



# Exploring the Interplay Between Equity Groups, Mental Health and Perceived Employability Amongst Students at a Public Australian University

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## Abstract

This article explores the interplay between perceived employability (PE), mental health, and equity group membership amongst students at a large public urban university in Australia. The article reports from a study conducted between 2017 and 2022, during which students self-assessed their PE. Differences in PE by equity group membership were assessed using responses to structured fields in the questionnaire (n=24,329). Custom measures were constructed using student responses to open-ended fields to proxy student wellbeing based on sentiment analysis and mention of mental health or synonymous terms (n=12,819). Analyses included two-way tests of differences between groups and multivariate analyses considering the effect of equity group membership and mental health concerns on employability beliefs. Results indicate that students with a disability, with English as a second language, or with wellbeing concerns report lower perceived employability. Of all the PE dimensions, academic self-efficacy is most consistently affected by equity group membership and wellbeing concerns. Further, wellbeing concerns are more prevalent for students with disabilities. The findings strengthen support for policy and institutional initiatives focusing on student wellbeing in general but also specifically for equity groups that are already associated with poorer employability beliefs. In particular, students with disabilities appear to have poorer self-esteem and academic self-efficacy and are more likely to have mental health concerns.

**Keywords** Equity groups · Perceived employability · Mental health · Self-efficacy · Graduate employability

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## Introduction

A core purpose of higher education institutions is to produce highly skilled graduates who will contribute to society. Employability is a multi-dimensional (Barkas et al., 2021) process of becoming (Holmes, 2013) that demands attention across the career lifespan (Bennett, 2019; Williams et al., 2016) through the ‘continuous fulfilling, acquiring or creating of work through the optimal use of competences’ (Heijde & Van Der Heijden, 2006, p. 453). Training on employability skills is vital to ensure all graduates successfully transition from education to employment, regardless of social origins (Tomaszewski et al., 2021).

The focus of this study is perceived employability (PE), which Rothwell et al. (2008, p. 1) define as ‘the perceived ability to attain sustainable employment appropriate to one’s qualification level’. Defining PE as a psychological concept influenced by individual competencies, dispositions and environment, Vanhercke et al. (2014, p. 600) highlight the potential for measures of PE to ‘identify personal strengths and weaknesses that should be accounted for in the future career, and that may help to develop an individualised coaching trajectory’.

The PE of higher education students can be thought of as learners’ self-appraisal of efficacy beliefs or self-beliefs related to study and career success—salient components of self-schemata (Usher & Pajares, 2008) approached from the individual’s perspective (Fugate et al., 2004). PE strongly correlates with student engagement, academic performance, and both career establishment and progression (Doménech-Betoret et al., 2017; Vanhercke et al., 2014). This is because students’ attitudes and subjective norms, and their behavioural intentions, are crucial to decisions ranging from which course to study (Soria & Stebleton, 2013) through to their graduate employment (Malgwi et al., 2005).

People who belong to one or more equity groups, however, often experience inequitable access to employability experiences (Doyle, 2011; Harvey et al., 2017; Simpson & Ferguson, 2013). The Australian National Student Equity Framework identifies equity groups as including people from low socio-economic status (SES) backgrounds, regional and remote areas, non-English speaking backgrounds (NESB), those living with a disability, and women in non-traditional areas such as science, technology, engineering and maths (Department of Employment, Education and Training, 1990). Although the Framework was drafted more than 30 years ago, there has been slow progress towards comprehensive reform (Harvey et al., 2016). Government data shows that membership in multiple equity groups reduces university completion rates, having additive and compounding negative effects (Department of Education, Skills and Employment, 2020b). Empirical studies demonstrate that students with disability experience barriers to developing their employability (Dollinger et al., 2023), while students with a disability or who come from a NESB have reduced PE (Bennett et al., 2022b).

The COVID-19 pandemic created unprecedented and complex challenges for higher education and further highlights the dilemma of student equity (Bassett & Arnhold, 2020; El Masri & Sabzalieva, 2020; O’Shea et al., 2021). The pandemic has widened inequalities and increased the marginalisation of disadvantaged students and will have both medium- and long-term impacts (Rodríguez-Planas, 2022; Smith & Judd, 2020; UNESCO, 2020). For instance, low SES graduates in Australia struggle to find employment and access managerial/professional occupations (Tomaszewski et al., 2021). Higher education institutions must ‘bring an equity lens to every decision’ as they respond to this social, educational and

health crisis (Illanes et al., 2020, p. n.p.) and address challenges including student mental health, employability and the digital divide (O’Shea et al., 2021).

The Australian Government suggests that mental ill health could be considered a new student equity group because there is a significant negative association between accessing mental health services and completing university studies (Department of Education, Skills and Employment, 2020a). Australia is not alone in this regard: a study conducted across eight countries with over 13,000 students (Auerbach et al., 2018) found that the majority of university students reported poor mental health with high levels of stress, anxiety and depression. Indeed, student mental health has received significant scholarly attention in recent years (Cage et al., 2020; Cao et al., 2021; Carter et al., 2017; Cvetkovski et al., 2019; Laidlaw et al., 2016; Wyatt et al., 2017) as university students report higher rates of mental health challenges than their non-university peers (Farrer et al., 2016; Stallman, 2010).

