

Equity Frontiers Trials Protocol

“The impact of a Widening Participation Model on tertiary applications: A Regression Discontinuity Design”

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1 Trial overview

Trial title:	The impact of a Widening Participation Model on tertiary applications: A Regression Discontinuity Design		
Trial start date:	October 2025	Trial finish date:	September 2026
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Trial summary (<300 words)	Widening Participation (WP) activities are led and delivered by the equity teams within most Victorian universities and aim to reduce barriers to higher education and enable students to access tertiary study. The activities target schools with greater disadvantage, and they provide support to the students to address the barriers that these students commonly face entering higher education. This proposed study leverages the targeting approach to delivering WP activities, notably universities target schools facing the greatest disadvantage, and specifically those with an Index of Community Socio-Educational Advantage (ICSEA) score of approximately 1000 or below. We will use the school's ICSEA score, and this threshold determining eligibility for WP support, to undertake the impact evaluation. As such, we will use a regression discontinuity (RD) design to understand the impact of WP activities, in particular comparing school-level tertiary application rates (our primary outcome) just above and just below this threshold, while using either fuzzy RD or a so-called "donut" RD to accommodate the narrow range of different thresholds used by universities. To undertake this analysis, we will collate publicly available data; these data include school level ICSEA value and variables ("School Profile", Australian Curriculum, Assessment and Reporting Authority [ACARA]), and the percentage of Victorian Certificate of Education (VCE) students within schools that are applying for tertiary places ("Senior Secondary Completion and Achievement Information 2024", Victorian Curriculum and Assessment Authority [VCAA]).		
Ethics approval (grantor, date, reference ID)	Deakin University Human Research ethics, 19 Nov 2025, 2025/HE001200		

2 Background and initiative

2.1 Background

WP activities seek to achieve equitable outcomes. These WP activities broadly seek to engage, support, and encourage individuals from underrepresented backgrounds to see a clear, achievable path into tertiary education, thereby promoting more equitable access to post-secondary education. However, there is limited Australian evidence of WP activities quantified impacts on student application and enrolment into tertiary education.

International research found that WP activities, in particular those that cater to relevant secondary student barriers to higher education, result in 2 to 14 percentage point increases in tertiary enrolments among the student population. More specifically, in the United States (US), Bettinger et al. (2012) found that assisting families with completing the Free Application for Federal Student Aid (FAFSA) led to an 8 percentage point increase in enrolment. Oreopoulos and Ford (2019), in Canada, reported a 14 percentage point increase from workshops on university and financial aid applications, with the largest effects for students not on a university-track. Also in the US, Barr and Castleman (2018) showed that tailored support, including university options, financial aid guidance, and application coaching, boosted enrolments by 10 percentage points. More targeted advising interventions in the US, such as individual career and pathway guidance (Bos et al., 2012) and college information with application support (Bettinger & Evans, 2019), resulted in smaller but still meaningful increases of 3.5 and 2 percentage points, respectively. Finally, Carrell and Sacerdote (2017), also in the US, found that peer mentoring led to a 6 percentage point increase.

2.2 Initiative

In the state of Victoria, the WP Model, as led and delivered by the higher education equity teams, focus on three key aspects of delivery. First, the WP Model targets schools with greater disadvantage and the barriers that these students commonly face entering into higher education (Steps 1 and 2 below). This means that the university identifies disadvantaged schools according to lower ICSEA scores and invites them to take part in a range of WP supports designed to address common barriers disadvantaged students face to engaging with higher education.

The WP Model is school directed (Step 3 below). Rather than prescribing a fixed model, school leaders (e.g. principals and careers advisors) collaborate with the university equity teams to select supports relevant to their current student cohort. This school-directed approach acknowledges that leaders interpret and implement external offerings based on their understanding of students' needs and local priorities. By enabling this local choice and integration into school routines, the model fosters authentic engagement and maximises the relevance and uptake of supports among students. It also maximises opportunities for students who may not typically engage in such supports, and as such, increases the likelihood of the students (who may not otherwise attend) attending WP.

Finally, the WP Model is student-centred. When a school identifies a need for specific support, university mentors are matched to the school, who are selected for their shared backgrounds, age, and when possible, the same secondary school (Steps 4 and 5 below). These mentors, trained to facilitate workshops alongside staff, model success in higher education and support students in navigating their own questions and aspirations. While

support topics vary, the approach aims to build both students' confidence and intention to apply for higher education. We expect that this will result in more applications to higher education.

These key components of the WP Model are further described below.

Table 1: The WP Model

WP Model	Step	Details
School-directed assignment		
Target disadvantaged schools	1	The university identifies disadvantaged schools, specifically selecting them according to those under ICSEA 1000. This approach ensures that schools with the greatest level of disadvantage among the students are provided with the opportunity.
Support options about common barriers	2	The university invites the schools to take part in WP activities, highlighting the range of supports available to their students. These supports address a variety of the known barriers for students to access higher education (e.g. secondary school grades, wellbeing, finances, pathway planning).
School-directed	3	The university and school leaders (e.g. careers advisors and/or principals) then work together to determine the specific supports relevant to their school students (if any). They do this by the school leader reflecting on their current students, and their specific needs in relation to financial barriers, academic preparedness, and/or subject/career knowledge (c.f. the support options). They also then discuss the logistics for delivering the selected workshops to ensure they fit within the existing school activities. It is expected that this school-centred approach maximises engagement amongst the student population.
Student-centred delivery		
Student-centred delivery	4	If the school identifies a need for specific support, the university then identifies university mentors matched to the school, who come from similar backgrounds and age groups, and ideally the same secondary school. These mentors are trained to deliver and facilitate support, often with the support of others relevant to the support topic.
	5	The support is delivered to schools, and mentors model success in higher education, facilitate the workshops, and focus on addressing students' unique questions during the sessions.

