From Data Entry to Evidence-Based Decision-Making: How Data and Analysis Can Drive Improvements in Admissions Policies

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Abstract

Academic standards and performance outcomes are a major focus of the current Cycle 2 Australian Universities Quality Agency (AUQA) audits. AUQA has clearly stated that universities will need to provide 'evidence of setting, maintaining, and reviewing institutional academic standards and outcomes' (2010, p. 27). To do this, universities will need to have accurate and extensive data and analysis and will need to show how such data are used to drive improvement in standards across the institution.

At the same time, the government's response to the Bradley review encourages and provides opportunity for universities to grow and diversify. However, the Hon Julia Gillard, Minister for Education, has explicitly stated that 'if we have equity targets we must have quality targets' (2009, p. 1), and so while growth is expected, academic standards must not be compromised.

Admission policies, programs and entry requirements will therefore play a growing role in meeting these objectives. Monash recruits students from a diverse range of educational and social backgrounds. The university has eight campuses, including two overseas and one in regional Australia, and a student population of which more than a third are international. Within this context, it is essential that admission standards are equitable and lead to comparable academic performance of students from a vast range of entry pathways.

The Office of Planning & Quality at Monash University has therefore developed an extensive suite of processes for data collection, preparation and analysis to inform admissions-related decision-making. This article will outline the work undertaken to collect, prepare and disseminate a detailed set of admissions data that identifies the entry pathways and academic outcomes of the university's bachelor students. The resulting analytic work is also outlined and the statistical techniques used to assess equivalences between different qualifications are described. Finally, the use of this analysis by senior management to inform decision-making is also discussed.

Keywords: Academic standards, entry requirements, university admissions, administrative data, AUQA.

Background

Admissions policies and practices that are equitable, transparent and 'fit for purpose' are an important tool for maintaining and improving university academic standards. Part of ensuring quality teaching and learning outcomes is the selection of a student body that has a reasonable chance of success. As such, it is a requirement within the 'Guidelines for Establishing Australian Universities', which sit under the *National Protocols for Higher Education Approval Processes*, that each institution 'has student admission policies and procedures which ensure that students are selected through open and fair processes and which are based on maintaining academic standards and maximising the likelihood of students succeeding in their studies' (Ministerial Council on Education, Employment, Training and Youth Affairs, 2007, p. 16). This requirement is further reflected in subdivision 19–35 of the *Higher Education Support Act 2003* (Cwlth) (p. 24) which states that 'benefits and opportunities must be available equally to all students' and requires universities to select students on the basis of merit with scope to take into account educational disadvantage to ensure that values of social inclusion are also upheld (subdivision 19–35).

Academic standards and performance outcomes are also a major focus of the current Cycle 2 Australian Universities Quality Agency (AUQA) audits. AUQA has clearly stated that universities will need to provide 'evidence of setting, maintaining, and reviewing institutional academic standards and outcomes' (2010, p. 27) and have released a framework to provide direction for how this can be achieved. Under the learning and teaching component of this framework, admissions policies and practices and their relationship with student academic performance have been highlighted. The focus is on entry requirements, processes for recruitment and selection, progress and retention of students and equity outcomes (2010, p. 95).

It is therefore increasingly important that universities have admissions policies that are transparent and well documented, support the making of consistent admission decisions and select those students that are the most likely to succeed. This can be extremely challenging, particularly in a sector that draws upon a diverse range of applicants. For many institutions, particularly Monash where 35% of students are international (Department of Education, Employment and Workplace Relations [DEEWR], Higher Education Student Data Collection, 2009), applicants need to be assessed on the basis of a wide range of qualifications and tests.

Additionally, the government's response to the Bradley Review of Higher Education has been to encourage and provide opportunity for universities to grow and diversify through the setting of general and low socioeconomic participation targets and through the introduction of 'student-centred funding' (DEEWR, 2009) that will effectively remove limits on the number of Commonwealth supported places. James, Bexley and Shearer (2009) have argued that to respond to this challenge, universities will need to develop new student selection practices that utilise multiple selection criteria such as aptitude tests and interviews to supplement the use of Year 12 results. However, while growth is expected, any move to grow and diversify student populations through the use of new selection tools or other changes to admissions policies must not compromise academic standards. As such, the Hon. Julia Gillard, then Minister for Education, has explicitly stated that 'if we have equity targets we must have quality targets' (2009, p. 1).