Within Australia, Orygen (2017) estimates that over 210,000 students experience poor mental health each year. As above, research within the Australian context mirrors the findings elsewhere, highlighting the higher prevalence of moderate psychological distress among tertiary students than among non-students (Cvetkovski et al., 2012, 2019; Larcombe et al., 2015; Mulder & Cashin, 2015; Stallman, 2008, 2010). Despite numerous mental health interventions provided to university students, research into the effectiveness of such initiatives is lacking (Reis et al., 2022). There is also a paucity of research that explores how negative mental health impacts efficacy beliefs in terms of study and employability confidence. The lack of evidence on the link between mental health and PE beliefs among equity groups undermines the sector’s ability to design informed initiatives at the institutional or policy level.

Given the Australian Universities Accord Interim Report’s assertion that “the overall goal of reform must be growth for skills through greater equity” (Department of Education, Skills and Employment, 2023, p. 6), the urgency for further research is clear. The study reported here sought to address this gap by investigating the interplay between equity group membership, wellbeing and PE. We begin by expounding the theoretical framework before presenting the research aims.

## Social Cognitive Careers Theory (SCCT)

Given the association between mental distress, academic self-efficacy (confidence in being able to succeed in one’s academic studies) and academic performance, SCCT was a logical framework for this study. SCCT has become an established theoretical framework for studies relating to employability, PE, career choice and academic performance, including within the higher education context. This is largely because SCCT is concerned with the process aspects of career behaviour including career decision-making (Lent et al., 2016), which is socially constructed and made within a triadic relationship between individual characteristics, environmental factors, and behaviours (Conklin et al., 2013).

SCCT emphasises the social construction of efficacy beliefs, which can be thought of as confidence in one’s ability to succeed in a particular domain or situation (Bandura, 1974; Lent et al., 1994). SCCT variants have, over time, considered persistence and performance (Brown et al., 2008); work satisfaction and well-being (Sheu et al., 2020); interest, goals

and performance (Brown et al., 2011; Lent et al., 1994, 2000); career self-management (Lent & Brown, 2013, 2016). (Lent & Brown, 2006; Lent et al., 1994, 2000) and adaptive behaviour (Lent & Brown, 2013).

Multiple PE studies have applied SCCT to the pre-professional domain, considering the impact of socially constructed efficacy beliefs on students' overall PE, which incorporates multiple aspects of study and career confidence. The social construction of career identity considers the influences of proximal factors such as career interest, goals, and actions; distal factors which are the contextual or background factors that influence career decision-making; and the role of psychological capital such as networks, experiences, and of relevance here, students' self-efficacy and resilience (Luthans et al., 2007).

The social construction of career identity can be influenced both positively and negatively: for example, through negative role models and experiences or a deficit of informed careers guidance (Bennett et al., 2022b). There is also an established body of research on the impact of negative experiences on career decision-making and academic performance. As mentioned earlier, research has yet to determine whether and in what ways negative mental health impacts efficacy beliefs in terms of study and employability confidence, although a small number of studies have explored the impact of COVID-19 related stress on student PE and retention (Capone et al., 2021).

While PE is considered more broadly in this study, the dimension of self-efficacy is of particular interest, as it has been identified as 'perhaps the single most important and reliable predictor of university student achievement' (Bartimote-Aufflick et al., 2016, p. 1918). Self-efficacy is known to contribute to goals and actions, both directly and as mediated through outcome expectations: positive expectations and higher self-efficacy promote goal setting, which in turn motivates career exploration and decision making. As Lent et al., (2017, p. 108) explain from the perspective of SCCT, the predictors of adaptive career behaviours are 'the social cognitive variables of self-efficacy, outcome expectations, and goals; personal inputs, such as personality traits; and both distal and proximal contextual influences. Of these, self-efficacy is developed through four main sources of information: enactive mastery; vicarious/observational experiences; social persuasions; and physiological and psychological states (Bandura, 1997).

The notion that psychological state impacts efficacy beliefs (van Dinther et al., 2011) is notable for the current study. The relationship between self-efficacy and academic motivation in higher education has been studied previously (i.e., Pintrich & Schunk, 1996). Less discussed is that whilst self-efficacy impacts motivation, academic grades, and performance (Pajares, 1996; Schunk, 1995, 2003; Svanum & Zody, 2001; van Dinther et al., 2011; Vuong et al., 2010; Zorach & Lipka, 2022), it affects both career aspirations and outcome expectations (Lent et al., 1994; Pham et al., 2020).

## Research Aims

Three research questions guided this study, which explored the links between students' self-perceptions of employability, equity group membership, and wellbeing concerns at a large urban public university in Australia.

- (1) How does membership of equity groups affect perceived employability (PE)?

- (2) How do wellbeing concerns affect perceived employability (PE)?
- (3) How does equity group membership affect wellbeing concerns in students?