The WP support options made available to the schools are specific to each university, while all options are relevant to the barriers faced by disadvantaged students. Further, the WP support also varies by delivery approach, model of delivery, and support themes. Although diverse in options, each engagement is designed to help students see how they can succeed in a pathway towards higher education, through targeting disadvantaged schools, allowing schools to identify supports and then delivering as a student-centred approach.

Delivery approach	Mode	Support themes
• group setting • individual support.	• online • in-school • on-campus.	• academic preparedness (e.g. study skills, wellbeing) • financial barriers (e.g. Special Entry Access Scheme [SEAS], scholarships and costs) • careers and subject aspirations (e.g. prerequisites for subjects, career options, study expectations).

2.3 Objectives

2.3.1 Initiative objectives

The specified WP model aims to increase university applications among students from disadvantaged backgrounds. It does this by reaching disadvantaged students (via targeting disadvantaged school), addressing their psychosocial and structural barriers (via the support topics and school-directed approach), and building students' awareness, confidence, and motivation for higher education through their student-centred support (via the student-centred delivery). These core elements of the WP model are expected to lead to higher rates of tertiary applications, and although beyond the scope of this study, ultimately lead to student acceptance and higher rates of enrolment in higher education.

2.3.2 Trial objectives

The trial estimates the impact of the WP model, which includes a school-directed assignment and student-centred delivery, on tertiary application rates. Given the quasi-experimental design, the estimated impact focuses on the moderately disadvantaged schools, notably including those schools around the threshold for determining eligibility according to the school's ICSEA value.

The following key evaluation questions (KEQs) are addressed:

- KEQ1: What is the impact of a school-targeted and directed WP Model on tertiary application rates in moderately disadvantaged schools?
- KEQ2: What is the impact of a student-centred WP Model on tertiary application rates in moderately disadvantaged schools?

Further, the trial examines the effects of WP delivery, addresses a secondary exploratory question (as data permits):

- EQ3: What are the differential effects of the WP model given university options, such as focus areas, delivery approach, and/or mode?

3 Trial design

3.1 Outcomes

Measure: School's rate of tertiary applications through the Victorian Tertiary Admissions Centre (VTAC) (percentage of Year 12 population) in 2022, 2023, and 2024.

Instrument: VCAA government administrative dataset (published annually).

Approach: The VCAA data are downloaded from the public websites in Semester 1 for each year.

3.2 Trial design

3.2.1 *Type of trial*

The evaluation estimates the impact of the school-directed WP Model on school-level tertiary application rates using a RD. The study exploits the targeting approach used to deliver WP activities across Victoria, whereby universities prioritise secondary schools facing the greatest disadvantage. Eligibility for WP support is typically determined using a school-level ICSEA score at or below an institution-specific threshold, with lower scores indicating greater disadvantage.

3.2.2 *Risk of bias and validity*

Government administrative data are used to estimate outcomes (school-level tertiary application rates) and to collate demographic and contextual information about schools. These data are collected independently of the evaluation and are not generated for research purposes. As outcome measurement and covariates are therefore not subject to researcher or participant influence, the risk of measurement bias is considered low.

A potential complication arises from the assignment mechanism. Eligibility for WP is determined using a school-level ICSEA threshold set by university equity teams, and these thresholds vary across institutions (for example, values of 1000, 1030, or 1040). As a result, the design constitutes a multi-cutoff rather than one governed by a single universal cutoff. However, ICSEA scores are constructed by ACARA, meaning schools cannot manipulate their ICSEA to gain eligibility.

This imprecision in the assignment rule is confirmed through initial interviews with institutions and is addressed analytically through the use of the so-called “donut” RD (Lee and Lemieux, 2010). That is, we drop a small sample of schools with ICSEA score between 1000 to 1030, or 1000 to 1040 (depending upon the information shared in the interviews). Another option is to normalise and centre all thresholds to a common value such as 1000. Moreover, the use of a fuzzy RD design also mitigates the issue as it explicitly models treatment receipt as probabilistic at the eligibility threshold rather than deterministic, allowing consistent estimation of causal effects under standard continuity assumptions.

3.2.3 *Managing confounders*

Tertiary application rates are influenced by multiple factors beyond socio-economic status, for which the school-level ICSEA score serves as a proxy. The primary identification strategy relies on the quasi-random assignment of eligibility at the ICSEA threshold rather than on

statistical adjustment for confounders. Under the RD framework, schools located just above and below the eligibility threshold are expected to be comparable on observed and unobserved characteristics.

To support this identification strategy, observable covariates are examined to assess balance around the cutoff. Covariates are used to improve precision, diagnose potential violations of RD design assumptions, and aid interpretation.

The evaluation focuses on the school-directed WP model (c.f. Table 1). Accordingly, the primary analysis adopts an intention-to-treat approach, estimating the effect of eligibility for WP support at the school level rather than individual student receipt of support. It is recognised that student-level exposure to WP activities may vary within schools.

The running variable (school ICSEA score) and prespecified covariates are sourced from publicly available data provided by ACARA through the School Profile 2024. Additional covariates are derived from government administrative data on senior secondary completion and achievement (see Section 3.3). These data sources are treated as valid and reliable for descriptive and analytical purposes.

Variation in institutional context and program delivery (e.g. WP support themes, mode, and delivery approach) is captured using university administrative data and structured discussions with university outreach teams. These characteristics are used to describe implementation differences across sites and are examined in secondary analyses as potential effect modifiers of impacts on tertiary application rates.