Universities can only really ensure that their admissions policies maintain high academic standards if they have research and evidence to support their decision-making.

Institutions need to know what selection tools are best suited to their circumstances and aims and, in particular, understand how an applicant's educational background relates to subsequent academic performance.

There is a vast range of literature that can assist universities in this decision-making. For example, institutions wishing to review their admission processes in light of James et al.'s recommendation to use multiple selection criteria can look to research into the predictive nature of Tertiary Entrance Ranks (ENTERS, now known as the ATAR) on university performance to better understand when the use of the ENTER may be optimal and when other tools might be more suitable. Some of this work suggests that the ATAR may best used for selection into highly competitive courses as ENTERs above 80 are strong predictors of university performance (Dobson & Skuja, 2005, p. 55), but within the 40–80 ENTER range there is a much weaker relationship (Murphy, Papanicolau, & McDowell, 2001). Similarly, universities are able to look to the work of Birch and Miller (2007) to understand the predictive nature of aggregate ENTERs compared to individual subject marks, or to the analysis of Green, Brown and Ward (2009) to see how Year 12 science subject results relate to university performance in anatomy, physiology and biomechanics. This literature can inform decision-making around the need for prerequisite subjects or the usefulness of providing subject bonuses where the Year 12 subject curriculum is similar to the university course curriculum.

In the context of improving participation among students from disadvantaged backgrounds, research into relationships between selection tools, socioeconomic status and academic performance may be useful. Work showing that Year 12 outcomes improve with socioeconomic status (Birrell, Rapson, Dobson, Edwards, & Smith, 2002, p. 14; James et al., 2008) highlight the challenge of increasing participation among students from disadvantaged backgrounds when Year 12 results are the main selection tool. Similarly, research showing that Year 12 results can overreflect academic ability among students from independent schools (Dobson & Skuja, 2005, Naylor & Smith, 2002) can assist universities in finding ways to compensate for disadvantage. Similarly, the findings of McDonald, Newton and Whetton (2001) that selecting students on both the A Level results (i.e. Year 12) and the Scholastic Assessment Test (SAT) in combination might improve participation among students from disadvantaged schools can also assist universities in choosing new selection tools, while universities looking to develop new admission pathways can look to evaluations of Monash's Diploma of Tertiary Studies (Levy & Murray, 2005).

While published literature can point universities in the right direction, differing applicant profiles, qualifications and backgrounds coupled with specific strategic objectives and course offerings mean that institutions should not just base decisions on external research. To enable best practice decision-making institutions require their own internal data and analysis that is specific to their circumstances.

It is within this context that the University Statistics (US) department at Monash University, with the help and support of the Admissions Unit and International Recruitment Services, has developed a full suite of data that is used to develop, monitor and review Monash's admissions policies. This article will outline the work that has been undertaken in recent years from the collection of data through to analysis that provides evidence for strategic decision-making. It is hoped that it will provide institutional researchers in other universities with ideas on how they too can proactively expand their suite of data to support important decision-making.

Identifying and Filling the Data Gap

Around 2006, University Statistics identified a growing need for comprehensive, easy-to-access admissions data to assist senior management decision-making. Requests for information on how the educational background of the university's students related to their academic performance were increasing in number and complexity, but the data available to answer these questions were either not available or hard to access.

In the past, data provided to the unit by the Victorian Tertiary Admissions Centre (VTAC) had been sufficient. However, in response to a growing international student body (including overseas campuses in Malaysia and South Africa), and the development of direct pathways (e.g. the Monash College Diploma), increasing numbers of students were being admitted outside of the VTAC system. While the DEEWR student submission data provided some basis for admission data, it was clear that these files needed to be supplemented to allow for the analysis required. This led to University Statistics conducting a needs analysis to identify gaps between the available data and the analysis needs of senior management. This work discovered that the following information was required but not readily available:

- English language pathway (e.g. International English Language Testing System [IELTS] test, previous studies in English) and score
- previous qualification and relevant results (e.g. A Levels, university degree, TAFE diploma)
- previous school/institution
- key pathways such as Monash College, Monash University Foundation Year (MUFY).

