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Ian W. Li

Denise Jackson  
*Edith Cowan University*

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# Influence of entry pathway and equity group status on retention and the student experience in higher education

Ian W. Li<sup>1</sup> · Denise Jackson<sup>2</sup>

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## Abstract

Expansionary policies to widen participation in higher education have led to a growth in alternative entry pathways into university. This study considers the experiences and retention outcomes of those entering Australian universities through different pathways, and how these vary across diverse student groups. Data were drawn from linked student administrative records for 81,874 students from sixteen Australian universities who commenced a Bachelor degree in 2015, with academic enrolment status tracked over five years, as well as data from a national survey of student experience conducted in 2019. Students from alternative pathways were associated with lower retention outcomes in the first year of study and poorer course completion outcomes, except those entering via pathway provider and enabling programs who reported more favourable retention compared to secondary school entrants. Students from equity group backgrounds were also associated with poorer retention outcomes, particularly Indigenous students, mature-age students, and those with disability. Associations between entry pathways, equity group status, and student experience were mixed. For example, equity group students generally had positive assessments of student experience, apart from those with disability, yet were associated with increased probabilities of intention to dropout from study. Social and personal reasons were found to be main drivers of dropout intention across different student groups. Findings highlight the need to address the varying factors that affect students entering through different pathways and from diverse backgrounds, rather than a one-size-fits-all approach. The study's recommendations inform stakeholders seeking to improve the experience and outcomes of diverse student groups entering higher education.

**Keywords** Alternative pathways · Equity · Retention · Course completion · Student experience

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✉ Ian W. Li  
ian.li@uwa.edu.au

Denise Jackson  
d.jackson@ecu.edu.au

<sup>1</sup> School of Population and Global Health, The University of Western Australia, Perth, Australia

<sup>2</sup> School of Business and Law, Edith Cowan University, Joondalup, Australia

## Introduction

Expansionary policies aimed at widening participation in higher education (HE) have led to the establishment of six student equity groups in Australia, whose access, participation, and outcomes in HE have been specifically targeted since 2008. The equity groups comprise students of low socioeconomic status (SES), that have disability, are from non-English-speaking backgrounds (NESB), regional and remote areas, who identify as Aboriginal and Torres Strait Islander (reported as Indigenous students), or are females in non-traditional study areas, including Science, Technology, Engineering, and Mathematics (STEM) (Dawkins, 1990). A further group that is underrepresented in HE, and investigated in this study, is mature-age students (aged 25 years and above) (Heagney & Benson, 2017).

In Australia, secondary school leavers are ranked within their student cohorts, with this percentile rank (known as the Australian Tertiary Admission Rank or ATAR) used as the basis to assess competitiveness for admission into university study (Pilcher & Torii, 2018). Undergraduate degree course guides, for instance, typically publish minimum ATAR cut-offs required for admission purposes. It has been identified that the use of ATAR for university admission could potentially be disadvantageous by excluding students from underrepresented backgrounds such as those from low socioeconomic status backgrounds from university study even though they have a reasonable prospect of successful completion (Norton, 2013). Policies aimed at widening participation have included alternative entry pathways into university (Higher Education Standards Panel, 2016). Broadly, alternative pathways include transfer from other HE courses, articulation from Vocational Education and Training (VET) courses, and professional and portfolio entry. They provide some students with a 'second chance' for HE, particularly non-traditional students (Diamond & O'Brien-Malone, 2018), and can result in increasingly diverse HE student populations (e.g. Turner et al., 2012). There is concern, however, that students entering via these pathways are inadequately prepared for university, such as having less-developed literacy and numeracy skills (Productivity Commission, 2019). While there is existing research that compares the academic success, completion rates, and labour market outcomes of equity group graduates with their more advantaged peers (e.g. Li et al., 2017), the experiences and outcomes of those entering HE through different pathways and across diverse student groups are less studied.

Our study addresses the lack of systematic and national empirical exploration of the effect of different pathways on student experience and outcomes, including the equity implications of non-school leaving pathways to Australian university study. More, specifically, the research questions are as follows: (i) Do retention and course progression differ based on equity group status? (ii) Do retention and course progression differ based on entry pathway? (iii) Does the student experience vary by equity group status? (iv) Does the student experience vary by entry pathway? To address these questions, we drew on extant national data to examine student experience and outcomes based on entry pathway, equity group membership and study area.

Our exploration of a range of outcomes, including course retention, progression, and aspects of student experience (e.g. learner engagement, skill development, dropout intention, and sense of belonging), makes a significant contribution to the limited evidence base on the relationship between HE equity policy and alternative admission pathways. Developing knowledge in this area is critical for students seeking a transformational experience with positive outcomes when investing in university education, and for stakeholders seeking to improve the experience and outcomes of equity groups in HE.

## Background

### Equity students and retention

Policies and practices for widening participation in HE have generated interest in how equity groups fare at university, such as rates of course retention or completion (Higher Education Standards Panel, 2018). Edwards and McMillan (2015) study of more than 650,000 domestic Bachelor students found that equity group membership was associated with lower university completion rates, intensified if students belonged to multiple groups. They reported SES' positive prediction of university completion was stronger for those in alternative pathways with only minimal differences for secondary school cohorts, particularly those with higher university entrance ranks. There is, however, evidence that once low-SES students enter university, their completion rates are similar to other students (Centre for Study in Higher Education, 2008; Marks, 2007). Edwards and McMillan also reported lower university completion rates for remote/regional students compared with metro-based peers, for entry via both school and other pathways. The region effect lessened with higher university entrance ranks, suggesting that prior academic achievement became a stronger predictor of completion than students' location.

