobility was most apparent with respect to students domiciled in Ireland and Northern Ireland. From the response Ireland is most attractive to European students, whereas students domiciled in Wales are well represented at universities in England. This supports the centrally collated statistics and highlights that there is some mobility between each of the geographical areas. Looking at the from the students perspective students domiciled in Northern Ireland and Ireland make up the highest proportion of students studying in a different country, whereas students domiciled in England were less mobile, followed by students domiciled in Scotland.

The cost of tuition or registration fees are summarised in Table 2 by country of institute and year of study, there is significant difference for both main effects of country ($F=10.838, p < .001$) and year of study ($F=5.976, p < .001$) and interactions ($F=9.454, p < .001$) according to a two-way ANOVA. In some instances this is based on student perceptions of what they pay rather than actual costs, despite the question stating to include full costs. This difference in reporting was restricted to students where a governmental or public body such as the the Scottish Government or the National Health Service paid the fees directly to the university. Whilst, some students reported the costs to themselves (usually 0) others were aware of the amount covered and included details of this. This summary also includes tuition fees for students from other domiciles, which may inflate the values, however the number of

responses does not allow for further interrogation of this data. It highlights that, with the exception of England where the recent increase is reported, there has been limited fluctuation across the different year groups and that on balance tuition fees are lowest in Scotland.

Table 2: Tuition and registration fees by academic year and country of study

Country	England			Northern Ireland			Scotland			Republic of Ireland*		
	M	S. D.	N	M	S. D.	N	M	S. D.	N	M	S. D.	N
Year of study												
1 st	9032	8465	116	3273	1385	47	2467	2448	37	2896	1781	62
2 nd	3475	1998	105	3266	1161	30	1780	1139	43	2989	1846	64
3 rd	3385	2127	103	3499	1357	41	2022	1831	45	3019	1541	39
4 th	3486	1331	48	3168	1459	30	2346	4173	17	3485	3722	22
Other	5101	3220	4	2325	2370	2				2066		1
Total	5183	5592	376	3300	1352	150	2103	2239	142	3018	2063	188

*Transferred from Euro to GBP, exchange rate 1 EUR = 0.860962 GBP

Students were also asked whether they considered the cost of studying and / or living in another geographical area when making a decision about where to study. A high proportion of respondents studying at a university in Northern Ireland had investigated the cost of studying in England (30%), Scotland (30%) and the Republic of Ireland (24%). Similarly a high proportion of those studying in the Republic of Ireland had considered England (28%), Northern Ireland (27%) and Scotland (24%), plus Europe (14%) and further afield (13%). Students studying at universities in Scotland demonstrated an interest in the cost of studying in England (28%) but demonstrated lower interest in other countries. Despite the high levels of tuition fees in England, of those studying there a smaller proportion investigated the cost of studying elsewhere.

Other influences upon university choice

As well as the influence tuition fees this research examined a range of influences upon university choice, which include factors specific to the university and course, the destination and the surroundings, the distance from family and friends and also the cost. From this it is clear that with the exception of the research carried out by the university students consider each of these elements as more 'important' than 'unimportant' when making their decision about where to study. For the majority the course they would like to do and the grades required are the main focus. This is followed by the characteristics of the university including the reputation, approach to teaching and facilities, then cost, with cost of living being slightly more important on balance than the cost of tuition fees. Whilst there was limited importance ascertained to the leisure facilities near the university a number of students highlighted that the local environ in important, highlighting preferences from 'a rural idyll' to considering the 'feel' and size of the city. Most other open responses supported the existing statement, with the exception that a large number of students also valued the opportunity for a placement or exchange year. It is worth noting that each of these factors is heavily correlated the exceptions being the relationships between proximity to family and friends and the course and the reputation of the university in particular, but also the research carried out at the university and in the case of those valuing proximity to family the facilities at the university.

Furthermore there are significant differences between the country of study and the importance of the following factors:

- The qualifications required ($\chi^2(12, N = 1050) = 31.991, p = .00$) and the reputation of the university ($\chi^2(12, N = 1049) = 40.305, p = .00$)
- The approach to teaching ($\chi^2(12, N = 1048) = 27.502, p = .01$) and the facilities at the university ($\chi^2(12, N = 1048) = 29.989, p = .00$)
- The cost of the course ($\chi^2(12, N = 1049) = 97.544, p = .00$) and the cost of living ($\chi^2(12, N = 1048) = 23.314, p = .03$)

- The proximity to friends ($\chi^2(12, N = 1041) = 24.191, p = .02$) and the leisure activities available in the area ($\chi^2(12, N = 1047) = 23.508, p = .02$)

There is no significant difference regarding the research carried out by the university and the proximity to family and country of study. Given the approach to sampling, efforts are required to better understand the university specific influences on such associations before examining these in more details.

