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Article

Relationship between Entry Grades and Attrition Trends in the Context of Higher Education: Implication for Open Innovation of Education Policy

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Abstract: Student retention has emerged as a significant and expensive challenge for higher education institutes worldwide. Although several studies have been conducted on increasing student numbers and diversity in higher education institutes, studies on the relationship between student retention and entry grades are limited, particularly in the UK. The aim of this paper was to examine the relationship between entry grades and student attrition in the context of higher education in the UK. A quantitative methodology was used in this study, wherein data were derived from secondary sources, including University and Colleges Admissions Service (UCAS) tariff points and full- and part-time undergraduate student enrolment between 2012 and 2017. The data were extracted and analyzed using Higher Education Statistics Agency (HESA) performance indicators. The findings indicate that there exists a clear association between entry grades and student retention for part-time students, which may aid policy makers, academics, university staff, and higher education stakeholders to develop appropriate strategies to address attrition levels.

Keywords: higher education; student retention; HESA performance indicators; entry grades; stakeholders

1. Introduction

The already large student community is growing worldwide, particularly among those pursuing higher education—both in full-time degrees and part-time higher education courses [1]. Higher education institutions have long been concerned with student retention, with the aim that once students register for their education, they should remain and complete their course effectively, gaining the knowledge that they require. However, student attrition has emerged as a significant and expensive challenge for higher education institutes worldwide [2]. Until recent times, the central focus of institutional and governmental policy was on broadening entrance to higher education for inadequately represented groups [3]. However, emphasis is now placed on student retention and graduate employment.

A recent report released by the Higher Education Statistics Agency showed that in the last five years, student retention among full-time students in higher education institutes in the UK poses significant challenges following the first year [4–6]. Furthermore, it is noted that only approximately 14% part-time students managed to successfully complete their courses [7]. At the same time, 13% were enrolled in higher education courses that had a 27% rate of six-year persistence on the whole. If only 27% of students were successful in completing their part-time courses, it is quite an alarming prospect

for stakeholders in higher education as this indicates that almost three-quarters of part-time students dropped out of their courses.

Based on progress indicators, it was found that a large number of part-time students dropped out before even reaching the second year of their courses [8]. Thus, higher student attrition rates among both full- and part-time students has become a global challenge and is on the whole, perceived as a waste of valuable resources. Moreover, the outcomes that arise from student attrition can impact societies as well as individuals. For individuals, student attrition results in the loss of an opportunity to enhance their lives as well as poor employment prospects [9]. For society, student attrition results in a major waste of resources. This eventually translates into the loss of other educational training and projects in other parts of the economy and society [10].

Over the years, a large number of researchers have explored the theme of student retention; it has become the bane of higher education across the world. The drop-out rates for full-time educational courses within the UK is said to be approximately 20%, which varies from 1 to 2% for 'Oxford Universities' and up to 35% for higher educational institutions that have less rigorous policies for student entry. Governments are keen to ensure efficiency within higher education not only due to considerations for the labor market on the whole, but also due to accountability issues with regards to funding from the public [11].

Considering that student attrition not only impacts students [12,13] but also translates into unwanted expenditure for higher education institutes as student retention is a key factor contributing to their success [3,14], individuals, the economy and society as a whole, a novel approach or study could be instrumental in the development of suggestions. Suggestions thus formed can be utilized to overcome the challenge of student attrition and enhance student retention rates both for full-time and part-time education. Thus, against this backdrop, this paper attempts to perceive issues with regards to the association between student retention and low entry grades across UK higher education institutions offering both full-time and part-time courses. This paper uses the terms 'non-continuation', 'retention' or 'attrition' interchangeably with regards to pre-university grades or entry grades to university. This includes the development of activities and policies by higher education institutions aiming to minimize course drop outs, helping students to remember the educational objectives they had intended to achieve. Based on the above background, the following research objectives have been framed for this research:

- (1) To examine student enrolment at the postgraduate and undergraduate levels for full-time and part-time courses in Higher Education [HE].
- (2) To examine the difference in part-time and full-time students between postgraduate and undergraduate study.
- (3) To examine the relationship between entry grades and student attrition among young as well as mature participants in full-time or part-time courses.
- (4) To examine the difference in the non-continuation in the year following entry among part-time and full-time first-degree entrants in different countries of the UK.

2. Literature Review

From an educational point of view, reference [15] define student retention as the process through which students can be assisted in terms of meeting their requirements, thereby facilitating them to persevere in their educational endeavors. Thus, apart from non-continuation, there are other terms which have been frequently utilized to elucidate and signify the theme of student retention. Some of these terms include drop outs, withdrawal, interruption of study, non-achievement, wastage, exits, attrition, failure, leaving early, non-completion, departure, non-survival, non-progression, walk away, non-persistence, and stop out [16,17]. Since different researchers, scholars and stakeholders utilize varied terms to elucidate what the subject matter is, there is a possibility that they might approach the challenge from entirely different theoretical perspectives altogether. Higher education institutions

within the UK are commonly known to use the term ‘retention’, whereas other stakeholders such as the Higher Education Funding Council for England (HEFCE) prefer to utilize the term ‘non-continuation’.