Interrogation of the university's student system (Callista™) identified that key pathway data could be extracted as students enrolled in these programs were being recorded on Callista™. However, data that would fill the other gaps were not consistently recorded on Callista™ and so processes needed to be developed to collect this information electronically.

With the assistance of the university's central admissions unit, faculty representatives and International Recruitment Services (responsible for the admissions for most of Monash's onshore international students), University Statistics commenced work on developing guidelines and a work instruction document for entering detailed basis for admission information onto Callista™. This work included identifying exactly what data items were required, as well as providing advice on where and how these data could be stored on the university's student system to maximise data quality and accessibility.

When developing these guidelines a number of important considerations had to be made. Some of the key considerations were as follows:

- The costs of collecting each piece of data were weighed against the benefits. Data items were only made mandatory if it was foreseeable that it would be used for analytical or 'auditing' purposes.
- Data had to be collected in a form that required minimal 'cleaning' so, where possible, free text fields are avoided by ensuring adequate 'pick lists' are available for data entry staff.
- The collection of information was aligned with Monash's admission policies to ensure that data are available to assess each key entry requirement.

As a result of this work, the university now requires that detailed previous qualification/basis for admission data are recorded on Callista™ for all direct coursework admissions. The following types of information are collected:

- previous secondary qualification (e.g. type, score, country, school)
- previous tertiary studies (e.g. level, institution, country)
- English language tests and scores
- prerequisite subjects.

Data Extraction and Preparation

Once the issues around the collection of the data were resolved, University Statistics were able to tackle the task of pulling together all of the available data into one file that would allow for flexible and in-depth analysis. The most pressing requirement was for data on the admission pathway and subsequent performance of students starting a Bachelor's Pass degree and so a Bachelor's Pass admissions dataset was developed.

Most of the analysis and reporting undertaken in University Statistics utilise the Higher Education Student Data Collection files that are submitted to DEEWR (DEEWR data). The unit prepares two main files from these submissions: a unit of study file (i.e. one row per student per unit enrolment), and a course of study file (i.e. one row per student per course enrolment). These files are also supplemented with extra information about the course and the student, including marks and grades.

Given this, it was decided to continue to use DEEWR data as the base for preparing a Bachelor's Pass admissions dataset. A complex extraction, transform and load (ETL) process was then written using Statistical Package for the Social Sciences® (SPSS) syntax to merge in data from a range of sources including the VTAC masterfile, Callista™ admissions records and Callista™ enrolment records. Figure 1 below outlines where all of the data are sourced from and how they are merged into one file.

Previous Australian Secondary Qualification

Source: Callista Admission Records

Key Fields: Qualification name, result, school name, year, completion status

Primary Key for matching: Student ID.

Previous Overseas Secondary Qualifcation

Source: Callista Admission Records

Key Fields: Qualification name, result, country, year, completion status

Primary Key for matching: Student ID.

Previous Tertiary Qualification

Source: Callista Admission Records

Key Fields: Institution name, Country, level, Latest year of enrolment, completion status

Primary Key for matching: Student ID.

Key Pathway - Monash College, MUFY, Sth Africa Foundation Year

Source: Callista Enrolment Records

Key Fields:course name, location, marks, progress rate, commencement date, completion date

Primary Key for matching: Student ID.

Previous Monash University Student and Diploma of Tertiary Studies Key Pathway

Source:DEEWR submission data from the two years proceeding the Bachelor's Pass commencement year

Key Fields: Course name, course type, campus, faculty, latest enrolment year

Primary Key for matching: Student ID.