Transport implication of university choice

As highlighted above, 48% of students have a separate term time and home address; Table 3 outlines the transport and travel options available to students for the most recent journey between their home address and their term time address or university. The options and market share for car as a driver and bus is similar for the journey between the university and term time address as the journey home, whereas there are differences regarding the non-motorised modes and train, with the former being less of an option and rail-based public transport comprising a greater market share.

Table 3: Mode of travel between home address and university / term time address

	A selected option	An option but not selected	Not sure if it is an option	Not an option
Car driver	234 (42%)	57 (10%)	8 (1%)	257 (46%)
Car passenger	124 (23%)	152 (28%)	24 (4%)	241 (45%)
Bus/coach	158 (28%)	233 (41%)	42 (7%)	130 (23%)
Train / tram	198 (35%)	212 (37%)	13 (2%)	147 (26%)
Bicycle	8 (2%)	28 (6%)	6 (1%)	459 (92%)
Walking	12 (2%)	17 (3%)	4 (1%)	472 (93%)
Aeroplane	62 (12%)	38 (7%)	12 (2%)	404 (78%)
Ferry / boat	20 (4%)	35 (7%)	5 (1%)	444 (88%)
Other	2 (1%)	6 (2%)	10 (3%)	311 (95%)

The main mode being car as driver (32%), followed by bus (16%), train, tram or underground (14%), car as a passenger (10%) and aeroplane (7%); multi-mode also features for 21% of respondents. There is a significant relationship between this choice and:

- Distance ($\chi^2(15, N = 496) = 31.27, p = .01$) and time travelled ($\chi^2(15, N = 474) = 29.00, p = .02$)
- The frequency at which the journey is made during semester 1 ($\chi^2(10, N = 451) = 58.87, p = .00$) and is expected to be made during semester 2 ($\chi^2(10, N = 405) = 52.10, p = .00$).
- Mode choice for travel between term time address and university ($\chi^2(30, N = 603) = 618.81, p = .00$)
- Age ($\chi^2(5, N = 573) = 63.33, p = .00$).

Regarding distance and time travelled the strength of the relationship is lower when compared to selecting everyday travel. The choice to fly only features for the longest distances, whereas car is most important mid-distances and bus for the lower distances, train features across a range of distances and as with everyday travel there are differences between the time taken and the mode selected. The frequency of journey home is related to mode choice, with aeroplane accounting for the least frequent journeys and bus or coach for the most frequent journeys. Journeys by car are also popular for frequent and medium frequency journeys and trains for medium frequency journeys. There are similar pattern each semester. Regarding mode choice students often use the same mode for everyday travel as they do for the journey to where they live, though there is evidence for transfer between modes, for instance for students who travel by bus regularly, travelling home as a passenger is a popular option and vice versa. Regarding students over 25 are more likely to travel as a car driver and less likely to travel as a car passenger or by public transport. The relationship

with gender is insignificant and there is no a priori assumption that frequency of travel to the university will influence the mode chosen for the journey between home address and university / term time address.

Table 3 outlines the transport and travel options available to students for the most recent journey between the address which they live at during term time and university. To summarise the majority of students choose to travel by car if there is one available to them and whilst bus and coach is an option for many it is only the selected option for 29%. Non-motorised modes are available for many students, walking is a popular choice, whereas cycling is less popular.

