

Variables predicting the odds of failing to progress onto the second year of study for criminology students in a UK university

Abstract

Globally, statistical analyses have found a range of variables that predict the odds of first-year students failing to progress at their Higher Education Institution (HEI). Some of these studies have included students from a range of disciplines. Yet despite the rise in the number of criminology students in HEIs in the UK, little statistical research has been carried out on this cohort. This paper reports on survey data gathered from three consecutive cohorts of first year undergraduate Criminology students (n=165) enrolled at a university in the North of England from 2014 to 2017. Twenty-five per cent (n=42) of these students did not progress onto the second year of their programme. Binary logistic regression was carried-out to identify variables that predict the odds of students failing to progress beyond their first year on their programme of study at their HEI. Results show that three variables positively indicated students failing to progress: i) moving to study at their HEI, ii) thinking about dropping out towards the end of their first year, and iii) being referred in assessments throughout the year (i.e., having to do assessments again because of grading below the pass-mark or non-submission). These findings can be used by HEIs to identify ‘at risk’ students to implement safety nets of support throughout the *whole* of the students first year at university to decrease the odds of students not progressing with their programme of study beyond their first year.

Keywords: retention in higher education, first year criminology students, logistic regression, predictor variables, social and academic integration

Introduction

On 7th March 2019, the education secretary warned universities to address the high rates of students dropping out of universities. Of full-time entrants to a first degree, 7.6% were not in English HEIs the following year. The publication was damning because it accused universities of wanting “‘bums on seats’” rather than aiming to support students throughout their programme of study (GOV.UK, 2019, unpaginated). More recently, the Office for Students have threatened universities with a ranking system if they do not meet the standards for the number of students completing their degree (Woolcock, 2022). The government publishes figures of non-continuation rates per HEI (HESA, 2019). These drop-out rates are a key metric that influences the positioning of universities in the league tables (see The Guardian, 2020; The Sunday Times, 2020). Consequently, HEIs who repeatedly lose students can have their reputation damaged (Crosling et al. 2009; Hixenbaugh et al. 2012; O’Keefe, 2013). There are other reasons why the government and regulatory bodies warn universities about student drop-out rates. While there are financial implications for students, their families and HEIs, there are costs to the economy (Crosling et al. 2009). The US president, at the time, had stated that the fall in rates of young people with college degrees ‘represents a threat to our position as the world’s leading economy’ (American Institutes for Research, 2010, p.1). In a similar vein, in the UK, the government collects higher taxes from graduates, estimated at 11% more than the cost of the university education provided. Subsequently, the life-chances of young people who drop out from higher education (HE) are significantly reduced as graduates earn more than non-graduates: over £100,000 more over a working-life (Hixenbaugh et al. 2012). Set against this macro and micro context of the reasons for retaining students in HEIs, this paper begins by reviewing the statistical research that identifies models and factors related to the attrition of students with a particular focus on disciplines studied to open-up the gap for the research written-up in this paper. The methods of research follow, outlining the data collection and detailing the analysis of the data. The results are then presented, firstly, showing the individual variables significantly

related to outcomes at the end of the first year in HE, and secondly, the regression model with variables predicting failing to progress onto the second year of study. It is important to define what this study means by ‘failing to progress’ because of the implications this has for the institutions’ policies and practices moving forward (see Tinto, 1975). Failing to progress is defined, for the purposes of this research: a student who does not ‘pass and proceed’ onto their second year of the undergraduate Criminology programme at the HEI. While this may seem a narrow definition of student drop-out because it counts those who have gained a Certificate of HE award or transferred internally (see Tinto, 1975), the central focus on students ‘failing to progress’ on the programme is of utmost importance to academics and managers responsible for the programme. Criminology programmes at UK universities have proliferated in recent times: over 800 undergraduate programmes *involve* Criminology in the UK (Levi, 2017). Given the marketised nature of HE, where institutions are competing for students, the loss of students is costly (Maisuria and Cole, 2017): it could lead to closure of programmes. Importantly then, the discussion makes sense of the results, drawing on a social integration model of retaining students. The implications of this for HEIs are outlined in the conclusion.