DEEWR Student Data

Commencing Bachelor's Pass course enrolments (2005-2009)

VTAC

Source: VTAC masterfile

Key Fields: Application year, enrolment status, school name and state, school sector, VTAC applicant category, ATAR, enchancement studies

Primary Key for matching: Student ID and Course Code

English Language Pathway

Source: Callista Admission Records

Key Fields: English Test/Qual, Score

Primary Key for matching: Student ID, Course Code

Credit for Previous Studies

Source: Callista 'Advanced Standing' records

Key Fields: Amount of credit, Institution name, country of institution

Primary key for matching: Student ID, Course Code

Monash Enhancement Studies (uni studies undertaken as part of Year 12)

Source: Callista Enrolment Records

Key Fields: Unit title

Primary key for matching:

Student ID

Figure 1

Data sources used in the preparation of the Bachelor's Pass admissions dataset.

Converting administrative data into a form that is clean and consistent and ready for analysis can be a difficult process as, unlike survey data, analysis is rarely its primary purpose. As a result, a number of hurdles arose during the development of the ETL processes. Common issues included:

- **Duplicate administrative records** (e.g. when a student has more than one previous tertiary qualification which one should be attached to the file?)

    - There is no set rule on the best way to de-duplicate administrative records. The answer must always lie in the purpose for preparing the data.

- **Free text fields**

    - Data collected in free text fields are almost impossible to statistically analyse as there is little control over the way categories are named/spelled (e.g. Monash vs. Monash Uni, vs. Monash University). Where possible, preset codes have been stored on Callista™ and staff are instructed to use these. If preset codes are not available staff are instructed to record the data exactly as written on any official documentation.

- **Inconsistent or illogical data**

    - Sometimes data entry errors result in data that conflicts with other pieces of information or simply appears illogical. For example, students recorded as having undertaken their previous studies in 'Australian Antarctic Territory' rather than in Australia. University Statistics feed these errors back to the university's admission teams to improve the accuracy of the data entry and also build cleaning routines into the ETL processes to fix the more common mistakes.

Once all of the disparate pieces of information were merged together and the data cleaned, one final 'academic admission pathway' field was created using complementary pieces of information (e.g. by comparing the DEEWR 'basis for admission' field with previous qualification type data).This was required to allow for analysis that could compare the academic performance of students admitted into the university on the basis of different qualifications.

The pathways identified in this field are as follows:

Secondary Qual – VTAC	Single to Double Degree Transfer
Non-School Leaver – VTAC	Australian Tertiary Qual – Direct Entry
Monash Uni Foundation Year	Overseas Tertiary Qual – Direct Entry
Monash College Diploma – Part 1	Unknown Tertiary Qual – Direct Entry
Monash College Diploma – Part 2	Other Aust Foundation Year – Direct Entry
Sth Africa Foundation Program	Other Overseas Foundation Year – Direct Entry
Sth Africa Foundation Program & Non-award	Aust Secondary Qual – Direct Entry
Previous Monash Uni Course	Overseas Secondary Qual – Direct Entry
Diploma of Tertiary Studies	Unknown Secondary Qual – Direct Entry
	Other

Data Dissemination

University Statistics disseminate data to the wider university community through the use of Excel® pivot tables, which are chosen because of their accessibility, and because of the flexibility they provide to 'slice and dice' the data.

The Bachelor's Pass admission pivot table is published annually by University Statistics and contains an array of information, over a five-year time period, about the current and previous study of Monash's commencing Bachelor's Pass students (see Figure 2 for a screenshot of the table). The table also provides users with a count of course enrolments, average marks, retention rates and progress rates. As a result, all Monash University staff members now have access to data that allows them to look at the following sorts of issues:

- Academic performance by academic or English language admission pathway.
- Patterns in pathways used over time or at different campuses/faculties.
- Relationships between previous qualifications marks/scores and academic performance in first year.
- Extent to which credit is awarded.
- Patterns of previous tertiary study—how many students have studied at university before? Which university?
- Gap Years—how many students deferred their offer prior to commencing their degree?

The wide scale availability of these data has many benefits.

- The need to rely on statistical specialists to provide data for admissions-related decision-making is minimised.
- Monitoring of admission pathways and subsequent academic performance can be readily undertaken at the micro level (e.g. at the course level by course coordinators rather than just at the faculty/university level). It also occurs more often because it is relatively easy to do.