3.2.4 Managing missingness

Missing information is not anticipated with publicly available datasets, and we expect the outcome (tertiary application rates) and running variable (ICSEA) to be complete. Missingness is primarily anticipated in university administrative data used to confirm WP offering and provision. Universities report the schools that were offered support and which of those received it; however, schools not reported may or may not have been offered support. Consequently, treatment assignment cannot be fully observed for all schools.

To answer KEQ1, treatment is defined as ICSEA-based eligibility for WP. All schools are classified as above or below the eligibility threshold, reflecting the approach used by universities to determine equity-focused WP provision. Where universities report offered schools, this information supplements eligibility and can be used to validate the expected offering.

To address KEQ2, which examines the effect of actual WP provision (exposure), analyses focus on schools with confirmed provision data. Schools with unknown provision status meeting the eligibility criteria are recorded as missing, and their characteristics are described in supplementary tables.

3.3 Detailed trial process

The trial process follows a series of steps used primarily to collect, collate, and analyse data. These steps are outlined below.

3.3.1 Collation of government administrative data

The trial team first accesses publicly available government administrative data to establish the analytical base dataset. School-level information is compiled from relevant government

sources, including for years 2022, 2023, and 2024. These government sources, and the relevant data are:

VCAA, [Senior Secondary Completion and Achievement information](#)

- **Percentage of VCE students applying for tertiary places:** The percentage of eligible students at the specified school who made a timely application for a tertiary course through VTAC. This is calculated yearly by the VCAA and published in the Senior Secondary Completion and Achievement Information.
- **Number of students enrolled in at least one VCE or VCE Vocational Major (VM) study or VCE Vocational Education and Training (VET) program at Units level 3 and 4:** The number of students at the specified school enrolled in at least one VCE or VCE VM study or VCE VET program at Units level 3 and 4. This number does not necessarily correspond to the size of the Year 12 cohort at the school. Units at level 3 and 4 are designed to be undertaken in Year 12. However, this estimate will be a proxy estimate of the student population, as the VCE provides flexibility that allows students to undertake some studies at this level before they reach Year 12.
- **Percentage of satisfactory VCE completions:** Of those students eligible to complete the VCE at the school, the percentage of students who did satisfactorily complete the VCE. This percentage is also inclusive of students awarded the VCE VM and the VCE (Baccalaureate). This is calculated by ACARA and is made available as part of the School Profile.
- **Median VCE study score:** The median VCE study score at the school. VCE studies and scored VCE VET programs allow students to receive a study score by completing the necessary graded assessments and satisfactorily completing Units 3 and 4. A study score indicates how a student performed in relation to all other students who undertook the same VCE study or VCE VET program. Study scores are calculated on a scale of zero to 50, with the average study score across the state being 30. Median study score is included as a baseline covariate to improve the precision of the treatment effect estimates and to account for residual variation in outcomes across schools.

ACARA, [School Profile](#)

- **ICSEA:** The Index of Community Socio-Educational Advantage, or ICSEA, is a scale of socio-economic advantage that is computed for each school. It is calculated on family background information of the students and school characteristics and is presented on a scale with a median of 1000 and a standard deviation of 100. ICSEA values typically range from approximately 500 (representing schools with extremely disadvantaged student backgrounds) to about 1300 (representing schools with extremely advantaged student backgrounds). This measure is calculated by ACARA and made available as part of the School Profile.
- **Geolocation:** Categorical indicator of the geographical classification of the school location according to the Australian Bureau of Statistics' (ABS) remoteness classification (Major Cities, Inner Regional, Outer Regional, Remote, Very Remote).
- **Total enrolments:** This includes both full-time and part-time students who are enrolled at the school in the calendar year specified.

School records from the VCAA and ACARA datasets are merged at the school level. Initial matching is conducted using exact school name matching across datasets. Exact matches

are identified using Microsoft Excel's VLOOKUP function applied to the school name variable, and school-level attributes from ACARA are integrated into the VCAA data.

The data collation and cleaning are done as a sequence of decisions, filtering the data as decisions are assigned to each school:

1. **Exact match:** Where school names match perfectly across the two datasets, these relevant ACARA variables are integrated into the VCAA data. For schools that do not match exactly on name, approximate matching is conducted through manual review.
2. **Approximate resolutions:** Records are merged as one school if school name differs only by minor spelling variations, punctuation, abbreviations, or formatting across datasets; and where the school suburb matches exactly across datasets. For these cases, information from the ACARA dataset is merged into the corresponding VCAA record.
3. **Duplicate resolutions:** A subset of schools appear with duplicate or multiple records in one dataset (e.g. separate campuses or locations) but as a single record in the other dataset. These cases are reviewed in consultation with the institutional equity team to determine the appropriate alignment of records. The primary consideration in these decisions is whether the ICSEA value is consistent across campuses and whether all campuses are offered WP support. Where ICSEA values are believed representative of both campuses, and WP offers are consistent for this school irrespective of campus, the ACARA record nominated for the school is treated as applicable to all corresponding VCAA records.
4. **Exclusions:** For schools without corresponding ACARA records, these cases are reviewed in consultation with the equity team responsible for WP delivery to determine the nature of the school and the availability of ICSEA. In particular, this process identifies schools that may not have an ICSEA value reported in ACARA (e.g. specialist or alternative settings). Decisions regarding inclusion, exclusion, or treatment of missing ICSEA values are documented and applied consistently within each year.

All matching decisions are documented in a data cleaning log for each year. This log records the rationale for each decision and supports reproducibility and auditability of the merged dataset. The final merged dataset across three years is used as the analytic dataset for the trial.

