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The influence of geography on engineering employability and implications for undergraduate curriculum design

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A common outcome of recent investigations internationally into graduate employability has been a list of desired (particularly by business) generic skills and attitudes that university graduates should have when they complete their undergraduate studies in order to maximise their employment opportunities. However, there is evidence that a ‘degree plus a list of key skills’ model does not fully explain the observed variability in graduate employability, and that other factors external to a student’s experience of university study contribute to graduate employment status. For engineering graduates, employment outcomes, as measured by the national Graduate Destination Survey, vary significantly depending on the institution that a student studied at. Simple employability models that focus on employment status immediately post-graduation and lists of ‘employability skills’ fail to fully characterise graduate employability, or account for the variability of graduate outcomes between institutions, even in the time when there is essentially a universal focus on graduate employability skills in higher education curricula. Internationally, it has been identified that geography plays a role in engineering employment opportunities. The research presented here investigates the impact of geography on professional and graduate engineering employment opportunities in Australia, and identifies implications for undergraduate engineering curricula. While the specific context and findings here relate to engineering, the analysis methods employed are likely to provide useful insights in many disciplines.

Keywords: engineering education, curriculum design, occupational outcomes

Introduction

In Australia, for many years, engineering graduates have enjoyed both relatively high commencing salaries (Graduate Careers Australia, 2016b) and relatively high rates of full-time employment (Graduate Careers Australia, 2016a). Figure 1 shows that graduates in nearly all engineering disciplines identified by Graduate Careers Australia (GCA) in the annual Graduate Destination Survey (GDS) have achieved better employment outcomes than the average of all Australian graduates over a sustained period of time. Norton and Cakitaki (2016) note that the number of engineering jobs in Australia rose steadily from 2003 with the mining boom, as did enrolment numbers in engineering programs. Engineering jobs peaked in 2013 and have declined markedly since, and while recent applications for engineering study have also declined, the student pipeline means that numbers of completing engineering students have remained high, leading to the general decline in graduate employment outcomes from 2013 apparent in Figure 1. While engineering education has traditionally been viewed economically as ‘low risk’ and having good returns for the investment made (Saks & Shore, 2005), Engineers Australia (2012a) note that variations in Australian engineering employment outcomes send “confusing signals for individuals, especially given the long duration of formal and professional training expected of engineers” (p. 9-10).
Figure 1: Engineering graduates working full-time as a proportion of those available for full-time employment – based on data from Graduate Careers Australia (2016a)

Not surprisingly, universities are generally very interested in graduate employment outcomes, as they are one of the objective measures used to produce higher education league tables. Related to this, is the very topical concept of graduate ‘employability’. Employability is rarely explicitly defined, but generally relates to the “propensity of students to obtain a job” (Harvey, 2001, p. 98). The general connection between higher levels of educational attainment and higher levels of employment is clear (Teichler, 2009), but the operationalisation of employability is often in the form of a ‘magic bullet’ model, where universities provide particular opportunities that enable students to develop ‘employability’; however, employability development is much more complex than this in reality (Harvey, 2001). Researchers have noted that many factors beyond what a university does to, does for, or requires of, students influence professional success and employment outcomes, including social/cultural capital, genetically determined abilities, the socio-economic value of the qualification obtained, the transition from study to employment, and ongoing education and professional development (Teichler, 2009). Harvey (2001) notes “there is a range of factors that mediate the employment process, irrespective of the opportunities afforded learners in their undergraduate programme of study” (p. 103). Factors identified here include: type of higher education institution; mode of study; student location and mobility; subject area studied; previous work experience; age; ethnicity; gender; social class; and the activities of graduate recruiters.

Harvey (2001) above identified ‘student location and mobility’ as a factor contributing to higher education employment outcomes generally. For engineering, internationally, ‘location’ has been identified as a significant factor affecting employment outcomes. Using census and other national data, Rothwell (2013) observed that in the USA, science, technology, engineering and mathematics (STEM) jobs that require at least a bachelor’s degree are highly clustered in certain metropolitan areas. In the UK, both a geographic variability in the distribution of people with STEM skills (Holt, Johnson, & Harrison, 2011), and in the distribution of the availability of STEM employment (Mellors-Bourne, Connor, & Jackson, 2011) have been observed. Engineers Australian (the Australian national professional
engineering body) noted that “the demand and supply of engineers has geographic dimensions, depend on the field of engineering required and depend on the skill level and experience required in an engineer” (Engineers Australia, 2012b, p. 13). This paper uses Australian national data sets including the census, higher education course completions, the GDS and the Australian Bureau of Statistics (ABS) longitudinal statistical data set ‘6227.0 Education and Work’, to characterise the impact of geography on employment outcomes for Australian engineering graduates, and identifies implications for undergraduate engineering curricula.