There exists a wide range of literature which focuses on student retention, the challenges and outcomes of attrition in higher educational settings. For instance, a study done by [9] discussed the attrition rates in higher education generally and considered the resulting effects harmful on a personal level and on an institutional level in Australia, compared with other countries. Furthermore, a study carried out by Aljohani, reference [18] examined the low student retention among Saudi higher education students’ and found that the low institutional factors and academic abilities are the most common reason for low student retention among Saudi higher education students across all of the studies. Moreover, a recent study performed by Bowrey and Clements, reference [19] investigated the Performance Efficiency among Student Success Rates against Attrition, Retention and Student to Staff Ratios in Australia, whereas another study was performed by Hearn et al. [20], which examined the factors contributing to the retention and attrition rates of students at the selected Australian university. Thus, the significance of student retention and the steps taken to enhance their graduation outcomes in has been documented globally, i.e., in Europe, Australia and the USA [14,21]. Specifically, in the UK, reference [22] aimed to examine the barriers, motivations and challenges of young adult careers in higher education in the UK.

Irrespective of the philosophical viewpoint, scholars are of the opinion that the retention of students is very significant. To date, several aspects pertaining to this situation have undergone extensive research, but there has been scant research with regards to the link between entry grades and attrition trends, particularly in the United Kingdom (UK). While qualifications regarding entry have found mention across several studies, the focus of such studies was not holistic [23,24]. Rather, they looked into individual educational institutions and other associated issues such as academic progression, gender, student support, disability issues, socioeconomic background, particular population groups etc. There are several other researchers who noticed that the current association between widening access, and thus low-entry criteria and non-completion could not be bifurcated [25]. Other than that, the existence of a varied student population would imply that students who take non-conventional routes might sometimes find it a challenge to blend in and handle the already existing learning and teaching settings. They might also be holding different expectations with regards to the kind of support and learning contexts that are being extended [25].

A large number of researchers and scholars are in agreement with the fact that there is an intricate association between entry grades and success in higher education [26]. With regards to mature vs. young students, there are certain key variations that have been presented by Topham [27] in terms of the challenges they are confronted with. The major variation would pertain to the fact that students who are young learners tend to ineffectively plan out their courses while mature students, on the other hand, are found to be more critical about their overall higher education experience. They might also have major challenges in terms of finances and catering to the needs of their dependents [28].

In contrast, Jameel, Taylor, and Palmer [29] agree that young learners might not face the same degree of challenges as those of mature learners, which could be attributed to the fact that they usually reside with their parents, typically do not have any dependents, and finances might not be a major problem for them. However, Kearns [30], states that due to the incremental costs of higher education, there will be an intensification of the recruitment of mature students. However, there is a need to better meet their financial requirements. Furthermore, it is also observed that students who enrolled as part-time students may also be lacking a belief in their own self as compared to their full-time counterparts. However, there was no clear focus on the link between entry grades and retention among young as well as mature participants in full-time or part-time courses [31]. Therefore, the following directional hypotheses were framed.

Hypothesis 1a. *There is a significant decrease in enrolment among undergraduate students, and a significant increase in postgraduate, full-time, first-year students.*

Hypothesis 1b. *There is a significant decrease in enrolment among undergraduate students, and a significant increase in postgraduate, part-time, first-year students.*

Hypothesis 2. *There is a significant relationship between the non-continuation and entry grades of full-time and part-time, young and mature undergraduate entrants.*

Hypothesis 3. *There is a significant difference in part-time and full-time students between postgraduate and undergraduate study.*

Hypothesis 4a. *There is a significant difference in the non-continuation year of entry among part-time first-degree entrants among the different countries of the UK.*

Hypothesis 4b. *There is a significant difference in non-continuation year of entry among full-time first-degree entrants among the different countries of UK.*

In addition, in line with researchers' knowledge, not many studies have been conducted on examining entry grades and the non-continuation of students in the UK. This study aimed to bridge the existing gap in the literature by examining the association between student retention and low entry grades across the UK higher education institutions pursuing both full-time and part-time courses.

3. Methodology

The main aim of this paper was to examine the quantitative relationship between entry-grades and the non-continuation of students in the context of higher education in the UK. In this study, secondary data were utilized to quantitatively examine the association between student attrition and entry grades at par with the previous studies [32,33]. Secondary data collection facilitates research over a longer period of time and also enables the analysis of currently existing data using different methods. The data for this study were collected from The Higher Education Statistics Agency [6] student record, and secondary data were available in Microsoft® Excel® format, Higher Education Statistics Agency (HESA) Performance Indicators Index, available at [5] involving University and Colleges Admissions Service [UCAS] tariff points and full-and part-time undergraduate student enrolment between 2012 and 2017.

The data presented in this study cover young and mature full-time and part-time undergraduate students. The collected data present the student enrolments by level of study (full-time and part-time/first year), personal characteristics, non-continuation followed by a year of entry; full-time undergraduate entrants for both young and mature represent five periods (2012–2013 to 2016–2017) for each age group. The number of Postgraduate [PG] students was 919,935 while Undergraduate [UG] were 3,608,545 from 2012 to 2017. The number of part-time/full-time students in PG were 505,950 while in UG were 1,353,940. For non-continuation following year of entry-part-time first-degree entrants, those who are 30 years of age or more are considered mature students.