3.3.2 *Institutional interviews and cross-institutional data framework*

Following initial government data collation, the trial team conducts structured discussions with equity teams responsible for WP at each of the participating universities that have delivered WP during the three years. Information gathered through these discussions is used to develop a cross-institutional data framework that specifies prescribed variables, harmonised categories, and standardised definitions, as well as a clear process for data extraction and collation across institutions. These discussions serve a priority focus, to confirm each university's eligibility rules and assignment threshold for each of the three years, 2022–2024.

Next, the information informs the development of a coherent, cross-institutional data framework, testing the availability of administrative data relating to WP offering (i.e. intention to treat) and provision (i.e. exposure):

- the year cohorts in which WP support was offered to specific schools over the 2022–2024 period (e.g. years 10–12)
- school-level uptake of WP activities.

Finally, the discussions serve to (qualitatively) document institutional variation in WP provision options. The trial team works with each institution to document outreach delivery options provided by each institution according to:

- **Support focus:** Categorical indicator of the main focus of WP activities available to the school, with categories such as current academic study support; careers and tertiary subject support; other, such as financial and wellbeing.
- **Delivery mode:** Categorical indicator of whether the WP activities are available, for instance, in-person or online.
- **Delivery approach:** Categorical indicator of whether the WP activities are offered whole-of-school/age cohort or targeted students.

3.3.3 *Collation and integration of university administrative data*

Apart from the delivery options relevant to each WP team, the data framework is developed to collate university WP provision information from universities. The requested information includes data from each institution:

- In 2024, was WP support:
 - Available to the school's Year 12 students (Yes/No)?
 - Provided to any of the school's Year 12 students (Yes/No)?
- In 2023, was WP support:
 - Available to the school's Year 11–12 students (Yes/No)?
 - Provided to any of the school's Year 11–12 students (Yes/No)?
- In 2022, was WP support:
 - Available to the school's Year 10–12 students (Yes/No)?
 - Provided to any of the school's Year 10–12 students (Yes/No)?

Once the data framework is finalised, the trial team collates and cleans university administrative data from all institutions in accordance with the agreed specifications. This process is undertaken collaboratively with university outreach teams to ensure that extracted data accurately reflect program parameters and delivery characteristics.

University administrative data are then integrated with the previously collated government administrative school-level dataset, using matching in MSExcel ("VLOOKUP" function). Two members of the trial team jointly manage this process with each institution to ensure data accuracy, consistency, and fidelity to the agreed framework, thereby minimising the risk of bias introduced during data processing.

Any schools for which no outreach activity is identified by any university are reviewed with university teams to confirm whether outreach was not offered, offered but not recorded, or offered by another institution during the period.

3.3.4 *Collation and integration of interview data*

The trial team next add the interview data to the dataset to support the secondary analyses. Specifically, additional descriptive variables are recorded for each school where WP support was provided to characterise the type of support received. For each school, the following indicators are coded as binary (Yes/No), reflecting whether the feature was present in any WP activity delivered to that school:

- Support focus (Yes/No):
 - current academic preparation
 - tertiary subjects/careers focus
 - other (e.g. financial support, wellbeing).
- Delivery mode (Yes/No):
 - in-person
 - online.
- Delivery approach (Yes/No):
 - whole-of-school or year-cohort
 - targeted, individual students.

Where multiple universities provide this same support to the students, the relevant indicators are coded as “yes”.

3.3.5 *Feasibility assessment*

The trial team undertakes preliminary analyses to examine potential threats to internal validity, including:

- manipulation around the ICSEA eligibility threshold
- missing data patterns
- sample size and density of observations near the cutoff
- the presence of multiple eligibility thresholds across institutions
- covariate balance and continuity around the threshold.

Findings from these assessments inform a trial team meeting to review:

- variation in WP delivery models and the feasibility of examining moderators
- completeness and quality of the integrated dataset
- required adaptations to the analytical approach, if necessary.

Based on this assessment, the trial team provides a recommendation regarding the most appropriate evaluation approach to address the key evaluation questions, including whether to proceed with a sharp RD evaluation and whether a fuzzy RD design specification is required.

3.3.6 *Assumption checking and analysis*

The data are read into the statistical software program, Stata, and the *rdrobust* package will be used. Prior to analysis, data assumptions are checked and line graphs are generated to examine scholarship eligibility according to the scores, examining discontinuity across the eligibility threshold for each outcome variable. Distributions of the demographic characteristics/covariates will also be plotted around the threshold to assess exchangeability around this value. For variables with more than two categories, each category will be assessed separately.

Finally, RD will be used to determine the impact of the scholarship program on the primary outcomes using the approach outlined in Section 4.2.

3.3.7 *Sense-making session*

The analysis will be presented to the WP network of equity practitioners as a sense-making session. This two-hour presentation and discussion invites all WP teams in Victorian universities to hear the results from the study, via a hybrid event conducted via Microsoft Teams and in person, at a meeting room in Deakin University (downtown).

The sense-making session invites participants to share their views about (1) anything that is surprising from the findings; (2) any lack of clarity of what the findings means; and (3) what the university could do to help these students. The shared feedback is recorded via pen and paper by the trial team. These will then be summarised for key themes and are used to inform the final reporting of the results (to improve clarity or reexamine data) and suggested next steps in the report.

3.4 Participants

3.4.1 *Research population*

The trial focuses on analysis at the school-level, and applications into tertiary places. Therefore, all schools providing for Year 12 students in the state of Victoria are included in the research population.

3.4.2 *Inclusion/exclusion criteria*

For the RD dataset, all secondary schools in the state of Victoria that provide for Year 12 students during the research period are included in the sample, excluding only schools that did not provide for Year 12 students during this same period and any specialist schools or alternative settings that do not attract an ICSEA score.