Method

To identify the geographic distribution of people in Australia working in a professional engineering role, the ABS census online TableBuilder service (Australian Bureau of Statistics, 2016) was used to cross-tabulate those respondents in the most recent Australian national census (in 2011) that reported being in a professional engineering occupation versus their reported significant urban area (SUA) of the respondent residence. The census data include 477 occupational classifications, including 11 that are clearly related to professional engineering. SUAs are geographical units of 10,000 people or more used by the ABS to describe the physical distribution of the Australian population. To identify the geographic distribution of people in Australia holding an engineering bachelor-level qualification, The ABS TableBuilder service was used to cross-tabulate those respondents that reported a bachelor-level degree in engineering versus their reported SUA of residence. To identify the number and state-based distribution of completing engineering students in 2010 (who would be graduates in 2011), national course completion data were obtained from the Department of Education and Training web site (Department of Education and Training, 2015). To examine current engineering graduate employment outcomes, data were obtained from the Quality Indicators for Learning and Teaching (QILT) website (Social Research Centre Pty Ltd and Commonwealth of Australia, 2016). To investigate state-based engineering workforce outcomes, historical data on state engineering labour markets reported by Engineers Australia were consulted (Engineers Australia, 2012a). Matching historical engineering graduate employment outcomes were obtained from the Good Universities Guide publication (Hobsons, 2012).

There are some limitations with the data thus collected. Census data depend on both the response accuracy of those completing the census, and the choices made by those coding those responses into the census database. The Australian census only asks respondents for their highest qualification. A respondent with an engineering bachelor qualification who has also completed any graduate qualification (i.e., a master of business administration – not uncommon in engineering), is probably not recorded as having an engineering qualification. Graduate employment outcomes reported by the QILT website and the Good Universities Guide are derived from the GDS administered by GCA. Graduate employment data are not publicly reported for an institution if the overall student response rate to the GDS at that institution is less than 50 per cent, resulting in incomplete engineering graduate employment outcomes for some states. The state engineering labour market data reported by Engineers Australia were provided by the ABS, based on their longitudinal statistical data set 6227.0 Education and Work which is derived from a national survey, and is hence subject to survey sampling errors. With these limitations in mind, we can consider the results in detail.
Results and discussion

Based on the 2011 census data, Table 1 presents the proportions of people (as a number per thousand out of the total population) reporting working in a professional engineering occupation for:
- SUAs in Australia grouped by region (state, territory, other) and all Australia (minimum, maximum, median and ratio of maximum to minimum); and
- all Australia as a whole.

On the same basis as Table 1, Table 2 presents the proportions of people reporting a bachelor level degree in engineering or related technologies.

Table 1: Proportion of people (per thousand) in professional engineering roles in SUAs

<table>
<thead>
<tr>
<th>Region</th>
<th>Max.</th>
<th>Min.</th>
<th>Median</th>
<th>Max/Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW</td>
<td>13.8</td>
<td>0.8</td>
<td>3.1</td>
<td>18.1</td>
</tr>
<tr>
<td>VIC</td>
<td>8.2</td>
<td>1.9</td>
<td>3.3</td>
<td>4.4</td>
</tr>
<tr>
<td>QLD</td>
<td>13.0</td>
<td>1.5</td>
<td>3.6</td>
<td>8.8</td>
</tr>
<tr>
<td>SA</td>
<td>8.2</td>
<td>0.6</td>
<td>1.9</td>
<td>13.7</td>
</tr>
<tr>
<td>WA</td>
<td>16.4</td>
<td>1.4</td>
<td>6.8</td>
<td>11.7</td>
</tr>
<tr>
<td>TAS</td>
<td>4.5</td>
<td>1.6</td>
<td>2.4</td>
<td>2.8</td>
</tr>
<tr>
<td>NT</td>
<td>6.6</td>
<td>2.1</td>
<td>5.9</td>
<td>3.1</td>
</tr>
<tr>
<td>ACT</td>
<td>6.3</td>
<td>0.8</td>
<td>3.1</td>
<td>8.3</td>
</tr>
<tr>
<td>Other</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
<td>1.0</td>
</tr>
<tr>
<td>All Aust. (SUA)</td>
<td>16.4</td>
<td>0.6</td>
<td>3.1</td>
<td>27.4</td>
</tr>
<tr>
<td>All Aust. (Total)</td>
<td>6.5 per thousand</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Proportion of people (per thousand) with engineering bachelor degrees in SUAs