Five equity groups were considered: people from low socio-economic status (SES) backgrounds, regional and remote areas, non-English speaking backgrounds, those with a disability, and those identifying as Indigenous Australians. Definitions for all equity groups are based on Australian definitions of equity cohorts and associated reporting by tertiary education institutions. Low SES is based on whether the postcode of each students' permanent home residence is in the lower quartile of postal areas according to the Australian 2011 Socio-Economic Indexes For Areas (SEIFA), specifically the SEIFA Index of Education and Occupation. Regional or remote status is based on the Remoteness Area classification for the postcode of each students' permanent home residence according to the Australian Statistical Geography Standard. Non-English speaking background status was based on whether students came from a home where a language other than English is spoken. Both Indigenous status and disability status were determined based on whether students self-identified as such in response to a corresponding question at the time of enrolment. Further details of how this data is recorded and reported by tertiary education institutions are available via the Tertiary Collection of Student Information website (Australian Government, 2018).

PE is multi-faceted, and so multiple dimensions are evaluated using an existing tool and associated data that has been regularly collected since 2017. The dimensions considered are detailed in the Appendix. Finally, the two measures of wellbeing concerns used are described in the next section. These measures relate to student concerns about mental health and the overall sentiment of responses to questions about students in higher education.

## Materials and Methods

The study employed data derived from a validated self-measure of PE (Bennett & Ananthram, 2022). The following subsections describe the instrument, data collection process, and subset of fields selected to answer the research questions.

### Instrument

The Employ-ability measure (Bennett & Ananthram, 2022) integrates principles of Bandura's (1986) social cognitive theory (SCT) and Lent et al. (1994) social cognitive career theory (SCCT) to create a self-measure of PE across 16 domains of self-, study- and career-confidence (see Appendix). Data collection using the Employ-ability measure has been ongoing in Australia and internationally since 2017. Now an established measure of PE, it has been used in over 30 higher education studies and several doctoral dissertations, including in STEM (e.g., Bennett et al., 2021) and in equity studies (e.g., Bennett et al., 2022a). The complete research dataset includes data from 40 universities internationally and a subset with linked data was used for the study, the parameters of which are described in the following section.

The measure's reliability has been previously estimated using Cronbach's alpha coefficient (Cronbach, 1951), with all constructs having alphas over 0.70 (Bennett & Ananthram, 2022). In addition to PE assessed using Likert-style scales, the measure captures demographic data such as age, sex, and study institution. The measure also includes six optional open questions and a prompt that invites students to write about higher education and the student experience.

## Data Collection

Ethical approvals were established at each institution participating in the research, with the original ethical approval being HRE2017-0125. The Employ-ability measure was delivered to students as an online self-assessment that takes approximately 30 min to complete. The instrument is available without cost. In some cases, it has been integrated into curriculum as a component of a careers-related class; other universities promote its use as an optional activity, and individuals can access it via the website. Users can complete multiple profiles over time, and they can access each profile using their unique log-in details. Users generate a personalised profile report with embedded developmental resources, and they decide whether to include their responses in the research dataset. Users receive an information sheet and an assurance of anonymity, and they complete a consent form. No financial incentive was offered to students.

For the current research, a large Australian university granted ethical approval for existing student responses to be linked with student records using a protocol that protects student anonymity; this information was included in the student consent form. The university, which cannot be named due to the ethical agreement, is a large urban public university located in Australia. The protocol enabled the creation of a linked dataset that includes demographic details, equity information and self-reported data. The study reported here employed 24,329 unique responses from students whose institution provided linked equity information; that is, information on students' membership of the equity groups defined earlier.

To answer the first research question, the analysis focused on the 24,329 unique responses to the instrument and students' corresponding self-assessment along all 16 employability dimensions captured in the instrument. Each of the 16 dimensions are summarised in the Appendix. The dataset for the first analysis also included variables indicating whether students were members of each equity group, and control variables for demographics (age and sex), study load, and year of response. For this first analysis, descriptive statistics regarding students' demographics, year of response, and equity group membership are provided in the 'Equity and Employability Responses' column of Table 1. Descriptive statistics regarding the measures of perceived employability are provided in the 'Equity and Employability Responses' column of Table 2.

To answer the second and third research questions, the analysis focused on the 12,377 responses to the open-ended prompt to 'write whatever you think we need to know about students and higher education'. Responses were excluded if the reply to the prompt was missing, contained only a single word, or had fewer than six characters; this excluded non-meaningful responses such as 'na' or 'abcdef'. Descriptive statistics for this subset with the same variables as before are presented in the 'Open-Ended Prompt Responses' column of Tables 1 and 2.