In creating data for the dataset (e.g. interviews) and sense-making session, included are all equity team manager or delivery team member of WP in the institutions that delivered WP in Victoria (n=6), excluding any institution that did not deliver WP in Victoria in 2022–2024 (n=3).

3.4.3 *Estimated required sample size*

Based on the overseas literature on similar types of support (Bettinger et al., 2012; Oreopoulos and Ford, 2019; Barr and Castleman, 2018; Bos et al., 2012; Bettinger & Evans, 2019; Carrell and Sacerdote, 2017), we expect a small-to-moderate effect size, ranging from 2 to 14 percentage points in tertiary enrolment rates, with expected higher application rates.

Given the WP activities breadth across a range of barriers, and an initial inspection of the data at ICSEA 1000, we conservatively estimate between 7%–10% increase, increasing from the overall average application rate (from 65% to 72%–75%) representing a moderate to large effect size ($d = 0.32$ to 0.46 , $f^2 = 0.025$ to 0.049). Using standard parameters ($\alpha = 0.05$, $1 - \beta = 0.80$) and a regression framework (F-test for linear multiple regression, fixed model), with one predictor (WP) and three additional covariates, a sample of at least 163 school campuses (~82 school campuses per arm) would be required to detect an effect size (f^2) of 0.049 in a randomised trial. Integrating a design effect estimate relevant to RD with a normal albeit uneven distribution around the threshold ($deff = 2.46$, c.f. Schochett 2008), we would require a sample size of at least 400 school campuses in any year to detect the expected effect sizes for enrolment; we expect even more to apply to university, and therefore we'd require a sample size equivalent, if not smaller than this estimate.

All Victorian secondary schools providing for Year 12 students are included in the dataset, where the treatment group consists of schools that received WP from equity teams, and the control group includes those that did not. While we will select a band around the threshold for the RD design, we anticipate having a sufficient sample to detect a moderate effect size at the cutoff, which we expect to be a reasonable expectation.

3.4.4 *Consent and withdrawal process*

Prior to collecting information from university staff, consent is captured. First, organisational consent is sought from the relevant university and school authorities. This involves providing a Participant Information and Consent Form (PICF), and obtaining written agreement from authorised representatives, which is in this case, the manager of the teams delivering WP activities. Second, individual participants' consent is captured from those delivering WP in universities. All individual participants are provided with the PICF, and the trial team obtains written agreement from each person contributing to the interview.

Interview participants can withdraw from the study prior to the analysis stage of the study without providing a reason, and this will not affect their relationship with their institution or the researchers.

Before data collation/analysis, if a participant withdraws before their interview or before their interview notes are summarised, all data collected from them are destroyed and will not be included in the study. After the analysis begins, it will no longer be possible to withdraw information from the study. Participants are informed of this limitation before providing consent.

Sense-making session participants will not be able to withdraw their shared views, given these will be collected as anonymised comments.

The consent process, including renegotiated consent after sharing interview summaries, ensures that participants are fully informed about their ability to withdraw and the point at which withdrawal may no longer be feasible.

4 Statistical analysis and data management

4.1 Statistical methods

The prespecified primary analysis estimates the effect of WP outreach using a fuzzy RD design. Analyses are conducted separately for each application year (2022, 2023, and

2024), with year-specific tertiary application rates as the outcome. This approach treats each year as a distinct replication of the design.

For each year, treatment is defined as whether a school is offered any WP outreach in that year. These analyses address KEQ1, examining the impact of school-targeted and school-directed WP. To account for imperfect school engagement in WP, a fuzzy RD design similar to Chu, Y.-W. L. & Cuffe, H. (2024) will be used. Due to possible ICSEA thresholds of 1000, 1030, or 1040, we implement a “donut” RD design in which we drop the sample around ICSEA 1000 to 1040. We then estimate the following regression:

$$y_i = \alpha + \beta \times outreach_i + f(score_i) + \mathbf{X}_i\theta + u_i, \quad (1)$$

where y_i is the student application rate for school i ; $outreach_i$ is a binary variable equal to one if school i was offered any WP activities by the university, and zero otherwise; and $f(score_i)$ is a linear or quadratic function of the ICSEA score that accounts for the relationship between the score and the outcome on either side of the threshold. $\mathbf{X}_i$ is a vector of school-level control variables such as school size, location type, and student population achievement (e.g. proportion of students completing VCE). We estimate each instance of Equation (1) using two-stage least squares (2SLS), utilising the ICSEA threshold of 1000 as an instrument:

$$\begin{aligned} z_i &= 1 \text{ if } score_i \leq 1000 \\ &= 0 \text{ if } score_i > 1040 \end{aligned}$$

where z_i is an indicator equal to 1 if school i 's ICSEA score is 1000 or below, and 0 if school i 's ICSEA score is above 1040. The 2SLS estimate of β represents the causal effect of schools offering outreach activities on student application rates, under the assumption that schools cannot manipulate the ICSEA score. This assumption is plausible in our context as the school scores are set by the government.

If all universities submit their data, $outreach_i$ reflects whether the school was offered WP, and Equation (1) is estimated accordingly. If any university does not submit the relevant data, an alternative approach will be applied, using ICSEA-based eligibility as the treatment variable to maintain the validity of the fuzzy RD design analysis. It is expected that nearly all schools below an ICSEA score 1000 or 1040 are offered WP support, but not all schools take up the supports. To capture the different school-level exposure to WP, we estimate the following fuzz RD design regression by 2SLS:

$$y_i = \alpha + \beta \times exposure_i + f(score_i) + \mathbf{X}_i\theta + u_i \quad (2)$$

where $exposure_i$ is a binary variable equal to one if school i takes up any WP support offered by the university, and zero if uptake is confirmed to be absent. Schools meeting the eligibility criteria but with unknown exposure status are treated as missing and are excluded from the estimation of Equation (2). This focus will allow us to address the second key evaluation question, “KEQ2” above, and the examination of student-centred delivery of WP.

