Student Attrition in Higher Education

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Characteristics of Australian higher education providers and their relation to first-year student attrition

Dr Lin Martin
Commissioner
Aim of the project

- To identify characteristics of higher education institutions which are associated with high levels of attrition
- How these characteristics might assist in identifying potentially high risk institutions and actions which might address these high levels of attrition
Data used in the project

• Institutions were included in the study if a first-year attrition rate was available for the most recent reporting year (2014)

• In total, 173 institutions were registered in March 2014 with 18 of these not having data from which to calculate attrition rates

• 155 institutions were considered for the study (130 HEIMS and 25 PIR institutions)

• Only HEIMS institutions were used (130)
Definition of first-year student attrition

• First-year attrition is defined in TEQSA’s Risk Assessment Framework (RAF) as

  The number of first-year commencing students (higher education only) in a year who neither complete nor return to study in the following year as a percentage of the total commencing students

• Attrition includes both undergraduate and postgraduate, and domestic and international first-year students

• Raw attrition rates used and not the adjusted rates which appear in the our risk assessments for some providers
Distribution of risk-rated providers by risk category for first-year student attrition 2012-2014

- Large proportion of providers are high or moderate risk in terms of attrition – polarised distribution, slightly worsening in the last three years

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of rated providers</th>
<th>% High risk</th>
<th>% Moderate risk</th>
<th>% Low risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>153</td>
<td>41.8%</td>
<td>16.4%</td>
<td>41.8%</td>
</tr>
<tr>
<td>2013</td>
<td>153</td>
<td>40.5%</td>
<td>21.6%</td>
<td>37.9%</td>
</tr>
<tr>
<td>2014</td>
<td>164</td>
<td>40.2%</td>
<td>22.0%</td>
<td>37.8%</td>
</tr>
</tbody>
</table>
Diversity of the sector

- Considerable diversity of the institutions in the sector and wide range of attrition values across 130 providers
- Half the providers have attrition rates of 25% or higher, one quarter have rates higher than 32%
- On average non-university providers have higher rates of attrition than the universities
Attrition rate by provider 2014

Upper Quartile, Attrition = 0.315
Median, Attrition = 0.250
Lower Quartile, Attrition = 0.163
Finding the characteristics associated with high attrition

• First tried multivariate regression model for whole sector
• Not a very good fit
• Could do better by segmenting the sector
• Used **Hierarchical Cluster Analysis** with 17 discriminator variables
• Cluster analysis is an exploratory process
• Produces groups which have more in common than differences between them
A four segment solution for the Australian higher education sector
Description of clusters

• Clusters can be defined according to their profile
• Average values used for each segmentation variable
• Differentiating variables are those with average at least twice the values for the same variable in the other clusters
The segments

• Cluster analysis resulted in four groups:
  • **Universities** public and two private universities (39)
  • **Small providers** with high percentages of external, part-time and postgrad students; Society and Culture; mature aged entrants (these are the mainly the faith-based institutions) (27)
  • **Medium sized providers** focused on international students, Management and Commerce, and students with prior VET studies (23), and
  • **Medium sized institutions** large percentages of undergraduate domestic students across a range of fields (these are the TAFEs, pathway and for-profit providers) (41)

• Then fit a multivariate model to each cluster
Attrition rates by cluster

Cluster 1
- Min: 0.10
- Max: 0.32
- Median: 0.1800

Cluster 2
- Min: 0
- Max: 0.58
- Median: 0.2700

Cluster 3
- Min: 0
- Max: 0.51
- Median: 0.2050

Cluster 4
- Min: 0.02
- Max: 0.44
- Median: 0.2800
Explanatory Models of Attrition for the Defined Clusters

- Significant variables

<table>
<thead>
<tr>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>Cluster 3</th>
<th>Cluster 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>External +</td>
<td>Postgrad –</td>
<td>Full time acad staff –</td>
<td>VET +</td>
</tr>
<tr>
<td>EFTSL –</td>
<td>Progress –</td>
<td>VET +</td>
<td>PartTime +</td>
</tr>
<tr>
<td>VET +</td>
<td>External +</td>
<td>Age –</td>
<td>Full time acad staff –</td>
</tr>
<tr>
<td>Senior Academic –</td>
<td></td>
<td></td>
<td>Senior Academic –</td>
</tr>
<tr>
<td>Postgrad –</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj Rsquared 86%</td>
<td>Adj Rsquared 33%</td>
<td>Adj Rsquared 57%</td>
<td>Adj Rsquared 58%</td>
</tr>
</tbody>
</table>
Findings