**Table 1** Descriptive statistics—demographics, study, and equity groups

	Equity and employability responses (n = 24,329)	Open-ended prompt responses (n = 12,377)
Age, mean (S.D.)	22.5 (6.92)	22.65 (7.29)
Sex, n (%)		
Female	15,185 (62.42)	7396 (59.76)
Male	9005 (37.01)	4951 (40)
Other	139 (0.57)	30 (0.24)
Study load, n (%)		
Unknown	2290 (9.41)	58 (0.47)
Part-time	19,410 (79.78)	10,860 (87.74)
Full-time	2629 (10.81)	1459 (11.79)
Year of entry, n (%)		
Unknown	87 (0.36)	0 (0)
2017	177 (0.73)	108 (0.87)
2018	996 (4.09)	490 (3.96)
2019	8032 (33.01)	4051 (32.73)
2020	7084 (29.12)	3024 (24.43)
2021	7923 (32.57)	4680 (37.81)
2022	30 (0.12)	24 (0.19)
English as a second language, n (%)		
No	19,011 (78.14)	9376 (75.75)
Yes	4933 (20.28)	2776 (22.43)
Other/unknown	385 (1.58)	225 (1.82)
Disability status, n (%)		
Disability	1309 (5.38)	727 (5.87)
No disability	23,020 (94.62)	11,650 (94.13)
Socio-economic status (SES), n (%)		
Low SES	3521 (14.47)	1822 (14.72)
Not low SES	17,198 (70.69)	8399 (67.86)
Other/unknown	3610 (14.84)	2156 (17.42)
Indigenous status, n (%)		
Indigenous Australia	231 (0.95)	107 (0.86)
Not Indigenous Australian	20,318 (83.51)	10,196 (82.38)
Other/unknown	3780 (15.54)	2074 (16.76)
Location, n (%)		
Remote	2885 (11.86)	1377 (11.13)
Regional	373 (1.53)	185 (1.49)
Urban	3603 (14.81)	2146 (17.34)
Unknown	17,468 (71.8)	8669 (70.04)

## Data Analysis

### Measures of Wellbeing Concerns

**Table 2** Descriptive statistics—perceived employability and free-text measures

	Equity and employability responses (n = 24,329)	Open-ended prompt responses (n = 12,377)
Perceived employability, mean (S.D.)		
Self awareness (1–6)	4.72 (0.84)	4.75 (0.79)
Program awareness (1–6)	4.98 (0.83)	5 (0.78)
Communication skills (1–6)	4.75 (0.71)	4.78 (0.65)
Digital and technological literacy (1–7)	4.91 (0.87)	4.92 (0.82)
Problem solving and decision making (1–6)	4.57 (0.78)	4.62 (0.72)
Goal-directed behaviour (1–6)	4.5 (0.83)	4.53 (0.78)
Identification with commitment (1–5)	3.91 (0.8)	3.95 (0.77)
Reconsideration of commitment (1–5)	2.56 (1.02)	2.62 (1.02)
Self-esteem (0–3)	2.18 (0.51)	2.19 (0.49)
Academic self-efficacy (1–7)	5.33 (0.91)	5.37 (0.85)
Ability and willingness to learn (1–6)	4.65 (0.83)	4.69 (0.79)
Perceived program relevance (1–5)	4.14 (0.58)	4.16 (0.52)
Career exploration and awareness (0–9)	6.91 (1.44)	6.96 (1.38)
Occupational mobility (0–9)	6.35 (1.65)	6.39 (1.61)
Emotional intelligence (1–5)	3.48 (0.41)	3.5 (0.36)
Ethical and responsible behaviour (1–6)	5.18 (0.74)	5.21 (0.67)
Free-text measures, n (%)		
No mention of ‘mental’	–	11,882 (96)
Mention of ‘mental’	–	495 (4)
Not negative sentiment	–	10,524 (85.03)
Negative sentiment	–	1853 (14.97)

In the data collection tool, the prompt to ‘write whatever you think we need to know about students and higher education’ is open-ended and does not lead students to consider any specific topics, allowing for the emergence of natural themes without bias from leading students towards considering specific issues. Responses to this prompt were used to construct two dichotomous variables that measure the presence of wellbeing concerns (W1) or mental distress (W2):

- **W1** Does the response include the word ‘mental’?
- **W2** Is the overall sentiment of the response negative?

These measures differ in the narrowness of focus and whether mental health concerns must be explicit. The first dichotomous measure, W1, captures whether students think their universities need to consider the mental strain and mental health of students in higher education. Concerns about mental health must be explicit and use the word ‘mental’ for this measure.

The second measure, W2, takes a holistic approach and evaluates whether the overall sentiment of the student response was negative, rather than the presence or absence of specific words. Sentiment is evaluated through standard sentiment analysis methods; each



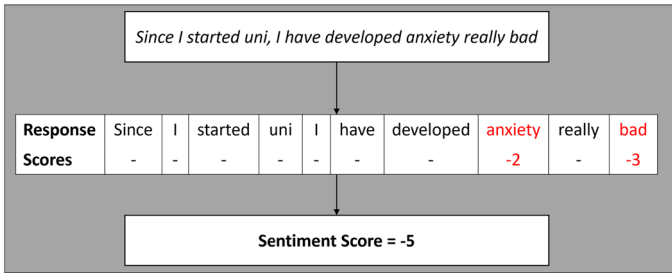


Fig. 1 Sentiment analysis example

word in a response is assigned a positive or negative score based on an established lexicon of word-score pairs; we use the AFINN lexicon (Nielsen, 2011), implemented in the R programming language (R Core Team, 2020) with the *tidytext* package (Silge & Robinson, 2016). The overall sentiment of the response is then computed by summing these scores and we consider whether this value is negative or not, leading to a dichotomous measure. The process of determining the sentiment of a response using a dictionary of word-score pairs is illustrated in Fig. 1.