Equity group membership is associated with enrolment characteristics that further impact on completion rates. For example, mature-age students are more likely to study externally and part-time and have significant work commitments during university (Heagney & Benson, 2017). Kemp and Norton (2014) asserted that equity groups are less prepared for university than traditional students, at greater risk of not completing and purported higher attrition rates for those with low university entrance measures. Similarly, the Productivity Commission (2019) found that non-traditional students entering HE since 2010 were more likely to drop out (23%) than other students (12%), attributed to weaker foundational skills on commencement, starting at an older age (due to working after school) and being more likely to study part-time and work while studying.

### Alternative pathways and retention

Despite the growth in alternative entry pathways, sector-wide comparisons of school-leaving versus alternative pathway student outcomes are uncommon, given that some forms of entry are institution-specific (Habel et al., 2016). There is evidence that those entering university as non-school leavers are associated with higher attrition (Chesters & Watson, 2014; Long et al., 2006). Edwards and McMillan (2015) found that 78.8% of secondary school leavers entering at Bachelor level completed university, compared to 69.4% of those entering through another pathway (VET, prior HE qualification, or a professional qualification). A positive association between university entrance ranks and completion levels has been reported in several studies (Edwards & McMillan, 2015; Kemp & Norton, 2014; Marks, 2007).

Interestingly, Edwards and McMillan (2015) found that those who did not report a university entrance rank recorded stronger completion rates than those with ranks below the 70th percentile, while Walker-Gibbs et al. (2019) posited a greater risk of failing or dropping out among students with no or low university entrance ranks compared to those with higher ranks. However, others have detected little evidence that university entrance ranks positively impact on completion rates, reporting comparable retention rates between

students entering via school and alternative pathways. For example, Knipe (2013) reported little difference in course completion rates for those with a university entrance rank above and below the 70th percentile and observed VET entrants as having the highest completion rate (78%) compared with school leaving pathway students (70%). Strong completion rates among VET graduates have been observed by others (for example, Chesters et al., 2018), particularly when the pathway is collaboratively supported by both VET and university sectors (Walls & Pardy, 2010).

Positive outcomes are also reported for enabling programs with similar, or better (Chesters & Watson, 2016), retention rates to those entering via traditional school pathways (Thomas, 2014). Pitman et al. (2016) found those enabling program entrants achieved superior first-year retention rates than other sub-Bachelor pathways, such as VET or pathway providers. Lower retention and completion rates are, however, reported among some—particularly school leavers with low university entrance ranks—compared with other pathways (Connor et al., 2018). Notably, the Higher Education Standards Panel (2018) found that the HE institution had a greater influence on student attrition rates than achieved university entrance rank or admission basis.

Cunninghame and Pitman (2020) highlighted that those experiencing but not completing HE have benefited from personal growth, skill and knowledge development, and exposure to potential career pathways, calling for a ‘more nuanced construction of success in higher education’ (p.926). Similarly, Bennett et al. (2013) observed students enrolled in an enabling program found positive aspects of the experience, even among those that did not complete. There are, however, opportunity costs of not completing HE in terms of foregone work experience and income, and the financial burden of student fees (Norton & Cheras-tidham, 2018).

### **Equity groups, pathways, and the student experience**

There is evidence that some experience challenges in their transition to and during HE study, and widening participation requires support for certain student groups to enjoy and succeed at university (Brooman & Darwent, 2014; Sellar & Gale, 2011). Bourdieu (1986) theorising on cultural capital informs our understanding of the challenges experienced by equity students (e.g. Meuleman et al., 2015; Walker-Gibbs et al., 2019) whereby a student’s habitus (their culturally infused perception and interpretation of the world) and cultural capital can significantly influence how they engage with the ‘field’ (ways of thinking, communicating and being) of HE. HE’s field strongly reflects the middle classes (Keddie et al., 2008), and is therefore less familiar to low SES students who often lack the cultural capital, knowledge and internalised code to successfully navigate it (Habel et al., 2016).

The distinctiveness of HE’s cultural capital, or ‘academic capital’ (Bourdieu, 1986), can challenge some students when transitioning to and remaining at university (Gale & Parker, 2011). Indeed, equity students can feel alienated and uncomfortable because they have not developed the necessary cultural capital from their everyday interactions with personal networks and find it difficult to adjust to expectations at university (Andres et al., 2007; Kezar, 2011; Krause, 2006). Accordingly, first-in-family students can experience ‘imposter syndrome’ when transitioning to university because of their background and lack of confidence (Martin, 2015; O’Shea, 2019) and are also challenged by reconciling existing identities with their new student status (Waller et al., 2011).

Equity students can also have less support from family, poorer access to resources, and feel inhibited in engaging with other students, impacting on their informal learning and leading to

feelings of isolation and early withdrawal (Meuleman et al., 2015; Thomas, 2014). They are more likely to experience financial hardship (Pollard, 2018), making participation in social, extra-, and co-curricular activities particularly challenging (Future Track, 2013). They can have underdeveloped professional networks for internship and employment purposes (Peach et al., 2016), impacting on their ability to leverage their evidenced benefits for capability development and improved employment prospects (Jackson, 2015; Jackson & Collings, 2018).