To assess the sensitivity, we will try different sizes of “donuts,” e.g., dropping 100 to 1030, 1000 to 1050, etc., as well as conduct robustness checks using 1000, 1030, 1040, separately as thresholds. Note that the results from these separate thresholds are likely downward biased in absolute terms and should be treated as the lower bounds of the treatment effects. Lastly, we may try normalisation and centring the thresholds to a common value.

4.2 Sample cleaning

As described in Section 3, descriptives will be summarised for all variables, helping to identify missingness, anomalies in coding consistency, and data ranges. Count data will be summarised and tabled for each variable category for the full study population. The source of any errors will be identified. We expect spurious data to occur when merging two administrative datasets, as described in section 3. Where spurious data has been identified, these will be corrected to an agreed coding structure if these are confirmed as likely data anomalies. When these confirmations could not be obtained or reasonably assumed (as agreed by the team), these spurious data will be removed.

Accuracy of the university provided data (types of WP support provided) will be confirmed with the equity teams responsible for delivering WP. This will ensure that the coding is correctly transformed from their shared dataset.

4.3 Inclusive and effective sample

Those schools that provide senior secondary education in 2022, 2023, and 2024 are included in the study population. Eligibility for the WP initiative is determined using a school-level ICSEA threshold, with schools at or below the threshold classified as eligible for WP support (intervention group) and schools above the threshold classified as ineligible (comparison group).

While all eligible and ineligible schools form the full study sample, the primary regression discontinuity analyses focus on a restricted analytic sample defined by a bandwidth around the ICSEA eligibility threshold, with causal estimates driven by schools within a specified range of ICSEA scores around the cutoff, rather than by all observed schools.

Bandwidth selection is conducted using data-driven optimal bandwidth proposed by Calonico, Cattaneo, and Titiunik (2014). We will also experiment with several ad-hoc fixed bandwidths as robustness checks.

4.4 Additional analyses

If sufficient data are available, we will further investigate heterogeneous effects of different WP activities as a secondary analysis. Different WP activities are examined by redefining the treatment variable while holding the outcome and running variable constant.

In particular, we estimate the effects of the student-centred delivery WP Model in the following model by 2SLS:

$$y_i = \alpha + \beta \times \text{whole-cohort-delivery}_i + f(\text{score}_i) + \mathbf{X}_i\theta + u_i, \quad (3)$$

where $\text{whole-cohort-delivery}_i$ is a binary variable equal to one if school i receives university support to year-cohorts (rather than individuals), and zero otherwise, for example. By comparing the magnitudes of estimates of β in (2) and (3), we can assess whether the student-centred delivery is a contributor of the treatment effects.

If there are insufficient data available to support this analysis, descriptive analyses are used to examine how outcomes vary across WP delivery features among eligible schools, addressing KEQ3. The analytic sample is restricted to schools that were eligible for WP support and that received at least one form of WP provision in 2024.

Mean tertiary application rates are calculated at the school level and summarised for defined subpopulations. Subpopulations are defined as schools that received:

WP focus

- current academic study support
- career-focused support
- both.

Delivery mode

- in-person support
- online support
- both.

Delivery approach

- whole-of-cohort
- individual, targeted delivery
- both.

Descriptive summaries are presented within narrow ICSEA bands to reduce confounding by baseline disadvantage. Within each ICSEA band and WP feature category, the mean tertiary application rate is calculated as the unweighted average of school-level application rates among schools in that subpopulation. Sample sizes (number of schools) are reported alongside all means.

Uncertainty around descriptive estimates is summarised using 95% confidence intervals. Confidence intervals are calculated using the standard error of the mean within each ICSEA band and feature category, assuming independence across schools.

These analyses are descriptive in nature and are intended to characterise patterns of outcomes across different WP delivery features among eligible schools. Results are not interpreted as causal estimates, nor as evidence of the effectiveness of specific WP features.

4.5 Data management

Human Research Ethics is sought prior to any data collection and collation.

Our collated data includes publicly available and yearly published government administrative data, University WP delivery options, and University WP provision. These data will be combined into one dataset. No person-level details will be stored in any of these files.

The data are stored in the host university's SharePoint and only shared with team members of the project. Data are accessible through password protected digital portals. No other forms of storage are expected to be used for the collected and collated data. There are no physical data storage requirements.

Data are kept for seven years and archived on Deakins SharePoint drive only and will be deleted after this required timeframe.

4.6 Quality control & quality assurance

The process includes a range of quality controls across the delivery. These are:

- Data downloads and collation: Data are collated using school names. All downloads are double-checked—one team member merges the data and a second reviews accuracy and completeness.
- Sample cleaning: Missing data are systematically identified, with handling approaches prespecified (complete-case sensitivity analysis, scenario testing). Spurious data are detected through logical consistency checks and duplicate reviews. Corrections are only applied following confirmation of coding errors or anomalies; unresolved anomalies are removed.
- Statistical assumption checks: Prior to analysis, covariate distribution checks are conducted around the score threshold to confirm exchangeability; graphs and discontinuity plots are generated for key outcomes and covariates.
- Sense-making sessions: data will be presented back to WP teams to test the face-validity of the findings and to provide further insights and contextual meaning to the results
- Reporting: Trial results are summarised in an ACSES Trial Report and only reports that meet ACSES quality standards are published in the Trials Registry.
- Data management: Person and organisation de-identified and password protected copies of final datasets are stored should they need examining after review.