The data used by different areas of the university is consistent as staff no longer have to create their own ad hoc reports from Callista™ (a transactional 'moving' system) to obtain these data.
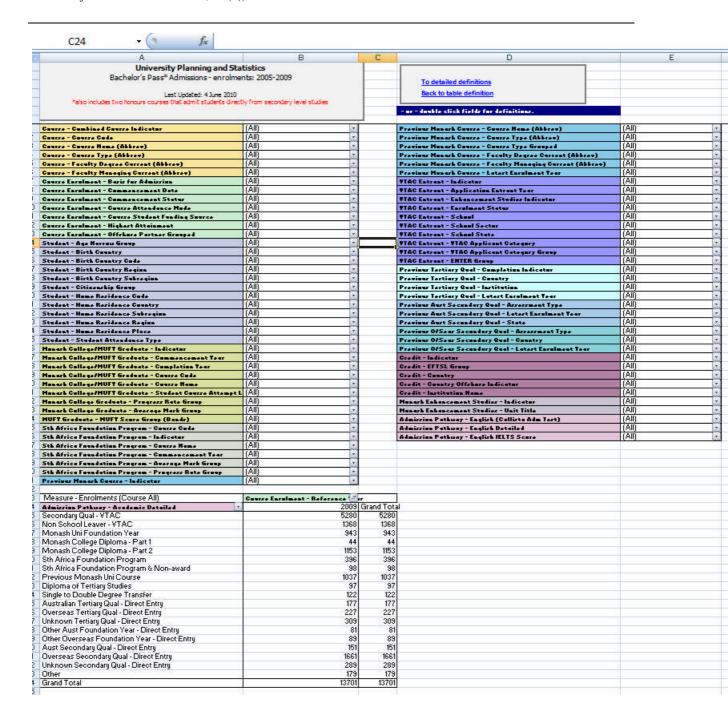
University Planning and Statistics
Bachelor's Pass* Admissions - enrolments: 2005-2009

Last Updated: 4 June 2010
*also includes two honours courses that admit students directly from secondary level studies

To detailed definitions
Back to table definition

- or - double click fields for definitions.

	(All)		Previous Monash Course - Course Name (Abbrev)	(All)
Course - Combined Course Indicator	(All)		Previous Monash Course - Course Type (Abbrev)	(All)
Course - Course Code	(All)		Previous Monash Course - Course Type Grouped	(All)
Course - Course Name (Abbrev)	(All)		Previous Monash Course - Faculty Degree Current (Abbrev)	(All)
Course - Course Type (Abbrev)	(All)		Previous Monash Course - Faculty Managing Current (Abbrev)	(All)
Course - Faculty Degree Current (Abbrev)	(All)		Previous Monash Course - Latest Enrolment Year	(All)
Course - Faculty Managing Current (Abbrev)	(All)		VTAC Entrant - Indicator	(All)
Course Enrolment - Basis for Admission	(All)		VTAC Entrant - Application Entrant Year	(All)
Course Enrolment - Commencement Date	(All)		VTAC Entrant - Enhancement Studies Indicator	(All)
Course Enrolment - Commencement Status	(All)		VTAC Entrant - Enrolment Status	(All)
Course Enrolment - Course Attendance Mode	(All)		VTAC Entrant - School	(All)
Course Enrolment - Course Student Funding Source	(All)		VTAC Entrant - School Sector	(All)
Course Enrolment - Highest Attainment	(All)		VTAC Entrant - School State	(All)
Course Enrolment - Offshore Partner Grouped	(All)		VTAC Entrant - VTAC Applicant Category	(All)
Student - Age Narrow Group	(All)		VTAC Entrant - VTAC Applicant Category Group	(All)
Student - Birth Country	(All)		VTAC Entrant - ENTER Group	(All)
Student - Birth Country Code	(All)		Previous Tertiary Qual - Completion Indicator	(All)
Student - Birth Country Region	(All)		Previous Tertiary Qual - Country	(All)
Student - Birth Country Subregion	(All)		Previous Tertiary Qual - Institution	(All)
Student - Citizenship Group	(All)		Previous Tertiary Qual - Latest Enrolment Year	(All)
Student - Home Residence Code	(All)		Previous Aust Secondary Qual - Assessment Type	(All)
Student - Home Residence Country	(All)		Previous Aust Secondary Qual - Latest Enrolment Year	(All)
Student - Home Residence Subregion	(All)		Previous Aust Secondary Qual - State	(All)
Student - Home Residence Region	(All)		Previous O/Seas Secondary Qual - Assessment Type	(All)
Student - Home Residence Place	(All)		Previous O/Seas Secondary Qual - Country	(All)
Student - Student Attendance Type	(All)		Previous O/Seas Secondary Qual - Latest Enrolment Year	(All)
Monash College/MUFT Graduate - Indicator	(All)		Credit - Indicator	(All)
Monash College/MUFT Graduate - Commencement Year	(All)		Credit - EFTSL Group	(All)
Monash College/MUFT Graduate - Completion Year	(All)		Credit - Country	(All)
Monash College/MUFT Graduate - Course Code	(All)		Credit - Country Offshore Indicator	(All)
Monash College/MUFT Graduate - Course Name	(All)		Credit - Institution Name	(All)
Monash College/MUFT Graduate - Student Course Attempt L	(All)		Monash Enhancement Studies - Indicator	(All)
Monash College Graduate - Progress Rate Group	(All)		Monash Enhancement Studies - Unit Title	(All)
Monash College Graduate - Average Mark Group	(All)		Admission Pathway - English (Collists Adm Test)	(All)
MUFT Graduate - MUFT Score Group (Bands)	(All)		Admission Pathway - English Detailed	(All)
Sth Africa Foundation Program - Course Code	(All)		Admission Pathway - English IELTS Score	(All)
Sth Africa Foundation Program - Indicator	(All)			
Sth Africa Foundation Program - Course Name	(All)			
Sth Africa Foundation Program - Commencement Year	(All)			
Sth Africa Foundation Program - Average Mark Group	(All)			
Sth Africa Foundation Program - Progress Rate Group	(All)			
Previous Monash Course - Indicator	(All)			