### Multivariable Analysis

Regression models are used to address each of the three research questions. In all three cases, four control variables are considered in addition to the independent variables of primary interest. Control variables included student age, sex, study load, and year of response. Sex was coded as Male, Female, or Other. Study load was coded as full-time or part-time. Year of response was treated as a categorical variable to allow for year-specific events such as the COVID pandemic.

To address the first research question, 16 linear regression models are estimated, regressing each of the 16 PE dimensions against the control variables and the five dichotomous equity group variables. Given the number of models estimated, equity group membership effects are reported only if they are significant at the 1% level. Formally, the first research question is addressed through the following model, estimated using ordinary least squares:

$$Y_j = X\beta_j^T + \alpha_{1,j}ESL + \alpha_{2,j}Disability + \alpha_{3,j}LowSES + \alpha_{4,j}Indigenous + \alpha_{5,j} \times RemoteOrRegional + \epsilon_j$$

where  $Y_j$  is the  $j$ -th PE dimension, as shown in Table 2 and described in the Appendix.  $X$  is a matrix of control variables and  $\beta_j$  is the corresponding coefficient vector. The effects of interest for the first research question are the  $\alpha$  coefficients corresponding to the effect of being in each equity group on each PE dimension. Lastly,  $\epsilon_j$  is the error vector for the  $j$ -th model.

To address the second research question, the 16 models are re-estimated with the addition of the two dichotomous measures of wellbeing concerns described above (W1 and W2). While this second set of models controls for equity group memberships, they necessarily use a reduced set of data that reduces their relative reliability. Only the effects of the

two measures of wellbeing are reported, and again only if significant at the 1% level. The associated ordinary least square regression models are given as:

$$Y_j = X\beta_j^T + E\alpha_j^T + \gamma_{1,j}W1 + \gamma_{2,j}W2 + \epsilon_j$$

where  $Y_j$ ,  $X$ ,  $\beta_j^T$  and  $\epsilon_j$  are defined as before.  $E$  represents the matrix of binary variables for equity membership and  $\alpha_j^T$  is the vector of corresponding coefficients. Of primary interest for the second research question,  $\gamma_{1,j}$  and  $\gamma_{2,j}$  are the effects of the two wellbeing measures,  $W1$  and  $W2$ , on each PE dimension.

To address the third research question, exploring the potential link between equity group membership and wellbeing concerns, two logistic regression models will be estimated. These two models regress the  $W1$  and then  $W2$  measures of wellbeing concerns against equity group membership and the control variables. Again, the effects of equity group membership will be tested at the 1% level of significance. As the dependent variables in these regressions are binary, logistic regression models are used:

$$W_j = \sigma(X\beta_j^T + \alpha_{1,j}ESL + \alpha_{2,j}Disability + \alpha_{3,j}LowSES + \alpha_{4,j}Indigenous + \alpha_{5,j} \times RemoteOrRegional + \epsilon_j)$$

where  $W_j$  is the first ( $j = 1$ ) or second ( $j = 2$ ) wellbeing measure, and  $\sigma$  represents the sigmoid function:

$$\sigma(x) = \frac{1}{1 + e^{-x}}$$

## Results

The analyses employed for each research question involve the estimation of a large number of regression models. For brevity, only the effects of the independent variables of primary interest for each research question will be reported, with the full set of regression results available in supplementary materials.

### RQ1: Equity Group Membership and Perceived Employability

After controlling for student age, sex, study load, and year of response, the effects of equity group membership on each of the 16 PE dimensions was estimated. Table 3 presents the equity group coefficient estimates for each of the PE dimensions. Effects which were not significant at the 1% level are omitted for conciseness.

Across all PE dimensions, the most consistent effects are associated with the disability and ESL equity groups. Being an Indigenous Australian or having low socio-economic status is rarely relevant, and no significant effects on any PE dimensions were associated with being from a remote or regional location. The significant effects were almost entirely negative, with two exceptions: having English as a second language and having a low socio-economic status were both associated with greater identification with commitment to the