Table 3: Mode of travel between term time address and university

	A selected option	An option but not selected	Not sure if it is an option	Not an option
Car driver	343 (41%)	121 (14%)	4 (0%)	369 (44%)
Car passenger	126 (16%)	218 (27%)	56 (7%)	398 (50%)
Bus / coach	244 (29%)	372 (44%)	42 (5%)	192 (23%)
Train / tram / metro	167 (21%)	218 (27%)	21 (3%)	389 (49%)
Bicycle	58 (7%)	254 (32%)	19 (2%)	451 (58%)
Walking	260 (32%)	140 (17%)	3 (0%)	406 (50%)
Other	13 (2. 4%)	20 (4%)	43 (8%)	476 (86%)

This transfers into the main mode of travel being car or motorbike as driver (29%), followed by walking (19%), bus (15%), train, tram or underground (10%), car or motorbike as passenger (4%) and bike (4%). In addition 18% of respondents travelled by more than one mode. Significant influences on the choice of main mode for the journey to university (or modes) include:

- Choice of accommodation ($\chi^2(12, N = 930) = 222.66, p = .00$) and whether this differed during term time ($\chi^2(6, N = 942) = 111.30, p = .00$)
- Distance ($\chi^2(18, N = 943) = 245.77, p = .00$) and time travelled ($\chi^2(18, N = 874) = 162.76, p = .00$) and the frequency at which the journey is made ($\chi^2(24, N = 942) = 70.19, p = .00$)
- Gender ($\chi^2(6, N = 879) = 13.04, p = .45$) and age ($\chi^2(6, N = 943) = 63.33, p = .00$).

Regarding accommodation students opting to live with parents are most likely to travel using public transport, those in university accommodation to walk and those in their own home to travel by car, this is reflected in whether students have a different term time address. In terms of distance travelled non-motorised modes predominate for shorter distances, bus for medium length distances and train and car for longer distances. There is a slightly different pattern when it comes to time travelled, suggesting that mode choice influences travel time. The number of times a student travels to campus each week was also influenced by mode with students who travelled to campus least frequently being most likely to travel by car, whereas those travelling more frequently taking the bus or walking. The relationship between gender and mode choice is lower but males are more likely to cycle and females more likely to travel as a passenger, though each are equally likely to opt to drive. The influence of age is clear, students over 25 are most likely to drive, whereas those 25 or under more likely to travel by public transport or walk. When considering the tools available to support mode choice, significant relationships exist between the selected mode and whether the student had a parking permit ($\chi^2(18, N = 849) = 271.59, p = .00$) or a season ticket for public transport ($\chi^2(18, N = 868) = 300.20, p = .00$), though there is some evidence of movement between modes, with car drivers having access to a season ticket and vice versa.

In addition, mode choice differs by country ($\chi^2(18, N = 943) = 353.72, p = .00$), with levels of car dependence being highest in Northern Ireland, followed by England, and the highest proportion of students selecting public transport in the Republic of Ireland and Scotland. In Scotland walking was also a popular choice for a greater proportion of students. One note being that the influences on this choice may be related to differences in university

characteristics as opposed to country level difference, an element that will be examined further in relation to the available data.

Conclusions and Recommended Further Work

This research demonstrates that tuition fees have a distinct influence on the decision making process when deciding which university to attend and whether to study in the country of domicile. It also highlights the high levels of mobility that students on the island of Ireland have when selecting a university both in examining the options available and in accepting a position. The descriptive statistics quantify the influence of factors relating to the university and the surroundings, the teaching and research culture, overall costs and the student's social network prior to selecting a university. Many of these factors are important to the students, with those relating to the course and the university generally being more important than the cost. On exception regarding the university is that students consider do not value the research carried out by the university as important when compared to other factors.

The travel implications of choices in relation to home address has a clear influence on mode choice and frequency of travel, as does the distance between term time addresses and university. Aeroplanes, boats and trains feature most for longer journeys between university and non-term-time address, whereas cars are an option for the mid length journeys and bus or coach for the shorter journeys. Again shorter journeys are made more frequently. Considering everyday travel, non-motorised travel modes and the bus tend to account for shorter journeys they also account for more frequent journeys, whereas journeys by car and to an extent train account for longer, less frequent journeys. Other influencing factors include age for the journey between home address and university / term time address and gender and age influence also influence everyday travel choices and there is a relationship between mode used for everyday travel and mode used.

For a full appreciation of the transport and travel impacts of mode choice students' occasional and regular travel need to be considered at disaggregate level, future work in relation to this will include calculating the emissions from travel on an individual level and examining how these differ according to other variables. In addition, there are significant differences between country of study and influences on choices including university choice, where to live during term and mode of travel for occasional and regular travel. Future analysis aims to quantify the influence of university and individual characteristics in making such choices and alternatively the influence of country and individual level characteristics. Geographical Information System will be used to map and interrogate the data; it will also play a role in communicating key findings.

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