Measure - Enrolments (Course All)		
Admission Pathway - Academic Detailed	Course Enrolment - Reference Year	
	2009	Grand Total
Secondary Qual - VTAC	5280	5280
Non School Leaver - VTAC	1368	1368
Monash Uni Foundation Year	943	943
Monash College Diploma - Part 1	44	44
Monash College Diploma - Part 2	1153	1153
Sth Africa Foundation Program	396	396
Sth Africa Foundation Program & Non-award	98	98
Previous Monash Uni Course	1037	1037
Diploma of Tertiary Studies	97	97
Single to Double Degree Transfer	122	122
Australian Tertiary Qual - Direct Entry	177	177
Overseas Tertiary Qual - Direct Entry	227	227
Unknown Tertiary Qual - Direct Entry	309	309
Other Aust Foundation Year - Direct Entry	81	81
Other Overseas Foundation Year - Direct Entry	89	89
Aust Secondary Qual - Direct Entry	151	151
Overseas Secondary Qual - Direct Entry	1661	1661
Unknown Secondary Qual - Direct Entry	289	289
Other	179	179
Grand Total	13701	13701

Figure 2

Screenshot of Monash's Bachelor's Pass Admissions pivot table.

Analysing the Data to Inform Decision-Making

In addition to disseminating data, University Statistics also employs a Strategic Information Analysis team that undertakes statistical analysis and prepares reports of the findings to inform senior management decision-making. This work is generally more complex in nature than can be undertaken using one of the published pivot tables. The team's manager also sits on the university's Admissions Pathways Expert Advisory Group and the Coursework Admissions and Scholarships Committee (CASC) and therefore regularly draws on the Bachelor's Pass admissions data to undertake analysis that supports these groups. Below are two examples of the analysis that has been undertaken and an outline of how this

has informed decision-making and led to improvements in the university's admissions policies and practices.

Setting of entry requirements for international secondary qualifications

One of the core principles of Monash's undergraduate admissions policies is that secondary-level qualifications accepted for entry must be equivalent in standard to the Victorian Certificate of Education (VCE). As a result, before an international secondary qualification is approved for entry it must first be assessed against the VCE.