**Table 3** Effects of equity group membership on perceived employability (PE)

PE dimension (range)	Has a disability	English as a second language	Indigenous Australian	Remote or regional location	Low socioeconomic status
Self awareness (1–6)	-0.0796	-0.0843			
Program awareness (1–6)					
Communication skills (1–6)	-0.0544	-0.084			
Digital and technological literacy (1–7)					
Problem solving and decision making (1–6)		-0.0499			
Goal-directed behaviour (1–6)	-0.1853				
Identification with commitment (1–5)	-0.0845	0.0477			0.044
Reconsideration of commitment (1–5)		0.2689			
Self-esteem (0–3)	-0.2135	-0.0455			
Academic self-efficacy (1–7)	-0.1602	-0.1051	-0.1581		-0.0479
Ability and willingness to learn (1–6)	-0.0812				
Perceived program relevance (1–5)		-0.0537			
Career exploration and awareness (0–9)	-0.1135	-0.106			
Occupational mobility (0–9)	-0.3365				
Emotional intelligence (1–5)					
Ethical and responsible behaviour (1–6)		-0.047			

Reported numbers are coefficients associated with equity groups in regression models for each PE dimension. Effects are reported only where p-values are less than 1%

**Table 4** Effects of wellbeing concerns on perceived employability

Employability dimension (range)	Response mentioned 'mental'	Response had negative sentiment
Self awareness (1–6)		–0.0887
Program awareness (1–6)		–0.0833
Communication skills (1–6)		–0.0546
Digital and technological literacy (1–7)		
Problem solving and decision making (1–6)		–0.0578
Goal-directed behaviour (1–6)	–0.1204	–0.0786
Identification with commitment (1–5)		–0.0635
Reconsideration of commitment (1–5)		0.0852
Self-esteem (0–3)	–0.1563	–0.0627
Academic self-efficacy (1–7)	–0.1433	–0.0825
Ability and willingness to learn (1–6)	–0.11	–0.0887
Perceived program relevance (1–5)		
Career exploration and awareness (0–9)		–0.1735
Occupational mobility (0–9)	–0.3532	–0.18
Emotional intelligence (1–5)		
Ethical and responsible behaviour (1–6)		

Reported numbers are coefficients associated with equity groups in regression models for each PE dimension. Effects are reported only where p-values are less than 1%

chosen career path. Interestingly, having English as a second language was also associated with greater reconsideration of commitment, a numerically positive and semantically negative effect.

Of all the PE dimensions, equity group membership most consistently affects academic self-efficacy. The only non-significant effect on this dimension was from the remote or regional equity group, which was not significantly associated with any PE dimensions. No equity groups were found to have significant effects on the program awareness, digital and technological literacy, or ethical and responsible behaviour dimensions.

## RQ2: Wellbeing Concerns and Perceived Employability

To address the second research question about the effects of wellbeing concerns on PE, the two measures of wellbeing concerns are added to the regression models employed to address the first research question. This similarity aims to control for equity group membership and the original control variables, but as noted above is necessarily based only on the subset of responses where students had valid replies to the open-ended prompt. The effects associated with the two wellbeing measures on each of the 16 PE dimensions are reported in Table 4. Again, effects that were not significant at the 1% level are omitted for conciseness, and fuller description of all 16 models, including control variables, is available in the supplementary materials.

**Table 5** Effects ( $e^{\beta}$ ) of equity group membership on wellbeing concerns

Wellbeing concerns	Has a disability	English as a second language	Indigenous Australian	Remote or regional location	Low socio-economic status
Response mentioned 'mental'	1.7779				
Response had negative sentiment					

Reported effects are the exponentiated coefficients associated with equity groups in logistic regression models for each wellbeing concern. Reported effects are interpreted as having multiplicative effects on the odds. For example, an odds ratio of 1.7779 implies that having a disability increases the odds of the wellbeing concern by 77.79%. Effects are reported only where p-values are less than 1%

The results highlight that negative sentiment, without restriction to specific words, is consistently associated with lower PE. The only positive effect is in reconsidering the commitment to the chosen study and career path, which is semantically negative. The explicit mention of 'mental' is less consistently associated with poorer PE but has a larger effect where the association is significant. Again, only a small subset of PE dimensions are not associated with significant effects from wellbeing concerns. These include digital and technological literacy, which was similarly unaffected by equity group membership, as well as perceived program relevance, emotional intelligence, and ethical and responsible behaviour.

### RQ3: Equity Group Membership and Wellbeing Concerns

The final research question considers whether equity group membership increases the likelihood of having explicit or implicit concerns about the wellbeing of students. For this analysis, the two dichotomous measures of wellbeing concerns are regressed in a logistic model against the control variables and equity group variables. For each of the measures of wellbeing concerns, the effects of equity group membership are reported in Table 5 if they were significant at the 1% level. Given the structure of the logistic regression, effects are reported as the exponential of relevant coefficients. These effects should be interpreted based on how they change the odds of having explicit or implicit wellbeing concerns. For example, the effect of 1.7779 means that the odds of students with a disability mentioning "mental" in their reply is 77.79% greater than the odds for students without a disability.

With the exception of the link between having a disability and raising explicit concerns about mental health, no significant links were found between equity group membership and wellbeing concerns. Further, the single significant association is concerning, as having a disability and explicitly mentioning mental health is associated with lower PE along nine and five dimensions respectively. In particular, these factors both affected dimensions corresponding to goal-directed behaviour, self-esteem, academic self-efficacy, ability and willingness to learn, and occupational mobility. Students with a disability may be vulnerable to poorer PE both due to the additional challenges they face in higher education and due to

increased awareness of mental health as a key issue. Given their vulnerability, specific support systems are needed.