Alongside efforts to improve access have been targeted initiatives to more quickly socialise equity students into HE culture and way of life, enabling a smoother transition to university (e.g. Kift, 2009). Interventions targeting well-being and retention should be in the early years of study (Brinkworth et al., 2009) and encourage networking building, friendship, and a sense of belonging and community (Wrench et al., 2013). Gravett et al. (2020) highlighted the pitfalls of HE academics and professional staff viewing equity students through a deficit lens, apparent in other studies (Baker & Irwin, 2016; Walker-Gibbs et al., 2019), and advocated for greater understanding and support for students of heterogenous backgrounds transitioning from alternative pathways.

Regarding alternative pathways and the student experience, Griffin (2014) reports how the transition from VET to HE is challenged by education system differences, such as theoretical versus practical focus, teaching, learning and assessment styles and environment, and academic standards. Consequently, support mechanisms are recommended for transitioning students, such as programs on academic literacy, critical thinking, research skills, effective time management, and peer contact and mentoring arrangements (Blacker et al., 2011; Catterall & Davis, 2012). Some observe how alternative pathways cannot always cater for different student groups, particularly school leavers and mature-age students. For example, Connor et al. (2018) attest enabling programs are largely designed for those returning to study and 'are unlikely to be an appealing option for recent school leavers' (p.7) who underperformed at school. They lament how the programs focus heavily on developing academic skills, rather than enhancing motivation for study, which may underpin poor earlier academic performance. Conversely, others assert their value for building confidence, supporting adjustment to academic culture, increasing self-belief, and heightening ability for learning (Habel et al., 2016; Pitman et al., 2016).

Mature-age students who enter university through alternative pathways can feel their work and life experience are undervalued at university (e.g. Murray & Klinger, 2012), and are 'in-between' and struggling with competing demands on their time (work/study/life) and fitting in with HE culture (Habel et al., 2016; Mallman & Lee, 2017). Interestingly, Australia's national Student Experience Survey (SESurv) has reported little variation in key experience variables (engagement/teacher quality/support/skills development) by equity group status (Social Research Centre, 2020). Edwards and McMillan (2015), however, observed stronger intentions to leave university early among low SES, regional and Indigenous students, and those entering via alternative pathways. Common reasons included health/stress, workload challenges, life/study balance, financial difficulties, and needing to undertake paid work.

## Methodology

### Participants and procedures

The study drew on two data sources. The first was enrolment data for domestic students who commenced a Bachelor degree in 2015 in 16 of Australia's 43 universities (all invited

to participate in the study). The 16 universities provided data on 81,874 students' admission pathway, degree details, demographics, and enrolment status, tracked over five years until 2019. Of the 16 universities, eight provided broad admission pathway classifications used by the Department of Education, Skills and Employment (DESE) while the other eight provided detailed admission pathway classifications. To optimise analysis using the detailed admission pathway classifications, our study analysed the institutional sample ( $n=48,361$ ) separately to the pooled sample (all universities) using the broad DESE classifications ( $n=81,874$ ). The second dataset is the 2019 SESurv, a national survey investigating aspects of HE students' experience in Australian universities. Administered annually, the response rate for 2019 was 42.6% (Social Research Centre, 2020), resulting in data for 72,805 domestic undergraduates in their commencing year of study. Summary characteristics for the SESurv sample, those with detailed institutional admission pathways and broad DESE admission pathways, are presented in Table 1.

## Measures

DESE admission pathway classifications comprise the secondary education pathway (45% of the DESE sample), transfer from another HE course (18%), mature-aged entry (15%), completion of a VET award (12%), professional qualification (0.3%), and other pathways (10%). The detailed admission pathway classifications maintained by eight of the participating institutions permitted the disaggregation of the 'other' pathway to more refined sub-categories: access, portfolio, pathway providers, enabling, and residual categories retained under the 'other' category. The admission pathway categories were coded as binary variables, with 1 for a student admitted via the respective pathways and 0 otherwise. Classifications for students' SES and regional/remote status were determined by residential postcode. Students from low SES backgrounds are defined as those from the lowest quartile of socio-economic areas according to the Australian Bureau of Statistics' Socio-Economic Indexes for Areas and Index of Education and Occupation. Students from regional and remote areas are defined as those whose permanent home address are from a regional or remote area, based on the Australian Statistical Geography Standard: Remoteness Structure. The first-year retention outcome variable was coded as a binary variable, where 1 represents a student remaining enrolled after first year of study, 0 otherwise. The continued enrolment or course completion outcome variable was coded as a binary variable, with 1 indicating completion or remaining enrolled in the course commenced in 2015 or a different Bachelor degree.

## Analysis

Binary logistic regression models were developed to investigate the binary outcomes of (i) first-year retention, (ii) continued enrolment or course completion, (iii) student experience, and (iv) intention to drop out. The general form for the binary logistic regression model can be expressed as:

$$Y_i^* = \beta X_i + \beta Z_i + \varepsilon_i, i = 1, \dots, n \quad (1)$$

where  $Y_i^*$  is a latent index representing the propensity of individual  $i$  to be in the positive category of the respective outcomes above,  $X_i$  denotes a vector of graduate characteristics