Models and factors related to attrition of students studying different disciplines

There have been many statistical studies carried out on the retention of first year students at university. At a macro level, social models of understanding why students drop out of HE (Behr et al. 2020) are thought important. Within such a model, Tinto (1975, p.94) writes about ‘a longitudinal model of dropout’ where dropping out is viewed as a process. Integral to this model are micro level factors: individual’s attributes (e.g., gender, ethnicity) and their previous educational experiences (e.g., attainment, family backgrounds), because they influence the student’s expectations/goals about education and the ensuing commitment to the institution. These

in turn impact upon the extent to which the student is academically integrated into the subject and institution, and socially integrated with peers and the HE community. Failing to integrate into the university environment academically and socially can lead to students dropping out (Tinto, 1993). Tinto (1975) recognises the influence of external factors upon student's commitment to education and the institution, such as a demise in available jobs in the field may reduce an individual's commitment levels, and thus lead to the student dropping out. Yet a lack of available external opportunities and activities may lead students to stay in HE. Applying this macro level model to tease out micro level factors, Chrysikos et al.'s (2017, p.97) statistical modelling of the data gathered from undergraduate computing students in the UK, found Tinto's model of student integration useful albeit it accounted for 'a modest amount of variance in retention'. The largest effect on retention were students' initial goals and their institutional commitments, which were significantly related to their parents' high levels of formal education. Students whose levels of initial commitments were high, were predicted to have high levels of commitment later. Consequently, they were more likely to have high levels of social and academic integration and thus more likely to be retained. The study also confirmed that other positive predictors of students' persistence at university were interacting with staff, developing relationships with staff and students, and a negative predictor was missing classes. García-Ros et al.'s (2019, p. 915) statistical analysis of the data from 243 first year engineering students in Spain also showed that institutional commitment and academic achievement during the first year were 'the best predictors of student retention'.

Behr et al.'s (2020) review of the literature suggests that different disciplines have varying drop-out rates, for example, 'very few students drop out' from the social sciences (Heublein et al. 2017 cited in Behr et al. 2020, p. 628; see also GOV.UK, 2019). Statistical research has been carried out

on the retention of students from a range of disciplines: occupational therapy (Boehm et al. 2017), engineering (Garcia-Ros et al. 2019), computing (Chrysikos et al. 2017), nursing (Wray et al. 2014), and medicine (Arulampalam et al. 2004). In the latter study, Arulampalam et al. (2004) carried out logistic regression on UK students in 21 medical schools from 1980-1992. They found that A-level subjects studied, and associated scores attained significantly influenced the probability of students dropping out during their first year. Achieving a high grade in biology, physics or chemistry reduced the probability of students dropping out. The study also found that for the students (almost 80%) who lived on campus in accommodation had, on average, lower drop-out rates. Students living off campus had around 40% higher probability of dropping out compared to students who lived on campus. Other research has found that students who attended a college (in the US) further away from their home, are more likely to transfer to another institution closer to home, and thus have lower retention rates, compared to students who lived nearer to the college (ACT, 2017). In Wray et al.'s (2014, p.1700) survey of university nursing students in the north of England, they found that over half (53%, n=102) said they had considered leaving. In other survey research with 54 occupational therapy university students in Australia, a quarter had said they had considered leaving during their first year on the course (Boehm et al. 2017). Yet little statistical research has been carried out on criminology students - surprising given the rise in the number of criminology students in HEIs in the UK (Trebilcock and Griffiths, 2021). This was the rationale for the research presented in this paper.

Method

Participants

There were three consecutive cohorts of first-year students (n=165) in the study from 2014 - 2017: 56 students in 2014/2015, 65 in 2015/16 and 44 in 2016/17. They were predominantly female

(n=123, 75%), White British (n=138, 85%), non-disabled (n=155, 99%), heterosexual (n=145, 94%), were likely to define themselves as working class (n=124, 82%), and were likely to be young, with a modal age of 18 and 88% between the ages 18 – 24. Table 1 outlines these socio-demographics of the student cohort.

[Table 1 near here]

Materials

The study progressed through the ethics procedure at the university and was subsequently approved, and informed consent to take part in the study was obtained from students. Given the theoretical model of student retention advanced by Tinto (1975, p.99, 1993) about the influence of students' commitment to education and the institution upon their academic and social integration, the methods of research needed to be able to gather data about 'the simultaneous interaction between the individual and the institution'. In terms of the *individual*, family background, individual attributes and their previous educational experiences are thought to influence students' commitment to education and the institution, and ultimately, how well they academically and socially integrate into the HE community. Consequently, at the start of their programme of study, using a survey (survey 1), students were asked about their A-levels and type of further education including UCAS points gained, whether they gained entry onto the programme through clearing, if they had studied criminology before, and whether their family, friends or close relatives were at, or had been, at university. In terms of their *social* backgrounds, students were also asked whether they had moved to study at the university, who they lived with, type of property (e.g., rented, mortgaged) lived in, whether they had close family and friends in the local area, were in a

relationship, had dependants, were working, volunteering, undertaking other training, had transport, or health problems. Students could provide open responses about their motivations for studying criminology and what they hoped to do after graduating from university. Socio-demographic data was also gathered on this survey (e.g., gender, ethnicity, disabled, sexuality, social class, age). This survey served as a baseline to ascertain individual attributes and social backgrounds of students at the start of their programme of study.