In this study, the collected secondary data were analyzed using SPSS software. Descriptive statistics were used to determine the number of students enrolled for full-time and part-time in higher education institutions. The independent sample *t*-test was used in this study to compare the means of two sets of data. The correlation analysis was used to correlate between non-continuation and entry grades for full-time and part-time, young and mature undergraduate entrants.

4. Findings

The data here pertain to full-time and part-time students in higher education institutions. Considering the alterations in statistical categories, techniques and terminologies in some instances, to enable accurate and direct comparison, the findings presented are segregated for different periods ranging between 2012 and 2017.

Demographic Data

The average number of total postgraduate research students was greater than for full-time students: 29,230 students with a maximum of 29,865 students and a minimum of 27,980 students, while there was an average of 6459 part-time students with a maximum of 6705 students and a minimum of 6145 students. The average total numbers of postgraduate students taught as well as first-degree enrolment students were more full-time than part-time.

As can be observed from Table 1 and Figure 1, the enrolment of full-time students within higher education by study level is projected by using an independent sample *t*-test. From Table 1, it is evident that during the period 2016–2017 there were around 765,480 student enrolments within every level as compared to 736,435 during the period 2015–2016, 723,100 during the period 2014–2015, 713,105 during the period 2013 and 699,425 during the period 2012–2013. This trend was significant at $p < 0.01$ in comparison to part-time study. Therefore, we accepted the following Hypothesis 1a.

Table 1. Higher education student enrolments by the level of study—full time/first year.

Level of Study	2012/13	2013/14	2014/15	2015/16	2016/17
Postgraduate					
Doctorate research	22,655	23,760	23,425	22,800	23,430
Other postgraduate research	5325	5780	6440	6775	5760
Total postgraduate research	27,980	29,540	29,865	29,575	29,190
Masters taught	140,615	146,470	146,180	147,120	168,445
Postgraduate certificate in education	23,810	25,200	24,440	23,325	21,705
Other postgraduate taught	10,755	10,670	9325	10,930	10,960
Total postgraduate taught	175,175	182,340	179,940	181,375	201,105
Undergraduate					
First degree	433,135	467,860	480,505	495,265	503,830
Foundation degree	14,780	14,370	13,760	11,335	12,515
Higher National Certificates (HNCs) and Higher National Diplomas (HNDs)	5080	5705	5700	5325	4970
Professional graduate certificate in education	1550	1365	1080	975	850
Other undergraduate	11,725	12,930	12,250	12,585	13,020
Total other undergraduate	33,135	34,370	32,790	30,225	31,355
Total all levels	669,425	714,105	723,100	736,435	765,480

Total postgraduate full time vs. part time $p < 0.001$; total undergraduate full time vs. part time $p < 0.001$ (refer to Table 2).

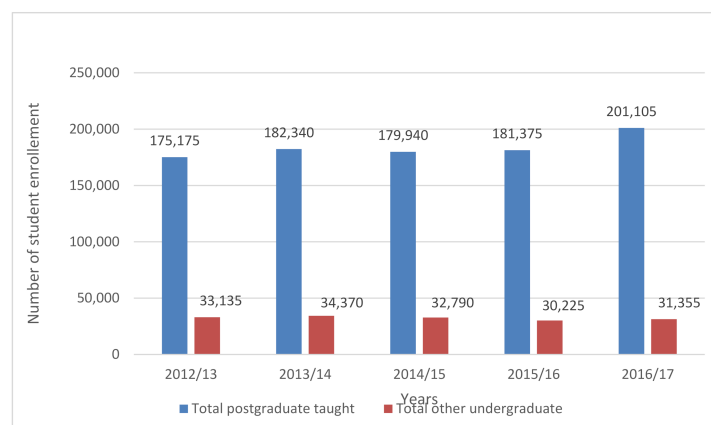


Figure 1. Higher Education [HE] student enrolments by level of study by postgraduate vs. undergraduate—full time/first year.

Table 2 and Figure 2, on the other hand, highlights the enrolment of part-time students within higher education by study levels, using the independent sample *t*-test. It was found that during the period of 2012–2013, a total of 302,830 students were enrolled within every level as compared to 281,635 in 2013–2014, 265,785 in 2014–2015, 255,690 in 2015–2016 and 248,000 in 2016–2017. Hence, we accepted the Hypothesis 1b.

Table 2. HE student enrolments by level of study—part time/first year.

Level of Study	2012/13	2013/14	2014/15	2015/16	2016/17
Postgraduate					
Doctorate research	4970	4975	4735	4615	4670
Other postgraduate research	1625	1730	1720	1790	1475
Total postgraduate research	6590	6705	6450	6405	6145
Masters taught	44,090	45,450	44,155	43,380	48,700
Postgraduate certificate in education	1670	1315	1040	1095	855
Other postgraduate taught	50,540	52,795	56,305	56,240	58,320
Total postgraduate taught	96,300	99,555	101,500	100,715	107,880
Undergraduate					
First degree	62,195	54,130	46,385	47,310	44,590
Foundation degree	9630	8835	7260	6490	5275
Higher National Certificates (HNCs) and Higher National Diplomas (HNDs)	3815	4005	3825	4110	3590
Professional graduate certificate in education	1140	770	600	585	455
Other undergraduate	123,165	107,640	99,765	90,075	80,065
Total other undergraduate	137,745	121,245	111,450	101,260	89,390
Total all levels	302,830	281,635	265,785	255,690	248,000