**Table 1** Participant characteristics

Variable	Sub-groups	Institutional ( <i>n</i> =48,361)		DESE ( <i>n</i> =33,513)		SESurv ( <i>n</i> =72,805)	
		Count	%	Count	%	Count	%
Age (years)	0–24	37,815	78.2	28,226	84.2	58,829	80.8
	25–29	4074	8.4	2262	6.7	4556	6.3
	30–39	3923	8.1	1845	5.5	5282	7.3
	40+	2549	5.3	1180	3.5	4138	5.7
Gender	Male	19,434	40.2	14,271	42.6	24,164	33.2
	Female	28,927	59.8	19,242	57.4	48,641	66.8
Indigenous	Indigenous	881	1.8	557	1.7	1431	2.0
	Non-Indigenous	47,480	98.2	32,956	98.3	71,374	98.0
Disability	With disability	3886	8.0	1957	5.8	5266	7.2
	Not with disability	44,475	92.0	31,556	94.2	67,539	92.8
SES	Low	4607	9.5	6284	18.8	12,941	17.8
	Not low	43,754	90.5	27,229	81.2	59,864	82.2
NESB	English	41,444	85.7	23,533	70.2	69,298	95.2
	Other	6917	14.3	9980	29.8	3507	4.8
Study mode	On-campus	39,819	82.3	31,550	94.1	58,851	80.8
	Off-campus	7390	15.3	1025	3.1	7070	9.7
	Mixed-mode	1152	2.4	938	2.8	6884	9.5
Discipline	Natural/Physical Sciences	8066	16.7	4566	13.6	8872	12.2
	Information Technology	1617	3.3	1397	4.2	2395	3.3
	Engineering/related	435	0.9	1163	3.5	4552	6.3
	Architecture/Building	1048	2.2	801	2.4	1815	2.5
	Agriculture/Environment	110	0.2	300	0.9	961	1.3
	Health/related	8,364	17.3	6,403	19.1	17,586	24.2
	Education/related	5146	10.6	1375	4.1	5673	7.8
	Management/Commerce	9426	19.5	5173	15.4	7827	10.8
	Society/Culture	10,367	21.4	10,447	31.2	17,478	24.0
Creative Arts/other	3782	7.8	1888	5.6	5646	7.8	

including admission pathways and equity group status, and  $\beta$  denotes a vector of parameters to be estimated.

The determinants of mismatch are then estimated using the binary logistic regression model:

$$(\Pr Y_i = 1 | X_i) = \frac{e^{\beta X_i}}{1 + e^{\beta X_i}} \quad (2)$$

Average marginal effects from the binary logistic regression results were calculated and presented below. Analyses were conducted using Stata version 17.



## Results

### Retention

The average marginal effects from the logistic regression model of first-year retention are presented in Table 2. Prior to presentation of the estimated effects, it is first noted that the McFadden pseudo-R-squared values for the models are rather low, ranging from 0.053 to 0.072. However, there were a number of variables estimated to have statistically significant associations with first-year retention. This indicates that a substantial amount of variation in first-year retention might be explained by variables that have not been captured in our models.

First-year retention differed significantly across entry pathways. The estimated effects for HE course, VET award, mature-age entry, and other basis were negative and statistically significant, relative to the reference group of secondary education. Where more detailed admission categories were included in the institutional pathways sample, the estimated effects tended to be larger. However, the pathway provider and enabling program were associated with increased retention of 4% and 6%, respectively. These effects were qualitatively consistent when looking at the field-specific models for STEM and HASS samples.

There were mixed results on first-year retention of equity groups. In the institutional sample, Indigenous students were less likely to be retained in first year by 6% compared to non-Indigenous students, with effect sizes larger in the STEM samples. Disability was not associated with first-year retention in the institutional sample but was associated with a small 1% reduction in the DESE model. This appeared to be driven by a 4% and 2% reduction in the STEM samples.

Low SES students were generally associated with reduced probabilities of retention across the models.

There were no statistically significant effects for regional/remote students in either full sample (e.g. all fields of study), but a lower probability of retention was found in STEM in the institutional sample and the HASS group in the DESE sample. Mature-age students were associated with a lower probability of retention in the DESE sample, with an even larger reduced probability for HASS. NESB students, contrary to the earlier equity groups discussed, were associated with increased likelihood of retention. These effects were minute in the DESE sample. However, estimated effects for NESB were larger in the institutional sample. Women in STEM were associated with increases in retention.

The results of the models of continued enrolment and course completion are presented in Table 3. Again, the pseudo-R-squared values are small, although, as with earlier results, several estimates are statistically significant, including at the one percent level. Table 3 results reinforce the general pattern from the earlier results of first-year retention outcomes—those from alternative pathways appear to have poorer continued enrolment and course completion. This is illustrated by the negative estimates on nearly all variables. The exceptions, again, are the pathway provider and enabling program pathways which were associated with improved probabilities of continued enrolment or course completion. Many of the estimated effects also appeared to be much larger in magnitude compared to the corresponding estimates for the models of first-year retention.