5 Publication

The plan to publish the trial results is as follows:

- Protocol and final report are made publicly available on the ACSES Trials Registry.
- Presentation and discussions of results at student equity conferences and associated peer-reviewed journals.

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7 Appendices

7.1 Plain Language Statement

Plain Language Statement

Date: 22 October 2025

Full project title: The impact of a Widening Participation Model on tertiary applications: A regression discontinuity design

Principal researcher: Nathan Coffey

Associate researcher(s): Jessica Foster, Patricia Vermillion Peirce, Luke Chu

Funding: The research project has been funded by the Australian Centre for Student Equity and Success (ACSES)

Dear widening participation practitioners and leaders,

We are conducting the following research to understand the impact of Victorian universities widening participation model on tertiary applications.

What is the study about?

This study aims to understand how effective the Widening Participation (WP) model has been in supporting students from moderately disadvantaged schools in Victoria to apply for higher education.

The WP model used by Victorian universities provides a range of activities tailored to student needs and school contexts. These activities are typically not one-off workshops or expensive individual mentoring, but rather a suite of targeted engagements designed to address common barriers to higher education.

The study will examine whether schools that received WP support had higher tertiary application rates than similar schools that did not, focusing on schools with an ICSEA (Index of Community Socio-Educational Advantage) score just above and below ICSEA 1000. For this reason, we need to engage with Victorian Universities, to understand which secondary schools received (and didn't receive) WP during 2022–2024.

The research questions:

- What is the impact of a school-targeted and directed widening participation model on tertiary application rates in moderately disadvantaged schools?
- What is the impact a student-centred widening participation model on tertiary application rates in moderately disadvantaged schools?
- What are the differential effects of this model given institution and/or institutional options, such as focus areas, delivery approach, and/or mode?

Who is doing the study?

This study is being conducted by:

- Nathan Coffey and Jess Foster, Deakin University

- Dr Patricia Vermillion Peirce, Australian Centre for Student Equity and Success (ACSES)
- Dr Luke Chu, Victoria University of Wellington

This study has received Human Ethics Advisory Group (HEAG) approval (reference number: 2025/HE001200).

Why am I being asked to join?

You have been invited because your university delivered WP activities to secondary schools between 2022 and 2024.

This information will help assess how WP support was distributed and its relationship to tertiary application outcomes.

What will we need to do?

First, we are seeking **organisational consent** for your organisation's participation in the study. This will likely be one person with the authority to provide consent, such as a member of Equity Team management or similar.

Next, involvement includes an initial **2-hour interview** with the Equity team (or individuals) delivering WP and the project research team to begin understanding how WP is delivered. Questions will include, for example: WP options and themes, school selection for WP, school uptake, and engagement. We will also use this discussion to work towards collating data, building a common coding framework, and setting up variables needed. These interviews will be conducted on the university campus with your WP team, in a meeting room designated by your team, and we will take notes during the interview (i.e. no recording).

Following this interview, we will ask an individual within your team to complete a **spreadsheet capturing data** on which secondary schools participated in WP activities from 2022–2024. This will include data on:

- Which schools were offered WP support over this period
- Uptake of WP activities by those schools and year groups (years 10–12)

The research team will collate this information across all Victorian universities. Institutions will be deidentified and coded before analysis. This data will not be shared with anyone outside of the nominated research team, for this project purpose.

- At the end of the study, participants will be invited to an optional hybrid in-person/online discussion (via MS Teams or in a meeting room at Deakin University downtown, up to 2 hours), as a group “sense-making” discussion. This session will present preliminary findings, and offer a chance to share reflections or contextual insights.

Attendance and participation in the discussion is voluntary. The shared views will be summarised for key themes, and any comments will be de-identified in all records and reports.

Are there any risks or costs?

There are no foreseeable risks in participating. All institutional data will be de-identified, and individuals will not be named in any outputs. However, as the small-group interviews and group discussions involve professional discussions among colleagues, there is a minor risk

of sensitivities that may arise from discussing work-related experiences. To minimise this risk, participating and sharing any views is voluntary.

Participation involves only time commitment for the interview and data provision. We will also contact you in future to invite you to a session at which we will seek your feedback on the results and collect this data.

There is no cost to you or your institution.

What are the possible benefits?

The findings will provide sector-wide insights into:

- The effectiveness of WP activity targeting.
- How universities can allocate limited WP resources most effectively to support equity in tertiary access.

Your contribution will help build a shared understanding of what works in WP delivery across the Victorian context.

Payment

There will be no formal payment for engaging with the project, but universities WP teams who do participate will receive a small in-kind gift for their participation.

How will my, and my institution information be kept confidential?

All information you provide will be stored securely and treated confidentially.

- Institutions will be deidentified and coded before analysis, notably each institution will be assigned a unique code; no names or identifiers will appear in analysis or reports.
- All data will be stored on Deakin University's secure, password-protected network drive.
- Only the research team will have access to the identifiable data.
- Data will be kept for seven years after publication, then permanently deleted.

If required, Deakin University's Research Portfolio staff may access the data for ethics or compliance audit purposes. All data handling will follow Australian privacy laws and Curtin and Deakin University ethical standards.

Can I see the results?

Yes. Findings will be shared with all participating universities through a collective briefing session and summary report. Aggregated results may also be presented at academic conferences or published in journals. No institutions or individuals will be identified in any public materials.

Do I have to take part?

No. Participation is entirely voluntary. You can choose not to take part, or to withdraw at any point before the data are aggregated for analysis. You, and your institution's decision will not affect your relationship with your institution, Deakin University, or ACSES.

Can I, and my institution withdraw?