Given that Tinto's (1975) theoretical model of student retention is best viewed as a longitudinal process, and as such, 'longitudinal survey data are of considerable importance' (Behr et al. 2020, p.635; Chrysikos et al. 2017) for examining student drop-out, six weeks into their programme (i.e., mid-semester one), and at the start of their semester two (5-6 months into the programme), students were given another survey identical at these two time-points (surveys 2 and 3). On this survey, they were asked about how many friends they had at university. 'Peer-group associations' are linked to how well an individual integrates socially (Tinto, 1975, p.110). They were also asked if they had missed classes and why, and if they had thought about dropping out of university. Following this, they were asked open questions about why and what prevented them from dropping out of university. Towards the end of semester two and their first year of study (7-8 months into the programme), on a final survey (survey 4), students were asked the same questions again about missing classes, dropping out of university and about how many friends they had at university. They were also asked an open question about what they hoped to do after graduating from university. In addition, focus groups and exit interviews were carried out with some students during their first year to examine how students settled into studying criminology. While this paper will draw on findings from the qualitative data to contextualise the statistical findings, due to reasons

of space, a fuller presentation of the qualitative data can be found in another paper (Williams and Roberts, 2022).

In terms of the individual's interaction with the institution – thought important in understanding levels of commitment to education, the institution, and ultimately their integration (Tinto, 1975), institutional data about the students in the sample was gathered. This included: their educational qualifications and UCAS points used to gain entry to the programme, levels of attendance, whether they were referred (i.e., having to do assessments again because of grading below the pass-mark or non-submission), deferred and had non-submissions in their assessments, and their status in terms of progression at the end of their first year.

Design and procedure

The three student cohorts were tracked throughout their programme of study, which was 3 years in duration, to gather data about their long-term outcomes in HE, albeit this paper focuses on the first-year experience. Table 2 provides an overview of the research methods used to gather data during students' first year of study.

[Table 2 near here]

The surveys were hard copy. They were completed by students who opted to do so during their induction to the programme and subsequently during their lectures and/or classes. A small number of students, who were hard-to-reach due to their attendance, completed the surveys electronically

using Survey Monkey (for further details about the focus groups and exit interviews see Williams and Roberts, 2022). The total numbers of students who completed the surveys are as follows: 164 at the start of the programme, 155 mid-semester 1, 139 at the start of semester 2 and 138 at the end semester 2.¹ Binary logistic regression was carried-out to identify variables that predict the odds of students failing to progress beyond their first year on their programme of study, as the next section details.

Analysing the data

The data from the surveys, attendance, referred, deferred, non-submissions and progression, were entered in a SPSS dataset. The entries were checked for accuracy and cleaned. The purpose of the data analysis was to find variables, from the data gathered, that predict the odds of students failing to progress onto their second year of the criminology programme at their HEI. “Odds” refers to the probability of occurrence of an event’ (Ranganathan et al. 2015, p.1). Consequently, the data was analysed using binary logistic regression. It is an ‘established method’ in retention studies because ‘it handles both categorical and continuous predictor variables’ (Herzog, 2005, p.889). Most of the predictor variables in this study are categorical - yes (coded 0) / no (coded 1) (e.g., moved to study at the university, thinking about dropping out of university, referred in assessments), with the reference category as the last, i.e., no – does not have the risk factor (see Warner, 2013). Some variables were continuous (e.g., UCAS points, attendance). Such data were tested for extreme outliers then entered into the binary logistic regression as single variables to test their significance, and thus, worthiness to be considered for entry into the overall regression analysis.

¹ These figures do not denote drop-out rates but completion rates of the survey at the different time-points. For example, some students completed the survey at the end of semester 2 but they did not complete it at the start of semester 2.

Unlike linear regression, where assumptions of normality, linearity, homogeneity of variance and homoscedasticity are important, in binary logistic regression, they are not, because of the binary outcome variables in such a regression analysis (Warner, 2013). In this research, the outcome variables are ‘pass and proceed’ (coded 0 - the positive outcome) and ‘other’, e.g., required to withdraw, voluntary withdrawal, internal transfer (coded 1 - the negative outcome and the target group, Warner, 2013). All categorical binary predictor variables were cross tabulated with the outcome variables to ascertain which variables would be considered for entry into the regression analysis (see Herzog, 2005; Paterson, 2017; Ranganathan et al. 2017). Variables with $p < 0.10$ were considered, as a ‘less stringent p-value’ should be used to prevent excluding potentially important variables (Stoltzfus, 2011, p.5; Ranganathan et al. 2017) *and* variables where cells do not have expected frequencies less than 5 (Warner, 2013; Herzog, 2005), were considered for entry into the regression analysis.