The estimated effects for pathway variables were also qualitatively consistent with the same sign for the broad field sub-samples. An exception worth highlighting is the estimated effect for HE course, negative for both full institutional and DESE samples,

**Table 2** Logistic regression models for first-year retention

	Institutional pathway			DESE pathway		
	All	STEM	HASS	All	STEM	HASS
<i>Admission pathway (excluding secondary education)</i>						
HE course	−0.051*** (0.006)	−0.090*** (0.010)	−0.008 (0.008)	−0.018*** (0.004)	−0.045*** (0.007)	0.011** (0.006)
VET	−0.062*** (0.008)	−0.087*** (0.013)	−0.052*** (0.010)	−0.032*** (0.005)	−0.066*** (0.009)	−0.012* (0.007)
Mature-age entry provisions	−0.099*** (0.017)	−0.092*** (0.023)	−0.078*** (0.023)	−0.020*** (0.006)	−0.027*** (0.009)	−0.006 (0.008)
Other basis (no further information)	−0.056*** (0.008)	−0.043*** (0.013)	−0.052*** (0.010)	−0.006 (0.005)	−0.014* (0.008)	0.010 (0.006)
Other: Access	0.011 (0.026)	−0.051 (0.037)	0.086*** (0.033)			
Other: Portfolio	−0.090*** (0.028)	−0.153*** (0.048)	−0.048 (0.036)			
Other: Pathway	0.042** (0.018)	0.046 (0.028)	0.061*** (0.023)			
Other: Enabling	0.055*** (0.009)	−0.031 (0.021)	0.092*** (0.011)			
<i>Equity group (excluding those not in an equity group)</i>						
Indigenous	−0.063*** (0.015)	−0.101*** (0.024)	−0.049** (0.020)	−0.047*** (0.011)	−0.060*** (0.018)	−0.042*** (0.015)
Disability	−0.009 (0.008)	−0.036*** (0.011)	0.011 (0.010)	−0.012** (0.006)	−0.022** (0.009)	−0.003 (0.008)
Low SES	−0.013** (0.006)	−0.007 (0.009)	−0.021** (0.009)	−0.005 (0.004)	−0.011* (0.006)	−0.002 (0.006)
Regional/remote	−0.007 (0.006)	−0.017* (0.010)	0.002 (0.008)	−0.006 (0.004)	0.004 (0.006)	−0.018*** (0.006)
NESB	0.032*** (0.006)	0.016** (0.007)	0.036*** (0.008)	0.007* (0.004)	0.010* (0.005)	−0.001 (0.006)
Women in STEM	0.031*** (0.005)	0.006 (0.006)	0.013** (0.006)	0.039*** (0.004)	0.012** (0.005)	0.009** (0.004)
Mature-age	−0.011 (0.008)	0.005 (0.012)	−0.026** (0.010)	−0.017*** (0.006)	0.010 (0.009)	−0.041*** (0.009)
Observations ( <i>n</i> )	48,361	19,674	28,687	81,874	34,321	47,553
Pseudo- $R^2$	0.068	0.072	0.071	0.056	0.053	0.060

Standard errors are reported in parentheses

\*\*\* $p < .01$ ; \*\* $p < .05$ ; \* $p < .1$

All models included controls for age, attendance mode, and university group

and for the respective STEM sub-groups but which had positive estimated effects for the HASS sub-groups. Statistically significant effects on continued enrolment and course completion were also found for equity groups. These effects ranged from a reduced 14% probability for Indigenous students to an increased 4% probability for

**Table 3** Logistic regression models for course completion or continued enrolment

	Institutional pathway			DESE pathway		
	All	STEM	HASS	All	STEM	HASS
<i>Admission pathway (excluding secondary education)</i>						
HE course	-0.013** (0.007)	-0.066*** (0.011)	0.020** (0.008)	0.011** (0.005)	-0.031*** (0.008)	0.041*** (0.006)
VET	-0.111*** (0.009)	-0.150*** (0.016)	-0.092*** (0.011)	-0.095*** (0.007)	-0.125*** (0.011)	-0.078*** (0.008)
Mature-age entry provisions	-0.282*** (0.015)	-0.312*** (0.023)	-0.246*** (0.020)	-0.091*** (0.007)	-0.082*** (0.011)	-0.084*** (0.009)
Other basis	-0.058*** (0.009)	-0.019 (0.016)	-0.064*** (0.011)	-0.011* (0.006)	-0.018** (0.009)	-0.004 (0.007)
Other: Access	-0.094*** (0.028)	-0.041 (0.040)	-0.121*** (0.038)			
Other: Portfolio	-0.208*** (0.033)	-0.230*** (0.059)	-0.187*** (0.040)			
Other: Pathway	0.100*** (0.021)	0.021 (0.037)	0.145*** (0.026)			
Other: Enabling	0.046*** (0.011)	-0.113*** (0.029)	0.083*** (0.013)			
<i>Equity group (excluding those not in an equity group)</i>						
Indigenous	-0.144*** (0.017)	-0.191*** (0.027)	-0.119*** (0.022)	-0.128*** (0.014)	-0.159*** (0.022)	-0.107*** (0.017)
Disability	-0.035*** (0.008)	-0.048*** (0.012)	-0.011 (0.011)	-0.037*** (0.007)	-0.044*** (0.010)	-0.021** (0.009)
Low SES	-0.021*** (0.007)	-0.020* (0.012)	-0.018* (0.010)	-0.020*** (0.005)	-0.024*** (0.008)	-0.015** (0.007)
Regional/remote	-0.014* (0.007)	0.001 (0.011)	-0.017* (0.009)	-0.025*** (0.005)	-0.008 (0.008)	-0.041*** (0.007)
NESB	-0.001 (0.006)	-0.004 (0.009)	0.007 (0.009)	-0.010** (0.004)	0.003 (0.006)	-0.023*** (0.006)
Women in STEM	0.042*** (0.005)	0.051*** (0.007)	0.027*** (0.006)	0.054*** (0.004)	0.050*** (0.006)	0.035*** (0.005)
Mature-age	-0.016* (0.009)	-0.008 (0.015)	-0.014 (0.012)	-0.021*** (0.008)	-0.007 (0.012)	-0.032*** (0.010)
Observations ( <i>n</i> )	48,361	19,674	28,687	80,380	33,400	46,980
Pseudo- <i>R</i> <sup>2</sup>	0.059	0.053	0.076	0.039	0.032	0.051

Standard errors are reported in parentheses

\*\*\**p*<.01; \*\**p*<.05; \**p*<.1.