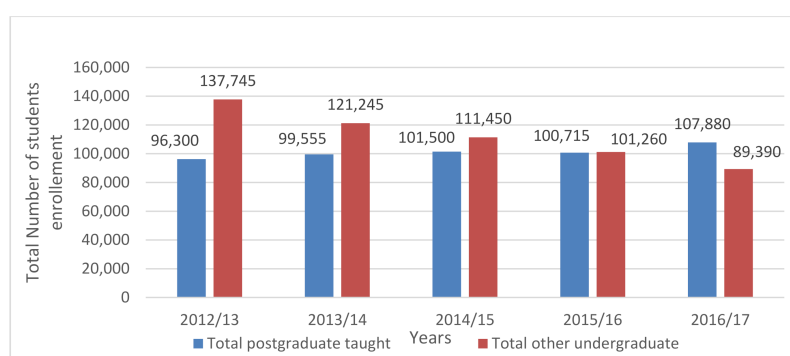


Figure 2. HE student enrolments by level of study by postgraduate vs. undergraduate—part time/first year.

Table 3 depicts the relationship between non-continuation in the year following entry and full-time as well as part-time young and mature undergraduate entrants by using correlation analysis. Non-continuation was positively related with entry grades both for full-time young ($r = 0.999$, $p < 0.01$), full-time mature ($r = 0.998$, $p < 0.01$), part-time young ($r = 0.994$, $p < 0.01$), part-time matured ($r = 0.994$, $p < 0.01$) undergraduate entrants. Hence, we accepted the Hypothesis 2.

Table 3. Correlation between non-continuation following the year of entry among full-time and part-time young and mature undergraduate entrants.

		Non-Continuation	Entry Grades
Full time	Young	Non-continuation	1
		Entry grades	0.999 **
	Mature	Non-continuation	1
		Entry grades	0.998 **
Part time	Young	Non-continuation	1
		Entry grades	0.994 **
	Mature	Non-continuation	1
		Entry grades	0.991 **

** $p < 0.01$.

Table 4 shows that there is a significant difference in undergraduate and postgraduate students between part-time and full-time studies. Since the p values for total postgraduate research ($p = 0.009$), total postgraduate taught ($p = 0.009$), first degree ($p = 0.009$), total other graduate ($p = 0.009$) and total all levels ($p = 0.009$), there was a significant difference in the mean rank of the total postgraduate research, total postgraduate taught, and first degree, total other undergraduate and total all levels between full-time and part-time students. Therefore, we accepted the following Hypothesis 3.

Table 4. Difference in the mean rank of total postgraduate research, total postgraduate taught, and first degree, total other undergraduate and total all levels between the full-time and part-time students using the Wilcoxon W test.

	Type	N	Mean Rank	Sum of Ranks	Wilcoxon W	p -Value
Total postgraduate research	Full time	5	8.00	40.00	15.000	0.009 **
	Part time	5	3.00	15.00		
	Total	10				
Total postgraduate taught	Full time	5	8.00	40.00	15.000	0.009 **
	Part time	5	3.00	15.00		
	Total	10				
First degree	Full time	5	8.00	40.00	15.000	0.009 **
	Part time	5	3.00	15.00		
	Total	10				
Total other undergraduate	Full time	5	3.00	15.00	15.000	0.009 **
	Part time	5	8.00	40.00		
	Total	10				
Total all levels	Full time	5	8.00	40.00	15.000	0.009 **
	Part time	5	3.00	15.00		
	Total	10				

** $p < 0.01$.

Table 5 is indicative of the individual characteristics of full-time students who were enrolled between 2012–2013 and 2016–2017. During the period of 2016–2017, it was found that the total number of students were around 503,830 as compared to 495,265 during 2015–2016, 480,510 during 2014–2015, 497,855 during 2013–2014 and 433,135 during 2012–2013. Taking into account the gender among the total number of enrolments, it was observed that the number of enrolments amongst females was higher as compared to males. Similarly, when the age groups of the number of all the students were taken into account, it was found that students who fell under the age group of 20 and below showed more enrolment as compared to those students who fell under the age groups of 21–24, 25–29 and above 30 years.

Table 5. HE student enrolments by personal characteristics: 2012/13 to 2016/17 first year/first degree—full time.