<table>
<thead>
<tr>
<th>Region</th>
<th>Max.</th>
<th>Min.</th>
<th>Median</th>
<th>Max/Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW</td>
<td>13.1</td>
<td>1.2</td>
<td>3.4</td>
<td>10.6</td>
</tr>
<tr>
<td>VIC</td>
<td>12.8</td>
<td>1.5</td>
<td>4.0</td>
<td>8.4</td>
</tr>
<tr>
<td>QLD</td>
<td>13.5</td>
<td>1.9</td>
<td>5.0</td>
<td>6.9</td>
</tr>
<tr>
<td>SA</td>
<td>9.0</td>
<td>1.4</td>
<td>2.2</td>
<td>6.6</td>
</tr>
<tr>
<td>WA</td>
<td>18.9</td>
<td>2.3</td>
<td>6.1</td>
<td>8.0</td>
</tr>
<tr>
<td>TAS</td>
<td>6.5</td>
<td>2.8</td>
<td>2.9</td>
<td>2.3</td>
</tr>
<tr>
<td>NT</td>
<td>7.8</td>
<td>2.4</td>
<td>5.8</td>
<td>3.2</td>
</tr>
<tr>
<td>ACT</td>
<td>9.7</td>
<td>6.8</td>
<td>8.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Other</td>
<td>3.6</td>
<td>3.6</td>
<td>3.6</td>
<td>1.0</td>
</tr>
<tr>
<td>All Aust. (SUA)</td>
<td>18.9</td>
<td>1.2</td>
<td>4.1</td>
<td>15.3</td>
</tr>
<tr>
<td>All Aust. (Total)</td>
<td>9.3 per thousand</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1 and 2 show clearly that the geographic distribution of both engineering jobs and people with engineering qualifications vary significantly in Australia – by a factor of nearly 30:1 for the former and more than 15:1 for the latter, based on SUAs. Geography is important for general engineering employability. Based on the overall values of 6.5 people per thousand working in a professional engineering role, and 9.3 people per thousand having an engineering bachelor degree, it can be inferred that there are significantly more qualified engineers than there are professional engineering roles in Australia. Other research using 2011 census data has shown that more than 40 per cent of those people working in a professional engineering occupation do not have a bachelor (or higher) qualification in engineering (Palmer & Campbell, 2016). This means that the actual number of professional engineering roles available to qualified engineers is significantly less than the 6.5 per thousand indicated by the raw census data. In Table 1 and 2 it can be seen that the overall proportions of both engineering jobs and people with engineering qualifications is significantly higher than (more than double) the median national values based on SUA. This suggests that there are a small number of large population SUAs with relatively high proportions of engineering jobs and people with engineering qualifications. In a recent overview of the Australian engineering profession it was noted that that “The engineering labour force is concentrated within major urban areas in each jurisdiction” (Engineers Australia, 2015, p. 77). Here ‘jurisdiction’ refers to state or territory.

Taken together, these indicators suggest that the bulk of engineers and engineering employment opportunities will be located geographically in the capital city of the respective state or territory. To explore the influence of capital cities on engineering work and qualifications, Table 3 draws on the 2011 census data for the numbers of people reporting working in a professional engineering occupation and the number of people reporting a bachelor level degree in engineering. To incorporate new engineering graduates from the same time period, Table 3 also includes data on numbers of completing domestic engineering students from 2010 (and who would hence be graduate engineers at the time of the 2011 census) (Department of Education and Training, 2015). For each of these three groups, and for each region (state, territory, other) and all Australia, Table 3 shows:
- the total number of roles/engineers/graduates in the region;
- the number of roles/engineers/graduates in the capital city of the region; and
- the proportion of the total roles/engineers/graduates in the region present in the capital city of the region.