Models controlled for age, attendance mode, and university group

women in STEM, with no statistically meaningful effects found for NESB students. There were also differences in the magnitude of effects by field of study sub-groups, with stronger effects for STEM students.

## Other aspects of student experience

Average marginal effects calculated from the logistic regression model results for student experience and dropout intention are presented in Table 4. The estimated effects for the various alternative pathways were mixed in sign, indicating divergent effects across the various measures of student experience. No statistically significant effects were found for students admitted via professional qualification, while VET students were associated with reduced satisfaction for learning resources, and increased satisfaction with skills development and sense of belonging. There was reduced satisfaction with teaching quality, learner resources, and student support for students transitioning from HE courses, yet greater satisfaction with learner engagement and skills development. There were also mixed results for mature-age entry students who reported less satisfaction in learner engagement but increased for teaching quality, student support, skills development, and sense of belonging. Students from the ‘other’ admission category were associated with increased satisfaction for learner engagement, teaching quality, student support, skills development, and sense of belonging, and were also the only group found to have a statistically significant and reduced effect of the intention to dropout from study.

Table 4 also highlights the mixed results for satisfaction by equity group. Indigenous, NESB, and regional/remote students reported increased satisfaction in certain or all experience dimensions, yet an increased probability of dropout intention. Students with disability were associated with reduced satisfaction across all dimensions except student support and increased probability of dropout intention. Mature-age students also reported less favourable results with reduced satisfaction across several dimensions, learner engagement being particularly sizeable (7.7%). There were mixed effects observed for low SES students for the various satisfaction indicators and dropout intention, although estimates were negligible in terms of effect size, other than increased satisfaction with student support and sense of belonging. Women in STEM had increased satisfaction across all aspects except learner engagement.

Reasons underpinning dropout intention by admission pathway are presented in Table 5. Students who indicated that they intended to leave university studies selected all reasons of influence and the proportions by reasons selected are presented here. The final row that summarises the proportions for all students shows all categories were substantial drivers of dropout intention. However, the clear standout was the social/personal category, with academic/institutional, health, and disposition close behind. Disposition (towards studies) is an insulating factor protecting against dropout. The disaggregated proportions by admission pathway show that social/personal reasons remained the dominant driver of dropout intention, exceeding 60% across all admission pathways. Financial reasons appeared to be relatively less important for secondary education students but carried more weight for all other alternative pathways. Conversely, disposition towards studies were relatively more important for secondary education students, but was less important for alternative pathway entrants, especially VET award students.

**Table 4** Logistic regression models for student experience and dropout intention

	Learner engagement	Teaching quality	Learning resources	Student support	Skills development	Sense of belonging	Overall satisfaction	Dropout intention
<i>Admission pathway (excluding secondary education)</i>								
HE course	0.008* (0.005)	-0.016*** (0.004)	-0.034*** (0.003)	-0.022*** (0.005)	0.016*** (0.004)	-0.019*** (0.005)	-0.019*** (0.004)	-0.001 (0.004)
VET	-0.006 (0.007)	-0.004 (0.005)	-0.019*** (0.005)	-0.001 (0.006)	0.019*** (0.006)	0.017** (0.007)	-0.002 (0.005)	-0.008 (0.006)
Mature-age entry provisions	-0.021* (0.011)	0.015* (0.009)	0.005 (0.009)	0.033*** (0.011)	0.019** (0.009)	0.030** (0.012)	0.010 (0.009)	-0.014 (0.010)
Professional qualification	-0.017 (0.028)	-0.020 (0.019)	-0.012 (0.022)	0.007 (0.026)	0.021 (0.021)	0.020 (0.028)	-0.012 (0.020)	-0.001 (0.022)
Other basis	0.034*** (0.005)	0.012*** (0.004)	0.002 (0.004)	0.025*** (0.005)	0.030*** (0.005)	0.043*** (0.006)	0.010** (0.004)	-0.014*** (0.005)
<i>Equity group</i>								
Indigenous	0.016 (0.013)	0.013 (0.010)	0.006 (0.009)	0.023* (0.012)	0.010 (0.010)	0.040*** (0.013)	0.027*** (0.010)	0.033*** (0.010)
Disability	-0.025*** (0.007)	-0.018*** (0.005)	-0.026*** (0.004)	0.006 (0.006)	-0.033*** (0.005)	-0.030*** (0.007)	-0.014*** (0.005)	0.037*** (0.005)
Low SES	-0.009** (0.005)	-0.001 (0.003)	-0.005 (0.003)	0.013*** (0.004)	0.009** (0.004)	0.019*** (0.005)	-0.003 (0.004)	0.009** (0.004)
Regional/remote	0.014*** (0.004)	0.013*** (0.003)	0.012*** (0.003)	0.025*** (0.004)	0.010*** (0.004)	0.038*** (0.005)	0.014*** (0.004)	0.019*** (0.004)
NESB	0.002 (0.008)	0.001 (0.006)	0.001 (0.006)	0.019** (0.008)	0.031*** (0.007)	0.090*** (0.009)	-0.014** (0.006)	-0.079*** (0.008)
Women in STEM	0.008 (0.006)	0.013*** (0.004)	0.013*** (0.004)	0.014** (0.005)	0.027*** (0.005)	0.020*** (0.006)	0.023*** (0.004)	0.003 (0.005)