Eighteen variables were found to be significantly related to a ‘pass and proceed or ‘other’ outcome. These included: moved to study at the university ($p=0.011$), having children/dependants ($p=0.038$), close family in local area ($p=0.014$), thinking about dropping out of university (survey 2 $p=0.026$, survey 4 $p=0.001$), referred in assessments (semester 1 $p=0.001$, semester 2 $p=0.001$, over the year $p=0.001$), non-submission of assessments (semester 1 $p=0.001$, semester 2 $p=0.001$, over the year $p=0.001$), missing classes due to illness (survey 2, $p=0.003$) and family problems (survey 2, $p=0.021$, survey 3, $p=0.037$), and not missing classes (survey 2, $p=0.016$). Attendance data was found to be significant (semester 1 $p=0.041$, semester 2 $p=0.001$, over the year $p=0.002$), in predicting the odds of failing to progress onto the second year of study. Table 3 summarises these results.

A problem, which reduced the availability of predictor variables that could be entered into the regression analysis, was the repeated measures of some of the variables, such as referred in assessments at either semester 1 or semester 2, would have been a sub-set of referred in assessments over the year. Therefore, this violates the assumption of the independence of errors (Stoltzfus, 2001). Consequently, 'referred in assessments in semester 1' and 'referred in assessments in semester 2' could not be entered into the model at the same time as 'referred in assessments over the year'. This is the same with the 3 'non-submission of assessments' variables and the 3 'attendance' variables. It may also be the case with the variables 'thinking about dropping out of university' and 'missing seminar classes due to family problems'.

The variables with the lowest p value (i.e., attendance in semester 2, thinking about dropping out of university survey 4, missing seminar classes due to family problems survey 2) were entered into the regression analysis. As the 'referred in assessments' variables had the same p values, the variable 'over the year' was entered into the analysis. Furthermore, given the nature of some of the categorical variables and the potential of confounding variables, cross-tabulations on nominal data using Phi, were used to test whether they were associated with one another. If predictor variables interact with one another, it is unclear which one is contributing to the outcome variable (see Ranganathan et al. 2017). Three variables were found to interact with one another and the variable with the lowest p value was entered into the regression analysis: the other two were not entered. The variable 'non-submission of assessments' were not entered into the analysis because 'referred in assessments' and 'non-submission of assessments' were positively associated with one another (Phi=0.816, p=0.001). 'Moving to study at the university' and 'close family in the area' were negatively associated with one another (Phi=-0.557, p=0.001) and 'moving to study at the

university' and 'having children/dependants' were also negatively associated with one another (Phi=-0.215, p=0.006). As 'moving to study at the university' had the lowest p value, this was entered into the binary logistic regression (see Ranganathan et al. 2017). Table 3 identifies significant variables with those in italics (n=7) entered into the regression analysis.

[Table 3 near here]

A combined method was used to enter variables into the regression analysis. Firstly, the enter method was used in SPSS, i.e., the direct approach, where all 7 predictor variables were entered into the analysis simultaneously. This method was chosen because it is not clear which of the variables 'have greater importance than others' (Stoltzfus, 2011, p.7). Secondly, the hierarchical method was used, entering the variables with the lowest p values into the blocks first, second, third, fourth and removing non-significant predictor variables, re-running the analysis each time, until the model was significant.

Results

Descriptive statistics: attributes/backgrounds, qualifications/entry route and outcomes in HE

The results reported here are the descriptive statistics of attributes/backgrounds of students, their qualifications/entry route into HE at the start of the programme and their outcomes in HE at the end of the first year. It is important to present these first to situate the key predictor variables that strongest predict the odds of failing to progress onto the second year of study, which are presented in the next section.

In terms of the key attributes and backgrounds of students, almost a third of the cohort had moved to study at the university (n=52, 32%). Some of the students had studied criminology before (n=13, 8%). They were more likely to have close friends (n=84, 51%) and close relatives (n=58, 35%), than siblings (n=47, 29%) and parents (n=19, 12%) having attended and/or attending university. Some of the students had dependants (children/other carer responsibilities) (n=29, 18%), almost half were working part-time (n=81, 49%), much less full-time (n=3, 2%), and some students engaged in volunteer work (n=12, 7%) and other training (n=3, 2%). Some students had their own transport (n=53, 32%), and ongoing health problems (n=15, 9%). Students were more likely to have close friends (n=121, 75%) in the local area compared to close family (n=98, 60%). More of the students lived in rented accommodation (n=89, 67%), compared to mortgaged (n=40, 30%) and owning (n= 3, 3%) their property. Yet more students were living with parents/relatives (n=78, 53%), than with friends (n=33, 23%), on their own (n=20, 14%), and with a spouse/partner (n=15, 10). Table 4 details these key attributes and backgrounds of students at the start of the programme.