Category	2012/13	2013/14	2014/15	2015/16	2016/17
Sex					
Female	237,105	255,765	265,040	276,010	281,190
Male	196,015	212,055	215,400	219,130	222,475
Other	15	35	70	125	160
Age group					
20 and under	333,770	364,095	376,220	389,655	396,670
21–24 years	56,860	59,745	59,015	58,855	58,000
25–29 years	18,100	19,265	19,405	19,860	20,025
30 years and over	24,395	24,755	25,860	26,890	29,135
Age unknown	5	0	5	0	0
Disability status					
Known disability	39,955	45,950	50,490	55,360	59,780
No known disability	393,175	421,910	430,010	439,900	444,050
Ethnicity					
White	270,515	292,645	298,535	301,890	302,200
Black	26,655	28,710	30,450	32,760	34,645
Asian	38,825	42,320	44,675	48,580	51,185
Other (including mixed)	18,100	20,240	21,985	24,270	25,530
Not known	2940	3045	3515	3565	4000
Total UK domiciled students	357,030	386,960	399,160	411,070	417,560
Total all students	433,135	467,860	480,505	495,265	503,830

The figures presented in Table 6 (below) were representative of the individual traits of part-time students within higher education, who were enrolled between the periods of 2012–2013 and 2016–2017. It was found that during the period 2012–2013, the overall number of students who were enrolled was 62,195 as compared to 54,130 during the period 2013–2014, 47,310 during the period 2015–2016, 46,385 during the period 2014–2015 and 44,590 during the period 2016–2017. With regard to gender, it was found that the overall number of females was comparatively higher than in males. While taking the age group into account, students who fell under the age group of more than 30 years were higher as compared to those under the age of 20 and below 21–24 and 25–29.

Table 6. Higher education student enrolments by personal characteristics: 2012/13 to 2016/17 first year/first degree–part time.

Category	2012/13	2013/14	2014/15	2015/16	2016/17
Sex					
Female	37,495	32,115	27,745	28,265	26,390
Male	24,695	22,010	18,635	19,040	18,190
Other	0	0	0	5	5
Age group					
20 and under	5740	5295	4510	5335	5795
21–24 years	12,090	11,220	8985	9395	8970
25–29 years	11,680	10,865	9610	9750	9150
30 years and over	32,665	26,745	23,275	22,835	20,665
Age unknown	20	0	0	0	5
Disability status					
Known disability	7890	6745	6565	7060	6980
No known disability	54,305	47,385	39,815	40,250	37,610
Ethnicity					
White	50,245	44,545	38,595	39,640	37,620
Black	3555	2880	2430	2490	2040
Asian	2480	2125	2115	2095	1985
Other (including mixed)	1855	1730	1570	1545	1510
Not known	1200	870	885	880	785
Total UK domiciled students	59,330	52,150	45,590	46,645	43,940
Total all students	62,195	54,130	46,385	47,310	44,590

Table 7, which pertains to the enrolment of full-time students into higher education institutions on the basis of the study level, it has been observed that during the period 2016–2017 there were around 765,480 enrolments within every level as compared to 736,435 during the period 2015–2016, 723,100 during the period 2014–2015, 714,105 during the period 2013–2014 and 669,425 during the period 2012–2013.

Figures presented in Table 8 are representative of part-time students within higher education on the basis of their study levels. The findings revealed that during the period 2012–2013, the number of enrolments was around 302,830 at every level as compared to 281,635 during the period 2013–2014, 265,785 during the period 2014–2015, 255,690 during the period 2015–2016 and 248,000 during the period 2016–2017.

Table 7. Higher education student enrolments by level of study—first year/full time.

Level of Study	2012/13	2013/14	2014/15	2015/16	2016/17
Postgraduate					
Doctorate research	22,655	23,760	23,425	22,800	23,430
Other postgraduate research	5325	5780	6440	6775	5760
Total postgraduate research	27,980	29,540	29,865	29,575	29,190
Masters taught	140,615	146,470	146,180	147,120	168,445
Postgraduate certificate in education	23,810	25,200	24,440	23,325	21,705
Other postgraduate taught	10,755	10,670	9325	10,930	10,960
Total postgraduate taught	175,175	182,340	179,940	181,375	201,105
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First degree	433,135	467,860	480,505	495,265	503,830
Foundation degree	14,780	14,370	13,760	11,335	12,515
HNC/HND	5080	5705	5700	5325	4970
Professional graduate certificate in education	1550	1365	1080	975	850
Other undergraduate	11,725	12,930	12,250	12,585	13,020
Total other undergraduate	33,135	34,370	32,790	30,225	31,355
Total all levels	669,425	714,105	723,100	736,435	765,480

Table 8. Higher education student enrolments by level of study—first year/part time.

Level of Study	2012/13	2013/14	2014/15	2015/16	2016/17
Postgraduate					
Doctorate research	4970	4975	4735	4615	4670
Other postgraduate research	1625	1730	1720	1790	1475
Total postgraduate research	6590	6705	6450	6405	6145
Masters taught	44,090	45,450	44,155	43,380	48,700
Postgraduate certificate in education	1670	1315	1040	1095	855
Other postgraduate taught	50,540	52,795	56,305	56,240	58,320
Total postgraduate taught	96,300	99,555	101,500	100,715	107,880
Undergraduate					
First degree	62,195	54,130	46,385	47,310	44,590
Foundation degree	9630	8835	7260	6490	5275
HNC/HND	3815	4005	3825	4110	3590
Professional graduate certificate in education	1140	770	600	585	455
Other undergraduate	123,165	107,640	99,765	90,075	80,065
Total other undergraduate	137,745	121,245	111,450	101,260	89,390
Total all levels	302,830	281,635	265,785	255,690	248,000

Table 9 is indicative of the number of dropouts or non-continuations after enrolling into full-time courses at higher education institutions among young undergraduates. Figures 3 and 4 are derived

from Table 9. It was found that during the period 2016–2017 there were a total of 324,530 full-time students who enrolled in higher education institutions in the UK as compared to 320,520 during the period 2015–2016. It was found that during the period 2016–2017, there were around 86,820 full-time enrolments in higher education institutes in the UK as compared to 84,740 during the period 2015–2016 for full-time mature undergraduate students. Therefore, we accepted the following Hypothesis 4b.