**Table 4** (continued)

	Learner engagement	Teaching quality	Learning resources	Student support	Skills development	Sense of belonging	Overall satisfaction	Dropout intention
Mature-age	-0.077*** (0.005)	-0.001 (0.004)	0.003 (0.004)	0.019*** (0.005)	-0.032*** (0.005)	-0.019*** (0.006)	-0.009** (0.004)	0.021*** (0.005)
Observations ( <i>n</i> )	72,787	72,788	66,605	60,634	72,763	72,729	72,783	72,497
Pseudo- <i>R</i> <sup>2</sup>	0.085	0.035	0.016	0.014	0.0334	0.018	0.041	0.030

Standard errors are reported in parentheses

\*\*\**p*<.01; \*\**p*<.05; \**p*<.1

Models controlled for attendance mode, type, study area, university group, and grade band

**Table 5** Reasons for intention to leave university, by admission pathway (%)

Pathway	Financial	Health/stress	Academic/ institutional	Social/personal	Workload	Disposition	<i>n</i>
Secondary education	33.7	43.3	49.1	67.2	42.5	55.3	7559
HE course	44.5	48.0	51.2	63.0	42.5	35.4	3343
VET	49.4	48.2	45.3	66.1	51.5	26.5	1531
Mature-age entry provisions	51.6	57.5	37.7	65.8	43.8	31.9	395
Other basis	40.9	47.5	46.3	68.5	46.0	45.6	1075
Total	39.2	45.8	48.5	66.3	43.9	45.9	14,093

## Discussion/implications

Students entering HE via mature-age provisions, VET, HE course transfer, access programs, and portfolio-entry reported lower retention outcomes, particularly with respect to full course enrolment, compared to the traditional secondary education route. These findings support earlier evidence of the negative association between alternative entry pathways and retention (Chesters & Watson, 2014; Edwards & McMillan, 2015) and were broadly consistent across disciplines. Clearly, there is a need to better understand the needs and experiences of these students to clarify and ensure more longer-term support that extends beyond first-year interventions. Conversely, students entering through pathway providers or enabling programs were more likely to remain at university, affirming earlier evidence of their effectiveness of the latter (Morgan, 2020; Pitman et al., 2016) and endorsing expansion of both. At the same time, it is also unknown whether the characteristics of students from the various admission pathways differ, and if the divergence in student outcomes found in the present study is being driven by differences in the characteristics of the respective student cohorts.

Student satisfaction with aspects of their university experience may help us to understand retention outcomes and there were notable differences by entry pathway. Consistent with documented challenges in earlier studies (see Nuñez & Yoshimi, 2017), students transferring from other HE courses were the least satisfied relative to secondary school entrants, prompting greater consideration of this cohort's needs and experiences (Tobolowsky & Cox, 2012). While there were more mixed results for VET and mature-age entry provisions entrants, those entering on 'other' basis appeared more satisfied with different aspects of their university experience. Other than for skill development, where alternative pathway entrants recorded consistently higher satisfaction scores than secondary school entrants, there were no clear patterns that indicated consistently low, or high, ratings across the experience dimensions. Perhaps noteworthy were the lack of reported differences for sense of belonging, only significantly lower for HE course transfer students. Also important were the relatively high levels of student support noted among certain groups (although not HE transfers), perhaps indicative of targeted support for these groups which have evolved in line with widening participation policy. Despite these rather mixed results, an important observation is that students entering

from alternative pathways had a comparable—if not reduced—likelihood of intending to leave university, contrary to earlier evidence (Edwards & McMillan, 2015).

Evidently, reasons for intending to dropout can differ by entry pathway. For example, health and financial reasons were more important to students from VET and mature-age provision pathways. These reasons would be understandably more prevalent among mature students whose life stage may bring greater financial and family obligations. Academic/institutional factors underpinned attrition among secondary school entrants and those transferring from other HE courses, perhaps explaining habitual movement across universities in the latter group. The importance of workload to VET entrants could reflect suggestions that VET is more focused on skills and jobs rather than academic and critical thinking skills, leading to poor preparedness and difficulties in students adjusting to university study (see Barber & Netherton, 2018; Catterall et al., 2014). Clear communication between the two sectors on articulation pathways that optimise student outcomes appears important (Walls & Pardy, 2010), alongside programs on research skills and time management for incoming students (Catterall & Davis, 2012). Frequent mention of disposition or attitude to study among secondary school entrants as a reason for intending to dropout highlights the importance of cognisance of generation Z's desire for a diverse and engaging study experience (Loveland, 2017).

More overwhelming differences in satisfaction were evident in the student experience among equity groups. Weaker retention among Indigenous students has been attributed to personal circumstances (e.g. housing and finance) and community/family reasons (Pechenkina et al., 2011). While there are calls for institution-wide approaches for better support at university (Uink et al., 2021), their higher satisfaction rates for student support and sense of belonging, and overall, might suggest a greater focus on counselling and coping strategies to help manage personal factors. Weaker retention outcomes, reduced likelihood of being satisfied with the overall student experience, and stronger intentions to leave university among students with disability and of low-SES background, in the short and longer term, are consistent with earlier studies (Edwards & McMillan, 2015; Kilpatrick et al., 2017; Li & Dockery, 2015) and strongly signal the need for additional support.