## Discussion

The results suggest that students who live with a disability or identify as ESL report lower PE, including self-esteem and academic self-efficacy. Academic self-efficacy was among the most consistently affected dimensions of PE, particularly amongst equity groups. Such findings are concerning, particularly given that within Australia, disadvantaged students have reduced access, participation and employment outcomes relative to non-equity student peers (Bennett et al., 2022b; Tomaszewski et al., 2021) and are simultaneously the focus of higher education growth and reform (Department of Education, Skills and Employment, 2023, p. 6).

As student self-efficacy is strongly associated with student achievement, self-regulation and motivation, and can be increased through teacher intervention (Bartimote-Aufflick et al., 2016), early detection of low self-efficacy is essential. Linking back to SCCT and the social cognitive theory from which it is derived (Bandura, 1986), self-efficacy can be thought of as the 'beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments' (Bandura, 1997, p. 3). Consistent with relative determinism, one's self-efficacy beliefs can better predict performance than one's actual capabilities (Bandura, 1993). Affecting behaviour, thoughts, motivation and feelings, self-efficacy is crucial to effective functioning and academic performance and it can assist students in transitioning effectively into university settings (Morton et al., 2014). Our research finding supports initiatives which are based on SCCT and span the student lifecycle, beginning in the first year of studies (van Dinther et al., 2011).

In our research, students with disabilities were more likely to raise mental health as a concern. This provides an opportunity for critical early intervention and support as young women living with a disability who experience mental health barriers had lower levels of future aspirations (Pham et al., 2020). Other equity groups had no significant positive or negative associations with the two wellbeing measures. The presence of wellbeing concerns using both measures did, however, lead to poorer PE across many dimensions after controlling for all equity groups.

Of interest, the lack of significant relationships between the wellbeing measures and equity groups contrasts with prior reports that both difficulties in transitioning and poor mental health are over-represented among students who belong to one or more equity group (Orygen, 2017). As there are often relatively low levels of help-seeking behaviour amongst students (Grøtan et al., 2019), our findings of negative links between wellbeing concerns and PE indicates it may be valuable for institutions and academics to create mechanisms whereby students can easily and without embarrassment request support when needed to mitigate the issues associated with poor mental health. Students with poor mental health are also more likely to encounter academic impairment (Di Malta et al., 2022; Keyes et al., 2012), poorer relationships, and less engagement with campus life (Hartrey et al., 2017), and they are less likely to complete their degree (Carroll et al., 2020; Vaez & Laflamme, 2008). Poor student mental health is a predictor of dropout intentions and affects self-belief regarding the likelihood of successfully completing a degree (Baalmann, 2023). Although

the causes of mental health challenges are varied (Usher, 2020), the stigma that accompanies mental health is a major cause of discrimination and exclusion (Martin, 2010; Storrie et al., 2010) and institutions have a responsibility to provide supportive environments for all students.

After accounting for equity group membership in our regression analyses, students concerned about mental health or having negative comments about higher education reported lower self-esteem and self-efficacy. Regarding mental health specifically, coefficient estimates indicate a larger mental health effect than equity group effect. The importance of mental health aligns with previous research identifying strong association between mental distress, academic self-efficacy and study progress and the relatively high occurrence of mental health concerns, particularly that ‘among students who reported loneliness, the odds of low academic self-efficacy were approximately 2.6 times higher than those who did not report loneliness’ (Grøtan et al., 2019).

The links between PE and equity status reinforce the need for higher education institutions to support students with disadvantage, heightening retention and helping to set inter-generational welfare recipients on a new path forward (Bubonya & Cobb-Clark, 2021). The link between PE and mental health also reinforces the need for support of student wellbeing more broadly. As disadvantage often limits access to support and resources, employability and related initiatives within the broader frame of study and career confidence can promote social equity if they are embedded within curriculum (Bennett, 2022). While minority groups may be less likely to participate in practical work experience programs, such opportunities improve academic and employment outcomes (Main et al., 2021).

Enabling students to make informed appraisals of their strengths and areas in need of development is essential both to learner agency and engagement, and ‘to highlight areas of agreement, or potential mismatch with perceptions of other stakeholders’ (Donald et al., 2019, p. 611). It is possible therefore that self-assessment measures such as the one employed here might assist students to make ‘more complex and sophisticated expectations of university and of their own roles and responsibilities’ (Hooley et al., 2019; James, 2002, p. 81). Employability initiatives might help to increase resilience, self-connection and wellbeing by preparing students about challenges and stressors they may face during their studies and employment (Emerson et al., 2023) and also communicate the existing services that are available to students as they can be unaware of them.