Table 9. Non-continuation following the year of entry among full-time young and mature undergraduate entrants.

HE Provider.	Young				Mature			
	2015–2016		2016–2017		2015–2016		2016–2017	
	Total Full-Time Entrants	Number No Longer in HE (%)	Total Full-Time Entrants	Number No Longer in HE (%)	Total Full-Time Entrants	Number No Longer in HE (%)	Total Full-Time Entrants	Number No Longer in HE (%)
Total England	271,925	17,520 [6.4]	274,410	17,400 [6.3]	69,855	8260 [11.8]	72,060	8805 [12.2]
Total Northern Ireland	6780	310 [4.6]	7275	425 [5.9]	1970	135 [6.9]	2015	165 [8.2]
Total Scotland	25,490	1580 [6.2]	25,890	1510 [5.8]	8455	975 [11.5]	8250	890 [10.8]
Total Wales	16,325	970 [5.9]	16,955	955 [5.6]	4465	490 [10.9]	4495	500 [11.2]
Total UK	320,520	20,380 [6.4]	324,530	20,295 [6.3]	84,740	9860 [11.6]	86,820	10,365 [11.9]

$p = 0.004$; total UK $p < 0.001$.

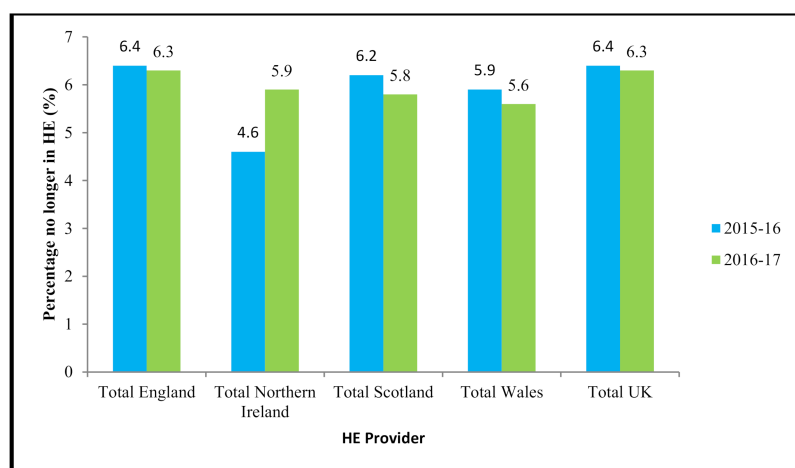


Figure 3. Non-continuation year of entry among young full-time undergraduate entrants.

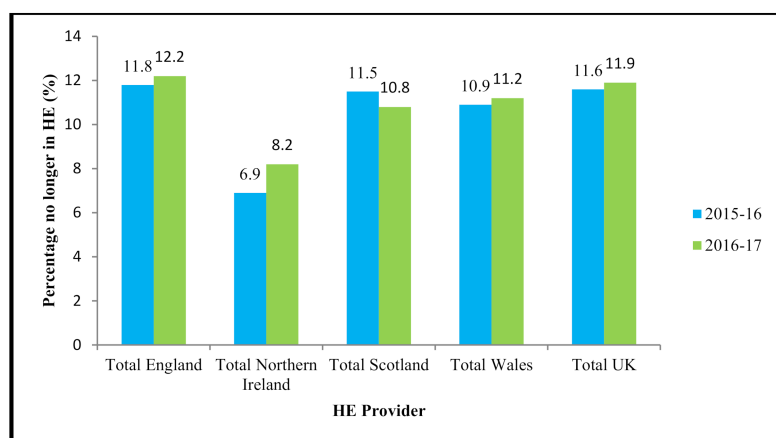


Figure 4. Non-continuation year of entry among mature full-time undergraduate entrants.

Table 10 reveals the non-continuation following year of entry for part-time students aged under 30. Figures 5 and 6 are visualizations of Table 10. During the period 2015–2016, there were 19,650 full-time entrants in the UK as compared to 17,895 during the period 2014–2015. In the group “aged over 30”, the non-continuation year of entry among full-time entrants was higher during the period 2015–2016 as compared to during the period 2014–2015. Hence, we accepted the following Hypothesis 4a.

Table 10. Non-continuation following year of entry among part-time first-degree entrants aged 30 and under vs. aged over 30.

HE Provider	Aged 30 and Under				Aged Over 30			
	2015–2016		2014–2015		2015–2016		2014–2015	
	Total Part-Time Entrants	Number No Longer in HE (%)	Total Part-Time Entrants	Number No Longer in HE (%)	Total Part-Time Entrants	Number No Longer in HE (%)	Total Part-Time Entrants	Number No Longer in HE (%)
Total England	15,725	5580 [35.5]	14,280	4705 [33.0]	11,445	3695 [32.3]	11,030	3455 [31.3]
Total Northern Ireland	1005	460 [45.6]	700	240 [34.3]	565	225 [40.2]	575	220 [38.5]
Total Scotland	2030	740 [36.6]	1865	720 [38.7]	2260	830 [36.7]	2080	755 [36.2]
Total Wales	890	360 [40.8]	1055	455 [43.4]	830	280 [33.4]	915	345 [37.5]
Total UK	19,650	7145 [36.4]	17,895	6125 [34.2]	15,100	5030 [33.3]	14,600	4775 [32.7]

All countries comparison: $p < 0.0001$; total UK: $p < 0.05$.