Table 3: Concentration of engineering roles, engineers and graduates in capital cities

<table>
<thead>
<tr>
<th>Region</th>
<th>Total engineering roles</th>
<th>Total BE graduates</th>
<th>BE graduates 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Capital</td>
<td>% Cap.</td>
</tr>
<tr>
<td>NSW</td>
<td>41860</td>
<td>29807</td>
<td>71.2%</td>
</tr>
<tr>
<td>VIC</td>
<td>35290</td>
<td>30085</td>
<td>85.3%</td>
</tr>
<tr>
<td>QLD</td>
<td>27470</td>
<td>18504</td>
<td>67.4%</td>
</tr>
<tr>
<td>SA</td>
<td>8748</td>
<td>7743</td>
<td>88.5%</td>
</tr>
<tr>
<td>WA</td>
<td>22029</td>
<td>19245</td>
<td>87.4%</td>
</tr>
<tr>
<td>TAS</td>
<td>1573</td>
<td>905</td>
<td>57.5%</td>
</tr>
<tr>
<td>NT</td>
<td>968</td>
<td>630</td>
<td>65.1%</td>
</tr>
</tbody>
</table>
Table 3 indicates that, in all cases a majority, and in most cases a significant majority, of the engineering roles, qualified engineers and new engineering bachelor graduates in Australia are located in the capital cities of states and territories.

Prima facie, there are differences in engineering graduate employment outcomes between universities. An examination of the current (2016) graduate employment outcomes data provided by the QILT website (Social Research Centre Pty Ltd and Commonwealth of Australia, 2016) (itself derived from the three most recent years of employment outcomes data from GCA) shows graduate full-time employment rates, consolidated for all engineering programs at a university, varying between 60.7 and 96.2 per cent (those seeking work: 3.8 to 39.3 per cent). Closer examination of the results for all 31 universities reporting engineering graduate employment outcomes data via QILT reveals no immediately obvious relationship with geography. Between universities within a given capital city the difference in engineering graduate employment rates can be wide, and within a particular state the difference in engineering graduate employment rates between regional and capital city universities can also be wide, in some cases in a positive direction and in other cases negative. Tracking engineering graduate employment outcomes data for previous years reveals similar results.

So, while significant research indicates that engineering employment is strongly linked to geography, the observed wide variation in engineering graduate employment rates means that it is not possible to establish a straightforward reliable relationship between the engineering graduate employment outcomes for a particular university and available potential predictor variables. However, the finding that engineering jobs and graduates are largely concentrated in the capital cities of all states and territories suggests a new way to consider engineering graduate employment outcomes. Once reasonable commuting distances are considered for graduates, it is likely that, on average, 90 per cent or more of all Australian engineering graduates are seeking employment in what is effectively a single job market in their respective home state or territory. Table 3 indicates that for some states/territories that this proportion is already 100 per cent of graduates. In such a scenario, engineering graduate employment rates of individual universities have less importance, and certainly less predictability, and it may be more relevant to consider the overall effective engineering graduate employment rate for each state or territory. Using the available reported annual engineering graduate employment rates for all universities in a particular state/territory, weighted by the fraction of the total number of domestic engineering graduates in that state that each university accounts for, it is possible to derive (sum) an overall effective engineering graduate employment (and unemployment) rate for each state or territory – see Figure 2 below.

For a number of years up to 2012, Engineers Australia published a report on state engineering labour markets for the previous year – for example (Engineers Australia, 2012a). Using custom sets of data supplied by the ABS, derived from the ABS longitudinal statistical data set 6227.0 Education and Work, the Engineers Australia reports provided information on the engineering workforces in major state markets, including the engineering population, the engineering labour force, the number of employed engineers and the number of unemployed engineers. The 6227.0 data set allowed the ABS to estimate these engineering workforce numbers for Victoria, New South Wales, Queensland and Western Australia in 2011 – the remaining states and
territories were too small to permit the derivation of separate data sets from the underlying ABS national statistical data set. Table 3 shows that Victoria, New South Wales, Queensland and Western Australia combined account for approximately 90 per cent of engineering roles, qualified engineers and new engineering bachelor graduates in Australia, so any model that can shed light on structural factors in engineering graduate employability for these states will have wide impact and utility. Using the engineering labour force numbers and number of unemployed engineers tabulated in Engineers Australia (2012a), it was possible to compute an annual 2011 engineering unemployment rate for Victoria, New South Wales, Queensland and Western Australia – these are indicated in Figure 2 below.