## Limitations

Several limitations are relevant for this study and provide scope for future research. Firstly, this research used an existing dataset that was not specifically designed to explore equity groups and mental health as its core focus. However, the fact that mental health concerns emerged so significantly from the dataset is a strength of this study as students were not prompted in this regard. While wellbeing measures were constructed using open-ended and non-leading questions, further investigation should leverage validated and well-established measures to add nuanced detail to these findings. Secondly, the student responses underpinning this study were collected at one Australian university and may not be representative of students across Australia or elsewhere. Thirdly, the longitudinal evolution of PE was not considered; this may be relevant in designing initiatives aiming to improve employability

perceptions and student wellbeing. Fourthly, this study did not consider the progression of students beyond university and the translation of PE into tangible outcomes, nor the direction of the relationship between mental health and PE (Baalmann, 2023; Grøtan et al., 2019). These limitations should be addressed in future research aiming to replicate the current work, assess the generalisability of the findings to other contexts (e.g., rural universities), and understand the evolution of beliefs and wellbeing across university study and into career.

Another consideration for further research concerns the distinction between perceived internal employability (individual skills and abilities) and perceived external employability (external factors such as the labour market and university reputation) (Donald et al., 2018; Rothwell et al., 2008). Research that added the dimension of perceived external employability, perhaps through additional survey questions or student focus groups together with labour market analysis, would add considerably to our understanding of PE.

## Conclusion

This study demonstrated the concerning links between equity group membership, mental wellbeing, and perceived employability using data across several years. Amongst students in the Australian higher education system, the findings suggest that students with disabilities, ESL, and wellbeing concerns have lower PE than their peers.

Wellbeing concerns are concerning in their own right, and they are made more so by their increased prevalence for students with disabilities and their deleterious associations with perceived self-esteem and self-efficacy. The long-term effects and potential persistence of these issues are not yet known; however, students' PE can be enhanced by support which positively impacts wellbeing (Petruzzello et al., 2022). Given Doménech-Betoret et al.'s (2017, p. 1194) finding that academic self-efficacy activates student motivation from the 'first weeks of the teaching learning process' and in each new educational setting, the study supports the integration of initiatives within the core curriculum to ensure that all students are aware of and can access meaningful self-development opportunities which heighten both wellbeing and study and career confidence.

## Appendix

See Table 6.



**Table 6** Dimensions in the employ-ability measure

Dimension	Scale	Items (count)	Description
Core literacy: linking self, study and career			
1	Self-awareness relative to career (SA). 2 items informed by Jackson and Wilton (2016)	3	Awareness of employability-related personal strengths and challenges
2	Program awareness	4	Ability to recognise the relevance of learning tasks
3	Linking theory and practice. 3 items from Smith et al. (2014)	4	Confidence in the ability to apply knowledge and skills in professional contexts
4	Self-esteem. Positive wording of Rosenberg (1965): 'Self-esteem'	10	Confidence in one's ability and value
Rhetorical literacy: sophisticated understanding and use of language			
Dimensions 5a, b and c are often reported as a single dimension using a modified version of Coetzee (2014): 'Communication, leadership and teamwork'			
5a	Communication skills	5	Ability to communicate effectively with a range of people
5b	Leadership orientation	6	Ability to guide and influence other people
5c	Teamwork competencies	5	Ability to work with other people
6	Problem solving and decision-making. Coetzee (2014): 'Problem solving and decision-making skills'	8	Ability to solve problems and make informed decisions
Learning literacy: self-beliefs and a learning mindset			
7	Academic self-efficacy. Modified version of Byrne et al. (2014): 'Academic self-efficacy'	26	Confidence in the ability to succeed academically
8	Learning mindset. Coetzee (2014): 'Ability and willingness to learn'	7	Cognitive openness to maintaining their knowledge, skills and abilities (Coetzee, 2014)
9	Goal-directed behaviour	10	Ability to achieve goals through goal-directed behaviour
Career literacy: career identity, exploration and commitment			
10	Career mobility. Lent et al. (2016): decisional coping efficacy	4	Ability to cope with decisional conflict, such as having a career 'plan B'
11	Career identity. Mancini et al., (2015): 'Identification with commitment'	4	Being proud and happy about becoming a professional in the discipline. Identification with career and study path
12	Career and study commitment. Mancini et al. (2015): 'Reconsideration of commitment' (reverse scored)	4	Confidence in current career and study commitment
13	Career exploration and awareness. Lent et al. (2016): Brief decisional self-efficacy	8	Ability to understand and match self-qualities with career and study options

**Table 6** (continued)

Dimension	Scale	Items (count)	Description
Emotional intelligence: understanding and managing the emotions of self and others			
14	Emotional intelligence. Modified version of Brackett et al. (2006)	16	Ability to understand and manage the emotions of self and other people
Ethical literacy: upholding ethical and responsible behaviour			
15	Ethical and responsible behaviour (Coetzee, 2014)	6	Behaving ethically and responsibly
Digital literacy: effective use of digital technologies for work and learning			
16	Digital literacy. 1 item borrowed from Coetzee (2014): 'Communication, leadership and teamwork'	5	Effective use of digital technologies for work and learning

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## Declarations

**Conflict of interest** The authors have no relevant financial or non-financial interests to disclose.

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