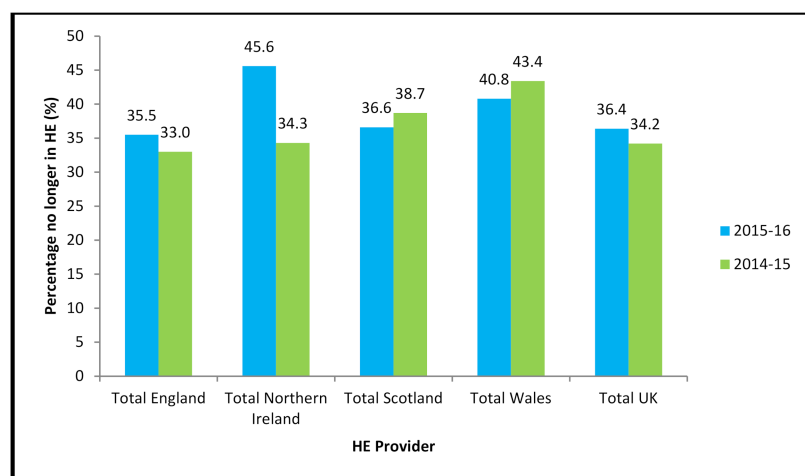


Figure 5. Non-continuation the year following entry among part-time first-degree entrants aged 30 and under.

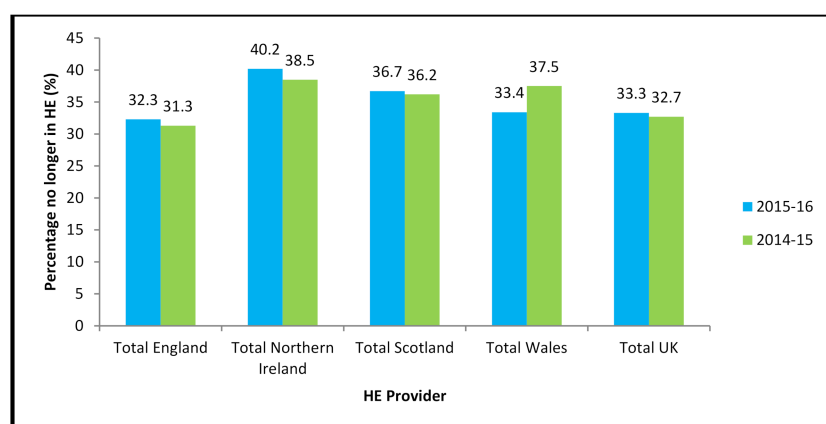


Figure 6. Non-continuation the year following entry among part-time first-degree entrants aged over 30.

5. Discussion

The study results revealed that there is a significant decrease in enrolment among undergraduate students while an increasing trend was observed among postgraduate, full-time and part-time, and first-year students. The findings presented through this paper were supported by a wide range of sector, regional and institutional reports [31,34]. The outcome of this research was segregated and presented under two key student categories viz.: young full-time entrants and mature students. From the analysis, it is evident that during the period 2016–2017 there were around 765,480 student enrolments within every level as compared to 736,435 during the period 2015–2016, 723,100 during the period 2014–2015, 713,105 during the period 2013 and 699,425 during the period 2012–2013.

Furthermore, in this study, the correlation analysis revealed that there was a relationship between non-continuation and entry grades for full-time and part-time, young and mature undergraduate entrants. The data evidently demonstrate that there is a positive correlation between dropouts and entry grades. For instance, students who have entered higher education with more than 481 UCAS tariff points have been observed to have a rate of attrition below 2%. On the other hand, students who enter higher education with around 250 UCAS tariff points are three times more likely to drop out from their courses, with their attrition rate being 6%. Moreover, students who enter higher education with less than 100 tariff points are six times more likely to drop out with a 12% attrition rate. The findings are consistent during the said five-year period. Studies also agreed that there is an association between entry grades and success in higher education [26].

The trend in young students vs. that within mature students appears to be somewhat similar to the percentage of dropouts annually over a five-year period. This rate of dropouts seems to be quite irregular for mature students. The figures pertaining to the rate of dropouts amongst mature students is indicative of the fact that the effect of their previous qualification with regards to retention has comparatively low significance. For students who have been categorized as mature, diverse tariff point groups pertinent to attrition are substantially higher and less consistent on a year-to-year basis in comparison with the group of students categorized as young. In addition, a greater percentage of mature students has been found to drop-out from higher education courses, which is indicative of the fact that within higher education, there are certainly specific challenges that mature students have to face. These challenges are in no way associated with their entry grades.