[Table 4 near here]

In a similar vein, Table 5 details students' qualifications and entry route onto the programme. Almost half of students entered HE via a non-traditional route (n=77, 49%), compared to a traditional route of A/AS levels (n=56, 35%). The modal UCAS points was 240 with a mean of 282 and a median of 275. A small fraction of students came through clearing (n=25, 16%) and internal transfer (n=23, 14%), compared to most students entering university in the traditional way (n=111, 70%).

[Table 5 near here]

All the factors in Tables 3-5 were considered potential variables that predicted the odds of students failing to progress onto their second year (Table 3 details the significant factors). Table 6 details students' outcomes at the end of stage 1 (first year).

[Table 6 near here]

At stage 1, 123 (75%) students progressed onto stage 2, their second year of study: 42 (25%) students did not. The odds of failing to progress onto the second year of the programme are greater than 1 in 3 because 42 students did not progress onto their second year whereas 123 students did. The purpose of regression analysis is to identify variables that predict the odds of students failing to progress onto their second year of study.

A model of predictor variables in students failing to progress

All 7 variables, highlighted by italics on Table 3, were entered into the regression analysis simultaneously. Then a hierarchical method was adopted. Three variables were removed in the next step of the analysis because of high non-significant p values (missing seminar classes due to illness survey 2, missing seminar classes due to family problems survey 2, not missing seminar classes survey 2) and the analysis re-ran. The variable attendance in semester 2 was removed in the next

step because of its high non-significant p value and the analysis re-ran. Three significant predictor variables remained in the regression model.

Table 7 shows the results of the binary logistic regression. Three predictor variables: moved to study at the university, referred in assessments over the year, and thinking about dropping out of university survey 4, formed a model that predicted the odds of students failing to progress onto the second year of their study. In the model, 117 students, who passed and proceeded, and 19 students, who failed to progress, were included in the analysis. There were 29 missing cases (on the predictor variables). Some research has advocated there should be at least 10 events per variable (EPV) (Peduzzi et al. 1996). Other research has found that less than 10 EPV, e.g., between 5 – 9, showing statistically significant associations, should not lead to results being dismissed (Vittinghoff and McCulloch, 2006). In this research, the logistic regression model could accommodate 3 – 4 predictor variables because 19 (students) is the smallest outcome variable (see Stoltzfus, 2011). This will avoid ‘overfitting’ the final model in the analysis with variables, ‘some of which may be “noise”’, and thus leading to a Type I error, and ‘underfitting’ the final model in the analysis by excluding important variables, and thus leading to a Type II error (Peduzzi et al. 1996, p.1373).

[Table 7 near here]

The regression analysis indicates that referred in assessments over the year, thinking about dropping out of the university towards the end of the first year, and moving to study at the university are significant predictors of failing to progress onto the second year of an undergraduate Criminology programme (Chi-Square=27.462, df=3 and p=0.001). All three predictors explain

33% (Nagelkerke R²) of the variance in students failing to progress onto their second year. Referred in assessments over the year, thinking about dropping out of the university towards the end of the first year, and moving to study at the university are significant at the 5% level (*referred in assessments* Wald=9.276, p=0.002; *thinking about dropping out* Wald=8.443, p=0.004; *moved to study* Wald=5.152, p=0.023). The odds ratio for: *referred in assessments* is 5.903 (95% CI 1.883 – 18.503); *thinking about dropping out* is 5.453 (95% CI 1.737 – 17.121); and *moved to study* is 3.699 (95% CI 1.195 – 11.445). The model correctly predicted 99.1% of cases of pass and proceed and 21.1% of cases failing to progress, giving an overall percentage of correct prediction rate of 88.2%. The model was a good fit (Hosmer and Lemeshow Chi-square=0.490, df=4 and p=0.974, p>0.05) (see Warner, 2013). In summary, the odds of failing to progress onto the second year of study were: 3.7 times higher for students who had moved to study at the university; 5.9 times higher for students who had been referred in assessments over the year; and 5.5 times higher for students who had thought about dropping out of the university towards the end of their first year of study, compared to students who passed and proceeded onto their second year of study.