• There are explainers of attrition that are specific to certain segments of the Australian higher education sector
• Some explainers of attrition are affecting the Australian higher education sector across several segments: VET, Senior academic staff, external enrolments, full time academic staff
• Analysis does not reveal any strong link to ATAR values in universities or in other clusters
• No link to low SES, none to mature aged entry, though this does appear as a weak explanatory variable in the model for the whole sector
• OECD latest stats show Australia’s completion rates are at about the OECD average (70%) and behind the UK (83%) and the US (79%)
The future

• Report points a way forward for consideration of attrition by TEQSA

• Good explanatory models for each of the clusters (particularly clusters 1 and 4) which are intuitively reasonable

• An institutional approach to the understanding of attrition is a good way forward for TEQSA and to develop future policy about attrition and its importance to the performance of the sector
A response to *Characteristics of Australian higher education providers and their relation to first-year attrition*

Professor Pip Pattison  
DVC Education, University of Sydney
Outline

1. Why does institution-level analysis add value?
2. What *can’t* we conclude from this study?
3. What have we learnt?
4. What next?
Why does institution-level analysis add value?

• Additional analysis, additional evidence
• Many strategies to reduce attrition are set and implemented at institutional level
• The HESP analysis in *Improving retention, completion and success in higher education* shows that institutions are a major source of variation in modelling attrition at student level
• Understanding institutional heterogeneity is therefore important
  • exploratory analysis of heterogeneity illuminates its nature
  • exploratory analysis of attrition rates by institutional cluster identifies both common and distinctive relationships across clusters
What can’t we conclude from the study?

The study identifies relationships between institutional characteristics and institutional attrition rates, but we need to note that:

• we cannot infer causal relationships between institutional factors and institutional attrition rates

• we cannot conclude that there are corresponding correlations at the individual student level (ecological fallacy)

• the entire population of institutions is included in the analysis

• some important factors are almost certainly missing from the analysis (e.g. per EFTSL expenditure on student services?)

• the analysis is exploratory
What have we learnt?

• Higher education provider heterogeneity

• Some relationships are identified as potentially important at institutional level
  o EFTSL, Postgraduate, SeniorAca
  o External, PartTime
  o VET (basis of admission)

• Many relationships are identified as potentially not important at institutional level
  o Median TES
  o SSR, Agreement (CEQ)
  o FTEmployment (GDS)
  o SES

• Important variation of relationships across clusters
What next?

1. Understand attrition in its full multi-level complexity
   • student level *and* institutional level characteristics are likely to matter
   • conceptual models of attrition/degree completion point to multilevel explanations and the importance of longitudinal designs that incorporate time-varying factors (e.g. Chen, 2012)
Example 1: A conceptual model for degree completion (Oseguera and Rhee, 2009)

**Student level**

- Student background
- Student experiences
- Student attitudes
- Environmental pull

Individual probability of persistence to degree completion

**Institutional level**

- Student peer characteristics
- Structural demographic characteristics
- Psychological dimensions of retention climate
- Faculty perceived campus environment

Institutional climate

Average institutional probability of persistence
Oseguera and Rhee (2009) findings

Data
- 37,006 students in 170 US four-year colleges and universities
- Cooperative Institutional Research Program freshman survey (1994)
- Six-year degree completion (2000)

Modelling
- Hierarchical generalised linear models for six-year degree completion

Findings
- Student level effects: race, SES, financial concern, high school GPA, SAT, living on campus, intent to transfer
- Student composition effects: high school GPA, institutional selectivity
- Structural demographics
- Faculty-perceived campus climate environment
- Institutional retention climate

% variance explained
- 58.2%
- 65.1%
- 65.3%
- 69.1%
What next?

2. Consider the role of program level factors and strategies (and explore heterogeneity within institutions)

3. Focus efforts on understanding the impact of promising interventions, e.g.
   
   • analytics-based engagement interventions such as the *Student Relationship Engagement System*
   
   • ‘values affirmation’ interventions of Cohen, Harackiewicz and others
Thank you

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Cited literature


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Friday 27 October 2017, Sydney
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