Using the final ABS/Engineers Australia data set for the state engineering labour markets in 2011 (Engineers Australia, 2012a) and the reported engineering graduate employment rates for the corresponding time period (Hobsons Pty Ltd, 2012), Figure 2 scatterplots the weighted state average fraction of engineering graduates seeking work versus the unemployment rate for state engineering labour marker for the four major state engineering markets. Figure 2 also includes a linear regression model line based on the data, and the x axis has an expanded scale for clarity.

![Figure 2: Weighted average state engineering graduate unemployment versus state engineering unemployment rates](image)

While the data in Figure 2 include only four points and cover only about two percentage points range in state engineering unemployment rate, the significance of the linear regression model is $p = 0.073$ and the model accounts for approximately 86 per cent of the variation observed in weighted average state engineering graduate unemployment rate. Figure 2 suggests a significant relationship between overall engineering graduate employment rates and the corresponding general engineering employment rates in the major Australian state engineering labour markets. In one sense, this finding should not be too surprising, as engineering graduates are one component of a state’s engineering employment market, albeit a relatively small one. Additionally, if it is harder (or easier) to find engineering work in a particular state, it’s not unreasonable to expect that it might be commensurately more difficult (or easy) for a graduate engineer to find engineering employment. However, the linear regression model suggests that
the engineering graduate employment is particularly sensitive to changes in the general engineering job market – with a one percentage point change in the general engineering unemployment rate being associated with a greater than 12 per cent change in engineering graduate employment prospects. The Engineers Australia report on state engineering labour markets mentioned above (Engineers Australia, 2012a) also included the figure reproduced here with permission as Figure 3.

![Figure 3: Comparative engineering employment growth in Australian states 2001-2011 – reproduced with permission from Engineers Australia (2012a, p. 9)](image)

Figure 3 is based on data in the report, and shows the relative growth in engineering employment over the period 2001-2011 for the four major states (Victoria, New South Wales, Queensland and Western Australia), the rest of Australia, and for all of Australia (Total Engineering). Figure 3 shows all states commencing at an index level of 100 in 2001, with the vertical scale then showing percentage changes over time compared to the 2001 level. While the Total Engineering lines shows relatively steady growth in engineering employment of about 50 per cent for all of Australia over a ten year period, it can be seen that for some states there are significant swings in engineering employment growth over time, both positive and negative, and that there are also significant differences between states.

**Implications for engineering curriculum design**

It is clear that in understanding Australian engineering graduate employment outcomes that geography is very important. Engineering employment opportunities vary dramatically across the country, the majority of opportunities are located in capital cities, and graduate employment outcomes make the most sense when engineering job markets are considered on a whole-of-state basis. Taken on a state-wide basis, graduate employment is approximately proportional to the general engineering employment market for that state. There may be significant difference in engineering employment opportunities between states, and the relative inter-state engineering employment rates are dynamic over time. Models of, and curriculum approaches
to, engineering graduate employability that don’t take into account the observed structural geographic distribution, scale, and time dynamic characteristics of engineering employment in Australia are likely to be less effective than those that do, and to have difficulty explaining their outcomes and impact. For those involved in professional practice education aspects of the undergraduate engineering curriculum, a comprehensive account of the history, philosophy and practice of the profession in contemporary Australia is incomplete without addressing the impact of geography of engineering employment prospects.

For those with an interest and/or responsibility for graduate employability, designing an undergraduate engineering curriculum that engages students with the impact of geography on where and how they might work post-graduation is essential. With a few exceptions, the best opportunities for graduate employment will be close to capital cities. Students could be set the task of exploring the variation of professional engineering roles in a region/state using the census data, with the class collectively crowdsourcing a map of the relative engineering employment opportunities in the relevant region(s). Other more timely and/or discipline-specific data on job opportunities in different locations might be harvested by students from online job advertisements.