Discussion

Contrary to other studies, this study has found that background factors such as: students' educational qualifications, studying criminology before, routes into HE, whether their parents, siblings, close relatives and close friends had attended or were attending university, whether they had friends at university, and; students' demographics such as gender, ethnicity, disabled, sexuality, social class, age, were *not* related to their outcomes in terms of pass and proceeding or failing to progress onto their second-year of study. Working part-time or full-time, volunteer work or other training, having their own transport, ongoing health problems, close friends in the local area, who they lived with and the property they lived in, were also *not* related to students' outcomes in HE at

stage 1. These findings must be read in the context of the limitations of the study and the small sample size, which may have led to a Type II error, thereby effecting the results. This may have been the case in this research when identifying significant variables to predict the odds of students failing to progress onto their second year of study because the number of students completing the surveys declined over the course of the first year. Further research with larger samples of cohorts of undergraduate Criminology students across different HEIs, would add to the analysis.

The variables which were found to predict students failing to progress onto their second year of study were: moving to study at the university, referred in assessments over the year, and thinking about dropping out of the university towards the end of the first year. The strongest predictor, being referred in assessments indicates students who did not pass the assessment because of grading below the pass-mark, *or* the assessment had not been submitted (hence why this variable was associated with the variable non-submission of assessments). Students' failure to achieve academically is linked to their lack of institutional commitment, which is important in retaining students because students with higher levels of institutional commitment are more likely to be academically and socially integrated into the HE community (Chrysikos et al. 2017; García-Ros et al. 2019). This is not about students not possessing the academic ability to succeed in HE. The evidence that supports this claim comes from three sources in this study. Firstly, students' educational qualifications and entry route into HE was *not* related to students failing to progress onto their second year of study. Secondly, not missing classes and good attendance, like in other research (Chrysikos et al. 2017), were generally more likely to be related to pass and proceeding onto the second year of study. Thirdly, students who were thinking about dropping out of university towards the end of their first year are likely to have disengaged over the course of the year. This is strengthened by evidence found in this study that students who were not thinking about dropping

out of university mid-way through semester one (i.e., survey 2) was related (in a cross-tabulation, $p=0.026$) to pass and proceeding onto the second year.

The second strongest predictor in the model, thinking about dropping out of university survey 4, was entered into the regression analysis because of its lower p value compared to thinking about dropping out of university survey 2 (see Table 3), and in doing so, it strengthened the overall model. So, there is evidence in this study that student disengagement leads to a negative outcome of failing to proceed beyond the first year of study. Existing research has shown that students' interaction with the institution, through engagement, is important in understanding levels of commitment to the institution and subsequently integration into the academic and social community (Tinto, 1975). Drawing on the key findings from the qualitative data, which are fully presented in another paper (Williams and Roberts, 2022), students were buffered from dropping out of their undergraduate Criminology programme because they were interested in the subject, and they were highly motivated to get a degree to better themselves *vis-à-vis* enhancing their career opportunities. This is supported by students' reasons given for choosing to study criminology and why they did not drop out because of interest and/or future aspirations. These motivations facilitated students' continued engagement in their programme of study. Therefore, the subject of criminology was a protective factor guarding against students dropping out. However, some students did drop out: 42 (25%) of the cohort. This study can lend some support to why students disengaged.

The evidence for this is found in the third variable in the regression model that predicts students failing to progress onto their second year of study of moving to study at the university. Almost one-third of the students ($n=52$, 32%) moved to study at the university. They were 3.7 times more likely not to progress onto their second year of study compared to students who passed and proceeded

onto their second year of study. For students who uproot themselves from their existing familial and social networks and migrate to a different environment, they have fundamental challenges to embed themselves in the social and academic community. Moving away from a known environment to an unknown environment is risky because it threatens students' sense of belonging (Clayton et al. 2009). Drawing on the key findings from the qualitative data (Williams and Roberts, 2022), students struggled to transition to a new identity of 'university student' because of feelings of awkwardness. They felt *physically* awkward by feeling out of place; *academically* awkward by feeling not clever enough, and *socially* awkward by feeling they did not know anyone. For the students who moved away from their homes to study, many retained connections with their existing familial and friendship networks by travelling back home at weekends, because they were homesick, missing their friends and family. This hampered them from settling into their new environment, which was a particularly divisive environment, where most of the students were local, and thus had well-established pre-existing familial and friendship networks. Consequently, the students who moved to study were in a minority in their new environment, which impeded their academic and social integration in that environment. These is further evidence from the statistical findings of the study to support the importance of familial networks in the local environment in facilitating students' integration into the environment. Having close family in the local area, was related (in a cross-tabulation, $p=0.014$) to students passing and proceeding onto their second year of study. The mix of 'home' and 'away' students therefore resulted in disparate and disconnected cohorts of students, which negatively affected the latter students' integration into student life. This study finds then, more broadly, support for Tinto's model of student integration (1975, 1993).