Therefore, even though it has been observed that entry grades do impact the drop-out rates for young as well as mature students, there are other factors at play that are known to impact the association between previous academic qualifications and attrition for the two categories of students. It is possible to relate such issues with best practices amongst students, social integration, homesickness etc., for young students and aspects like work-related training, previous work experience, family and several other aspects for mature students. The said two categories of students could also be influenced by factors related to managing a heavy workload, financial challenges, and support in tutoring, amongst several others [35,36]. Thus, innovations in learning are mandatory in order to retain the students in higher education. Integrating innovative practices does not only alter conventional activities of higher education institutes, but also grant innovative ways of doing traditional things that act more competently in response to altering necessities in higher education. There is a need to foster an institutional culture of innovation among higher education institutes, which in turn will improve creativities and create awareness of the remuneration resultant from the accomplishment of the innovation. This also minimizes the resistance to change and motivates openness to innovation. The pursuit of enhancing retention rates of higher education students with the help of innovative practices related to technology will be beneficial for both students and higher education institutes alike. The current research aims at promoting a culture of open innovation dynamics. The implications of this research paper invite policy makers and educators to design innovative ways of retention to enhance and strengthen students' enrollment. This research also advises the world of academia to engage in constructing concierge approaches to support students' retentions, which can enhance the search for external knowledge.

The concept of open innovation, which was once associated only with industrial practice, has recently acquired strong relevance to academic research. It invites policy makers to critically reflect upon their educational practices from the perspectives of improvement using entrepreneurial mindsets. It invites key stakeholders to use digital transformation to find solutions for the challenges faced in the context of education.

This paper focuses on students' retention at undergraduate and postgraduate levels, a pertinent challenge in the field of education, and is furthermore strongly connected with open innovation. It is significant to see the connections between the issues of retention with the models used in the industrial world. The popular model of Lean startup methodology [37] in entrepreneurial mindset can easily be applied in the world of education. Lean startup is based on the philosophy of 'build, learn and measure'. The mantra is built on the 'minimum viable product' which heavily emphasizes constant experimentation and multiple iteration. Similarly, innovation in building a sustainable model of retention in universities should be based on an investigative development method. When the process of measuring and learning is completed effectively, it will indicate to policy makers whether the approach adds value to the institution or, if not, will drive these policy makers to implement structural course correction processes to test a new fundamental hypothesis about the product, strategy and engine of growth.

6. Conclusions

This study has concluded that there is a relationship between entry grades and the non-continuation of full-time and part-time, young and mature undergraduate entrants. On the basis of the literature review and from the findings of the present study, it is noted that students with higher entry grades are well prepared, do not face extensive challenges in terms of academics and hence, there is little scope for them to drop out. Though the focus of this study was on student retention on the basis of investigating the association between entry grades and trends of attrition, with the consistent execution of the expanding participation agenda, challenges within the economy and increment in the level of fees, the number of students who are non-traditional in terms of their entry grades and backgrounds and previous qualifications are supposed to witness an increment.

To tackle the challenge of dropouts from higher education institutions, it is imperative that contemporary institutes of higher education are more flexible and emerge as institutions that evolve quickly. Integrating new students through induction programs is also of much significance and can help students to make a positive start. Tutoring students and monitoring their attendance regularly is also of significance. Issues related to family and financial challenges also tend to play a substantial role in influencing students to arrive at drop-out decisions. Therefore, higher education institutions need to appropriately invest in robust systems of support which would also comprise of providing qualified teachers, appropriate tutoring and networks offering peer support.

This particular study is limited to the data obtained from secondary sources, which focused largely on full-time and part-time students and primarily revolved around UCAS tariff points for UK higher education institutes. Thus, future researchers can conduct a quantitative study in other countries. Furthermore, this study has focused only on the relationship between drop-out rates and entry grades in UK higher education. Thus, future studies can focus on examining the relationship between staff–student ratio and student retention in HE.

7. Implications of the Study

The study findings provide both theoretical and practical contributions. From the theoretical perspective, the outcome of this study would provide valuable insights to aid student retention in higher education and areas for future exploration.

On the basis of these findings, it is possible to present several solutions that are practical and those that facilitate higher retention rates. The personal situations of students is a factor that needs to be focused upon when structuring activities for retention. For instance, both young and mature

students might be facing financial challenges which eventually lead to dropouts. It has been indicated by [9] that young students are seldom aware of the actual cost of a life which is autonomous and when confronted with financial challenges, tend to drop-out and seek opportunities for employment. Mature students, on the other hand, are challenged with other personal situations, and those situations might influence them to drop out.

In addition, higher education institutes providing effective personal tutoring can also be highly beneficial. In order to positively impact student retention, higher education institutions must proactively facilitate the scheduling of personal tutor meetings during the first semester. There is also a need to maintain equilibrium with activities for retention while taking into account individual situations. Strong and robust support should be provided for participation, while instances where students do not attend should be investigated and followed up. Therefore, it is imperative that higher educational institutions extend increased support and feasible options to cater to the requirements of students. This study recommends higher education providers in the UK to reduce barriers with the aim of offering access to higher education to a larger number of students. This particularly refers to students who belong to underprivileged backgrounds; subsequently, the results following their entry were not cared for. This tended to directly make an impact on retention and also increased the number of dropouts. In addition, offering seats in higher education to students who are said to be financially weak also tends to be taxing on the support system of the university.

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