The approval process starts with the Admissions Pathways Expert Advisory Group ,which then reports to CASC. The group first undertakes a qualitative assessment of the qualification taking into account factors such as accreditation, curriculum covered, length of the course, entry requirements into the course and the marking system.

If the qualification is deemed equivalent in standard to the VCE, the group is required to make a judgment on how the scores from the qualification should be aligned against the ATAR score received by VCE students. This allows the university to set comparable entry standards for different secondary qualifications.

A reference table based on a banding system is used to set course entry requirements for students admitted on the basis of these qualifications. Each band is aligned to a particular ATAR range that is referred to when a band is assigned to a course. For instance, if the entry standard for a particular course is an ATAR between 70 and 74.95, the entry level is set at band 1. When a qualification is reviewed, its scores are then assigned across the bands with reference to the ATAR. In the example shown in Table 1, students admitted on the basis of 'Qualification X' would require a minimum score of 14 to gain entry to the course.

Table 1

Example of Monash's Undergraduate Entry Band Framework for International Secondary Qualifications

Band	ATAR	Minimum Qual X Score
0	65–69.95	12
1	70–74.95	14
2	75–79.95	16
3	80–84.95	18
4	85–89.95	20
5	90–94.95	22
6	95–97.45	23
7	97.5+	24

When a qualification is first assessed there are usually no quantitative data available to assign scores to each band, and so this judgment is made on the basis of the qualitative information available. However, after three years, each qualification is reviewed and the academic performance of students admitted on the basis of the qualification is examined. This allows for a statistical judgment of the qualification's suitability as an approved admission pathway.

This assessment is first provided in the form of a basic one-page report that can be prepared quickly. It gives a brief overview comparing the average marks and progress rates

of students admitted on the basis of the reviewed qualification against VCE pathway students. (See Figure 3 for an extract from the report prepared for the review of the GCE A Level.) If there is a significant and substantial difference in the academic performance of the two groups, it may suggest that the entry standards applied to this qualification need adjustment. In this case, and if enough data are available, regression analysis is used to calculate a score that is 'equivalent' to the ATAR.

This analysis was recently undertaken for the Ontario 12 qualification. The methodology uses linear regression to examine the relationship between the qualification scores and first-year average marks and then between the ATAR obtained by VCE pathways students and their first-year average marks. The linear equations resulting from this analysis are then used to calculate 'equivalences' between the qualification scores and ATARs. For example, if the analysis showed that Ontario 12 pathway students with a score of 70 obtained, on average, a first-year average mark of 60, then, by looking at the ATAR score that was related to an average mark of 60, it becomes possible to calculate the ATAR score to which an Ontario 12 score of 70 is 'equivalent'.

The analysis led to a change in the entry requirements applied to students admitted on the basis of the Ontario 12 qualification. As such, it is expected that there will be improved consistency in the academic performance of Ontario 12 pathway students with those admitted on the basis of the VCE.
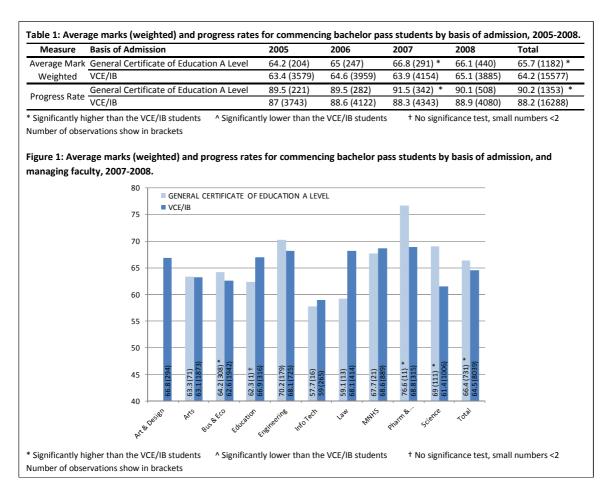
Table 1: Average marks (weighted) and progress rates for commencing bachelor pass students by basis of admission, 2005-2008.