For some students, improving their opportunity for engineering graduate employment may mean moving from their home or current location. Previous research into engineering graduate mobility in the UK (Atkinson & Pennington, 2012) and Australia (Department of Education Employment and Workplace Relations, 2009) has indicated that many engineering graduates are reluctant to change their geographic location for work. Engaging students with the impact of geography on graduate employment prospects during their studies may assist them to approach the potentially difficult question of whether they should plan to relocate for work. At least they would be better informed when making such a significant decision. The evidence presented here is that it is at the scale of state engineering labour markets that graduate employment outcomes are best explained. Graduates compete with their peers from their own institution, and others in the same state for a generally large, but fixed, pool of employment opportunities. The intensity of the competition can be increased, but the ultimate number of jobs is essentially static. Depending on the comparative strengths of state engineering labour markets at the time, the practical decision for students might include not just moving elsewhere in the state, but potentially interstate as well.

The ultimate geographic limits in Australia are the borders of the nation itself. A forward-looking undergraduate engineering curriculum would introduce students to the possibility of international engineering practice post-graduation. The Washington Accord (International Engineering Alliance, 2016) is an international agreement between the bodies responsible for undergraduate engineering program accreditation within its signatory countries for the mutual recognition of undergraduate qualifications between those countries. In addition to Australia, current Washington Accord signatory members include Canada, China, Taiwan, Hong Kong, India, Ireland, Japan, Korea, Malaysia, New Zealand, Russia, Singapore, South Africa, Sri Lanka, Turkey, UK and USA. There may be additional licensure requirements for practice in those countries, but an accredited Australian undergraduate engineering degree is recognised for entry into the profession in those countries. International students who obtain their undergraduate engineering degree in Australia may return home (or go elsewhere) to practice. Domestic students may get an initial exposure to the possibility of international practice via curriculum elements such as a study semester abroad, an international work integrated learning placement or an international study tour. Should such international experiences focus on Washington Accord countries? It has been suggested that engineering studies should provide
French engineers with at least one language other than French to be able to operate effectively, given the international nature of their practice (Crolet, 2007). The interconnected nature of Europe clearly makes multilingualism valuable, but what additional languages would be most valuable for Australian engineering graduates to have, and how could their acquisition be incorporated into undergraduate engineering curricula?

A metaphorical geographic limit of engineering employment is the boundary created by existing engineering employment opportunities. As noted above, there are significantly more qualified engineers than there are professional engineering roles in Australia. Many graduates will have to find work outside of the professional ‘geography’ of engineering if they wish to work at all. As noted above, employment outcomes for engineering graduates have historically been good, though more recently in decline. Other research indicates that only around half of recent engineering graduates are working in an engineering role (Palmer, Tolson, Young, & Campbell, 2015). There is a balance required for a contemporary undergraduate engineering curriculum to ensure adequate technical preparation for those students who pursue a career in their discipline as professional engineers, and to also address the broader knowledge, skills and attitudes that will equip the many of the graduates from Australian engineering programs for successful employment outside of engineering using their engineering and general knowledge and skills.

Concluding remarks

The most current Australian census data is from 2011, so now somewhat dated. The public release of the 2016 census data will provide an opportunity for aspects of the findings here to be tested for consistency. Figures 1 and 3 indicates that state and national engineering labour markets are dynamic in nature – another reason to seek the most up-to-date data. Alternative, more immediate sources of engineering employment data could be explored, such as those available via online employment sites and social media platforms. Given the international mobility and employment opportunities afforded to Australian engineering graduates via the Washington Accord, there would be value in investigating the comparative engineering employment rates in signatory countries. There is a question then for curriculum designers how such information might factor into the international experiences offered to students.

The model developed linking aspects of state-based engineering graduate employability to general state engineering employment levels does not claim to explain engineering graduate employment completely. Perhaps its main contribution is to confirm that engineering graduate employability is linked to external structural influences, including geography, beyond the direct influence of universities and employability skills development initiatives. Certainly, failing to appreciate and account for such external factors and their dynamics will leave those with a responsibility for graduate employability with a larger unexplained variance in their graduate outcomes than would otherwise be the case. The findings here point to a need to engage both Australian engineering students and curriculum administrators with the impact of geography on engineering graduate employment outcomes. They suggest that Australian engineering students, and educators, would do well to study some ‘geography’ in addition to science and technology.

While the specific context and findings here relate to engineering, the data sources used and analysis methods employed are likely to provide useful insights in many disciplines for those with responsibility for higher education curriculum design and enactment.
References


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