Conclusion

HEIs can use the findings from this research in this paper, to identify students who are at risk of not progressing onto their second year of study, by intervening early, providing safety nets of support, to enhance their progression throughout the programme of study (see ACT, 2017). For example, asking students whether they are thinking about dropping out of university, as other research has done, during students' first year of study (Boehm et al. 2017), is important for HEIs to do given the link between thinking about leaving and failing to progress onto the second year of a programme of study. But this alone is not sufficient to focus upon. Throughout the first year of study, HEIs need to pay careful attention to students who have been referred in assessments, and additional resources need to be targeted towards them to increase the probability that they will engage with the institution, the subject, classes, and assessments, ultimately enhancing their levels of commitment to the institution. As the regression model is tripart, HEIs also need to pay attention to students who have moved to study at the university and careful thought must be given to how institutions facilitate the social integration of these students in a problematic context of local students who mostly reside in the area. The education secretary had created a new taskforce for universities to implement ways of supporting students, particularly by helping them find their 'feet among a large new group of peers' (GOV.UK, 2019, unpaginated). More resources like these should be allocated to help students socially integrate into their new environment, which will in turn, facilitate their academic integration, ultimately increasing the probability of them progressing onto their second year of study. This heightened and targeted intervention of such students must be done early, as soon as students arrive, *before* they disengage. HEIs need to make use of online software systems that synthesises key student information, such as that identified in the predictor variables, to flag students of concern, so that they can be supported, and their life chances enhanced.

Subject specific strategies may be more appropriate in facilitating students' academic and social integration. In programmes, such as criminology, where interest and motivation to study the subject is high to enhance future career prospects to ultimately better life-chances, subject specific strategies that begin as soon as students start their programme of study to maintain their interest and motivation, are recommended. These include: i) guest speakers from relevant professional organisations, in the Criminal Justice System, such as police, probation and prison services and other relevant linked organisations in the third-sector; ii) off-site visits or placements or volunteering opportunities in such organisations; iii) the use of relevant case studies, documentaries, virtual learning environment, embedded in learning and teaching materials, particularly students' assessments; to continually make explicit the links between the study of criminology and students' future career aspirations (Williams and Roberts, 2022). Bates and Hayes (2017, p.145) illustrate how 'a career development component' is embedded in a core first year Criminology Skills course during the transitioning in stage for new students. In it, students view videos of professionals in the field of criminology talk about their careers and receive a guest talk from the University Careers and Employment Services about volunteering opportunities. As the focus is on enhancing students' employability as graduates, keeping them focused on their end goals of HE study should aid with retaining them on their programme of study in the transitioning in stage. Thus, supporting the need for the discipline of criminology to be applied in its learning and teaching methods from the outset. While guest speakers, volunteering opportunities and applied learning and teaching methods have been promoted, to varying extents, *during* the first year of the undergraduate Criminology programme in this study, placement opportunities in relevant organisations for students to experience criminology in practice, were not introduced to students until their second year of study. This is too late for transitioning in students who have disengaged during the first year of their programme and subsequently dropped out. Harnessing students' interest and career-related aspirations in criminology from the outset may help students

forge quickly a ‘criminology student’ identity to feel part of a cohort of criminology students (Williams and Roberts, 2022), and thereby facilitate their academic and social integration, ultimately reducing the odds of them failing to progress onto their second year of study.

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Tables

Table 1. Socio-demographics of students

| Socio-demographics | | n=* | % |
|---------------------------|---------------------------|------------|----------|
| Gender | Female | 123 | 75 |
| | Male | 41 | 25 |
| Ethnicity | White British | 138 | 85 |
| | Black/Asian/Other British | 9 | 5 |
| | White Other | 13 | 8 |
| | Black/Asian/Other | 3 | 2 |
| Disabled | Yes | 2 | 1 |
| | No | 155 | 99 |
| Sexuality | Heterosexual | 145 | 94 |
| | Lesbian | 2 | 1 |
| | Gay | 1 | 1 |
| | Bi-sexual | 6 | 4 |
| Social Class | Working class | 124 | 82 |
| | Middle class | 26 | 17 |
| | Upper class | 2 | 1 |
| Age | Mean | 20 | |
| | Median | 19 | |
| | Mode | 18 | |
| | 18 – 24 | 144 | 88 |