You may withdraw your consent and discontinue participation at any time without disadvantage. If you choose to withdraw, any information you have provided will be removed from the dataset and not included in the analysis, unless it has already been de-identified and included in aggregated findings; at this stage it is no longer possible to withdraw. In other words, institution may also withdraw their data at any stage before analysis begins.

What should I do next?

If you wish to participate, please complete the attached consent form and return it to the research team. If you do not wish to participate, you can ignore this invitation or contact the team to opt out at any time.

Complaints

If you have any complaints about any aspect of the project, the way it is being conducted, or any questions about your rights as a research participant, then you may contact:

The Human Research Ethics Office, Deakin University, 221 Burwood Highway, Burwood Victoria 3125, Telephone: 9251 7129, research-ethics@deakin.edu.au

Please quote project number [2025/HE001200].

Who can I contact for more information?

If you have questions, contact: <insert PI>

7.2 Interview guide

Introduction

Purpose: The purpose of today's discussion is to understand how your institution's Widening Participation (WP) activities were delivered to schools between 2022 and 2024. We'll be documenting what types of WP options were available to Years 11–12 students, which schools were offered and received WP support, and how schools were targeted according to the ICSEA ≤ 1000 threshold.

This session will also help us design a common data framework that allows all institutions to provide their WP data in a consistent format, which we will share with you and then collate data across institutions.

We will take notes but will not record audio for the interview. Notes will be de-identified before analysis. Participation is voluntary, and you can choose not to answer any question or stop the interview at any time.

1. Do I have your consent to proceed with the interview?

Institutional context

2. Which team(s) lead WP delivery to schools?
3. Has your institution's WP approach changed between 2022 and 2024? If yes, how?

WP options and themes (Years 11–12)

4. What types of WP activities were available to Years 10–12 students between 2022 and 2024?
5. How would you describe your delivery mode (on-campus, in school, online, mix)?
6. What were the main themes or objectives of your WP offerings? (academic support, financial, wellbeing, career/subject focused)

7. Were some activities designed specifically for certain year levels (11, or 12)?

School coverage (2022–2024): Identify which schools were offered and received WP support, and by year level.

8. Over the past three years (2022–2024), how did your institution decide which schools were offered WP support?
9. Were there any differences in how support was offered across years or school types (e.g. regional vs metro, government vs independent schools)?

Assignment threshold and targeting: Examine the use of ICSEA thresholds and any exceptions.

10. Was the ICSEA ≤ 1000 threshold consistently used to determine school eligibility for WP?
11. Were there instances where schools above the threshold were included? If so, what were the considerations?
12. Would you say this targeting approach remained consistent across 2022–2024?

School uptake and engagement: Understand school response and participation patterns.

13. What factors influenced school uptake of your WP offers?
14. Are there barriers you've noticed that prevent schools from engaging in WP?

Data structure: Refine and agree on a shared data framework.

15. Based on your records, are the following variables feasible to report for each school?

Year	Year level	Was WP support available to a specific school?	Was WP support provided to a specific school?
2024	Year 12	Yes/No	Yes/No
2023	Year 11	Yes/No	Yes/No
2023	Year 12	Yes/No	Yes/No
2022	Year 10	Yes/No	Yes/No
2022	Year 11	Yes/No	Yes/No
2022	Year 12	Yes/No	Yes/No

16. Would additional variables (e.g. region, school type, delivery mode) help contextualise your WP data?
17. Are there any issues or challenges we should consider in aligning your data to this framework?

7.3 Sense-making session guide with Widening Participation Network

Introduction

1. Welcome

Thank you for joining us today.

2. Summary of approach and purpose of the study

We undertook a study to understand how effective the Widening Participation (WP) model has been in supporting students from moderately disadvantaged schools in Victoria to apply for higher education.

3. Purpose of the sense-making session

The purpose of the sense-making session is to share the results with all universities that deliver WP in Victoria, and who may be interested in learning about the evaluation results. We also want to provide an opportunity for existing WP teams to offer insights as to the reasons for the specific findings (what do these findings mean to you?)

4. How any shared information will be used

We are not recording the session, nor are we recording who takes part. We will summarise the insights shared as part of our discussion, and these (anonymised) points will be summarised in the final report.

5. Provide an opportunity to ask any questions

Does anyone have any questions before we begin?

Sense-making guide

6. WP activities

<summary of the diversity of WP provided to secondary schools>

7. Study design

A regression discontinuity design (RD design) was used to estimate the impact of the Widening Participation (WP) Model on tertiary application rates, focusing on the commonly applied threshold for university equity-led support, and this was the Index of Community Socio-Educational Advantage (ICSEA) cutoff of 1000. Those around the threshold are moderately disadvantaged schools.

Administrative data were used to calculate tertiary application rates, defined as the percentage of Victorian Certificate of Education (VCE) students at each school who apply for tertiary places through the Victorian Tertiary Admissions Centre (VTAC). The running variable (ICSEA score) and covariates (school size, socio-economic status in the bottom Socio-Educational Advantage [SEA] quarter, and geolocation) are drawn from the Australian Curriculum, Assessment and Reporting Authority (ACARA) School Profile. Variations in how the WP Model is implemented across institutions were captured through university administrative data and discussions with outreach teams, with these differences to be explored as potential effect modifiers in secondary analyses. As not all Victorian universities apply this threshold uniformly, a fuzzy RD design model was used, allowing estimation of the effect of outreach support on schools just below the ICSEA cutoff compared with those just above it.

8. Study findings

<TBC>

9. Questions to group

We'd like to ask you, as WP teams:

- Is there anything that surprises you from these findings?*

- *Are there any findings that don't make sense to you?*
- *What about the context of these schools or university WP provision could have influenced these results?*
- *What could the university do to help these students the most?*