The reduced likelihood of regional/remote students completing studies and their increased intention to leave university echoes Edwards and McMillan (2015) findings, although they were more likely to be satisfied with different aspects of their experience, including sense of belonging. By contrast, NESB students and women in STEM fields generally reported higher levels of student satisfaction, particularly positive for the latter group given evidence of their heightened anxiety, poorer experience and elevated attrition with respect to males in STEM (Fisher et al., 2020; Pelch, 2018). Although retention did not vary among mature-age students, they were more likely to consider dropping out and less likely to be satisfied with several of the experience dimensions. This may support reported perceptions that their accrued experience is unappreciated at university (e.g. Murray & Klinger, 2012) and their challenges with balancing work, study, and family commitments (Mallman & Lee, 2017). Interestingly, they felt relatively supported, positive given Mallman and Lee's observation that strategies to support mature students may not align with those directed at younger cohorts who underperformed at school.

Retention was generally less favourable in the STEM field, worrisome given efforts to channel students into these fields (Department of Education, Skills and Employment, 2020). Recent government initiatives have highlighted the need to strengthen outcomes in STEM with industry engagement considered an important mechanism for improvement (Department of Education, Skills and Employment, 2021).



The consistently positive results for student support across the equity groups, albeit to differing degrees, are notable. Of concern, however, is that even those broadly satisfied with their student experience, all apart from NESB and women in STEM students, reported a greater likelihood of considering leaving university than their peers. This prompts urgent attention and suggests factors beyond the defined aspects of the student experience are at play. The association between financial and health/stress concerns and alternative pathways is not surprising, given more equity students enter HE this way and generally experience greater financial pressure from balancing study and work commitments than their peers (Li & Carroll, 2020; Munro, 2011; Willans & Seary, 2018). The dominating influence of social and personal factors, also the most highly cited among secondary education entrants, emphasises the need for cohesive strategies that facilitate connection among peers and build students' social and cultural capital, including online learners who may experience elevated feelings of isolation and who are becoming more prevalent in the sector (Stone & O'Shea, 2019). Although early years interventions are important (Brinkworth et al., 2009), longer-term retention outcomes illuminate the need for encouraging networks, peer connections, and sense of community beyond the first-year experience.

The nuanced findings emphasise the different experiences and needs of diverse student populations. This signals a clear need for universities to review their systems, processes, and curriculum structures to better support heterogenous cohorts. This may be achieved through top-down mechanisms, where diversity and inclusion feature in strategic planning are interwoven with other institutional goals (such as enhancing employability), as well as a grassroots approach where students are consulted on what needs to change and how. Combining these approaches to create systems and a culture that support all students will help universities shift from a deficit lens to managing diversity to positively embracing individual differences.

## Conclusion

Overall, the findings emphasise that retention and support strategies need to be tailored to address the varying factors that affect students entering through different pathways, rather than a one-size-fits-all approach. Educating academics and professional staff on the diverse needs, characteristics, and experiences of equity groups (Baker & Irwin, 2016) and encouraging a strengths-based approach to support different cohorts (Gravett et al., 2020) are important, while having realistic expectations about what they can achieve without support.

The study leads to recommendations on ways that institutions can optimise the value of alternative entry pathways and where and how they can better support students from different entry pathways to improve their experience and outcomes at university. This understanding is critical both from an equity perspective and for sustaining institutional funding, given this is now partially determined by student outcomes in Australia. Furthermore, it documents an innovative approach to using existing data to examine student experiences and outcomes in Australian universities across different disciplines, student groups, and entry pathways. This allows the sector to benchmark and monitor changes in equity group participation and outcomes in HE via different entry pathways.

At this point, it is also worth noting some caveats when interpreting the findings. As noted earlier, the pseudo R-squared for the estimated logistic regression models tended to be low, indicating that much of the variation in the outcomes evaluated are explained by factors beyond the explanatory variables in our models. Hence, while this study uncovered

statistically significant differences in student outcomes by admission pathway and other factors, there are other characteristics to be investigated. Another limitation in this study was the potential for further refinement in the consideration of alternative pathways. This was due to the heterogeneity across institutions in terms of admissions pathway categories captured in their internal systems, particularly students from the residual ‘other’ pathway. Greater clarity on this group’s composition would enable better development of institutional strategies to support constituent students. Another area of uncertainty lies in whether student outcomes by admission pathways vary across university types or groups. The group of eight universities in Australia, for instance, are typically more selective in their admission processes and differential academic outcomes might surface on the basis of this selectivity. While the present study did account for university group in the modelling approach, a deeper dive into institutional differences and how that interacts with alternative pathways and student outcomes could be valuable.

Furthermore, it is possible that the role alternative pathways play in influencing student outcomes differs by discipline area. Future investigation in this area is warranted. In addition, recent studies have uncovered differences in graduate outcomes for equity groups, and it would be of interest to examine whether differential graduate outcomes (e.g. employment and postgraduate study opportunities) exist by entry pathway (Carroll & Li, 2022; Li et al., 2017). Furthermore, while our study investigated outcomes in STEM and HASS, there may be differences within those broad discipline areas. Future research exploring more granular differences by alternative pathways, university type or groups, equity groups, and sub-disciplines would be valuable.

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## Declarations

**Conflict of interest** The authors declare no competing interests.

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