*difference in figures are non-responses

Table 2. Gathering the data

| Type of Data | Start of Programme | Mid- Semester 1 | End of Semester 1 | Start of Semester 2 | End of Semester 2 | End of First Year |
|---|--------------------------|--------------------|-------------------------|---------------------------|----------------------|----------------------------|
| Surveys | X | X | | X | X | |
| Focus Groups | | X | X | X | | |
| Exit Interviews | | X | X | X | X | X |
| Attendance | | | X | | X | X |
| Referred/ Deferred/ Non- submissions | | | X | | X | X |
| Progression | | | | | | X |

Table 3. Significant predictor variables

| Variable | p= | Variable | p= |
|--|--------------|---|--------------|
| <i>Moved to study at the university</i> | <i>0.011</i> | Non-submission of assessments | |
| Having children/dependants | 0.038 | • Semester 1 | 0.001 |
| Close family in local area | 0.014 | • Semester 2 | 0.001 |
| Thinking about dropping out of the university | | • Over the year | 0.001 |
| • Survey 2 | 0.026 | Missing seminar classes due to family problems | |
| • <i>Survey 4</i> | <i>0.001</i> | • <i>Survey 2</i> | <i>0.021</i> |
| Referred in assessments | | • Survey 3 | 0.037 |
| • Semester 1 | 0.001 | Not missing seminar classes | |
| • Semester 2 | 0.001 | • <i>Survey 2</i> | <i>0.016</i> |
| • <i>Over the year</i> | <i>0.001</i> | Attendance | |
| Missing seminar classes due to illness | | • Semester 1 | 0.041 |
| • <i>Survey 2</i> | <i>0.003</i> | • <i>Semester 2</i> | <i>0.001</i> |
| | | • Over the Year | 0.002 |

Table 4. Key attributes and backgrounds of students

| Attributes/backgrounds | | n= | % |
|---|-----------------------------|-----------|----------|
| Moved to study at university | Yes | 52 | 32 |
| Studied criminology before | Yes | 13 | 8 |
| Attended university before/currently | Parents | 19 | 12 |
| | Siblings | 47 | 29 |
| | Close friends | 84 | 51 |
| | Close relatives | 58 | 35 |
| Have dependants | Children/carers | 29 | 18 |
| Work | Part-time | 81 | 49 |
| | Full-time | 3 | 2 |
| | Volunteer | 12 | 7 |
| | Training | 3 | 2 |
| Own transport | Yes | 53 | 32 |
| Local networks | Close family in local area | 98 | 60 |
| | Close friends in local area | 121 | 75 |
| Ongoing health problems | Yes | 15 | 9 |
| Property | Rented | 89 | 67 |
| | Mortgage | 40 | 30 |
| | Own | 3 | 3 |
| Living with | On own | 20 | 14 |
| | Spouse/partner | 15 | 10 |
| | Parents/relatives | 78 | 53 |
| | Friends | 33 | 23 |

Table 5. Students' qualifications and entry route

| Qualifications/entry route | n= | % | |
|-----------------------------------|---|----------|----|
| Qualifications | Traditional - A/AS levels | 56 | 35 |
| | Non-traditional – BTEC, Level 3 Diploma, Access to HE | 77 | 49 |
| | Mixed – traditional and non-traditional | 10 | 6 |
| | Other – Scottish Highers | 3 | 2 |
| | Overseas | 12 | 8 |
| UCAS points | mean | 282 | |
| | median | 275 | |
| | mode | 240 | |
| Clearing | Yes | 25 | 16 |
| | No | 111 | 70 |
| | Transfer | 23 | 14 |

Table 6. Students' outcomes at the end of stage 1

| Outcomes by stage | | n= | % |
|--------------------------|---|-----------|----------|
| Stage 1 | Pass and proceed (including trailing) | 123 | 75 |
| | Other | | |
| | Voluntary withdrawal | 15 | 9 |
| | Required to withdraw | 19 | 11 |
| | Internal transfer | 3 | 2 |
| | Awarded Cert. HE (withdrew or internal transfer) | 5 | 3 |

Table 7. Predictor variables and the odds of failing to progress onto second year of study

| Predictor Variable | Odds Ratio | 95% CI for Odds Ratio | |
|--|------------|-----------------------|--------|
| | | Lower | Upper |
| Moved to study at the university | 3.699* | 1.195 | 11.445 |
| Referred in assessments over the year | 5.903** | 1.883 | 18.503 |
| Thinking about dropping out of university survey 4 | 5.453** | 1.737 | 17.121 |

*p < .05. **p < .01.