Measure	Basis of Admission	2005	2006	2007	2008	Total
Average Mark Weighted	General Certificate of Education A Level	64.2 (204)	65 (247)	66.8 (291) *	66.1 (440)	65.7 (1182) *
	VCE/IB	63.4 (3579)	64.6 (3959)	63.9 (4154)	65.1 (3885)	64.2 (15577)
Progress Rate	General Certificate of Education A Level	89.5 (221)	89.5 (282)	91.5 (342) *	90.1 (508)	90.2 (1353) *
	VCE/IB	87 (3743)	88.6 (4122)	88.3 (4343)	88.9 (4080)	88.2 (16288)

* Significantly higher than the VCE/IB students   ^ Significantly lower than the VCE/IB students   † No significance test, small numbers <2

Number of observations show in brackets

Figure 1: Average marks (weighted) and progress rates for commencing bachelor pass students by basis of admission, and managing faculty, 2007-2008.

* Significantly higher than the VCE/IB students   ^ Significantly lower than the VCE/IB students   † No significance test, small numbers <2

Number of observations show in brackets

Figure 3

Extract from international Year 12 qualification review reports (GCE A Level).

VCE English and subsequent academic performance

Strong literacy and communication skills, both written and verbal, are an important prerequisite for students wishing to study at an Australian university. Without a strong foundation in English, the ability for students to learn and demonstrate their learning can be compromised. With the growth in international student numbers, the assessment of English language skills in admission processes has long been the focus of much debate. For instance, there has been criticism that, in 2005–06, about a third of successful permanent residence applicants who are former students in the Australian tertiary sector were not able to achieve an IELTS score of 6 (the band classified as 'competent') (Birrell, 2006), raising questions about the English admission standards within universities. Additionally, the Victorian Auditor General's 2002 report *International Students in Victorian Universities*, which was based on an audit of three universities including Monash, noted that 'a significant proportion of university staff have concerns regarding the English language proficiency of international students' (2002, p. 4) and noted that this may be due to selection processes that allowed some students to bypass tests of English language by entering through a different pathway. An earlier review of university English entry requirements by Coley (1999) supported this conclusion, finding that there were at least 61 'English language pathways' accepted across the Australian sector ranging from 'stringent' tests such as the IELTS, to measures that arguably have little validity in terms of the English required for university studies such as 'membership of a professional body'. Coley also concluded that English admission policies in the sector are 'based on secondary information and administrators are generally not familiar with the actual tests themselves' (2009, p. 9).

Given this, University Statistics have prepared a number of reports examining relationships between the pathway used by students to satisfy the university's English language requirements and their subsequent academic performance.

One piece of work in particular has driven change both internally and externally. Analysis undertaken by University Statistics in 2005 comparing the academic performance of domestic students with their international counterparts highlighted that international students who had completed the VCE were performing at a much lower level than other students, both domestic and international. This seemed surprising given they had already been studying in the Australian education system and might arguably be better prepared for university studies in Australia than other international students recruited from offshore.

Further investigation showed that the vast majority of these students had satisfied the English requirements of the VCE by completing a subject called English as a Second Language (English ESL), rather than the other English subjects undertaken by native English speakers. At the time, the minimum English score required by VCE pathway students into the university was a 25 in English (or 30 for some courses) and this applied to both the standard VCE English and the English ESL subject. Analysis was then undertaken to compare the average marks achieved by students who had studied English ESL with those who had studied the standard VCE English subject. The work found the average marks of English ESL students were much lower and that only those who achieved a study score of about 40 or more (out of a maximum of 50) were performing on the same level as those who had studied the standard VCE English subject.

Given the importance of these findings for the Victorian education sector, the findings were also communicated to VTAC who responded by convening a working party to further examine the issue. Using regression analysis to examine relationships between English and

English ESL scores and results achieved by VCE students on the written communication component of the General Achievement Test, it was found that, to be equivalent to a standard English score, an English ESL score had to be between five and seven points higher (VTAC, 2007).

This work led to a change in the university's English language policy and so students who have studied English ESL in their VCE are now required to have a minimum score of 30 (compared to 25 for the standard English). Other universities such as the University of Melbourne, Deakin and Latrobe also followed suit (*The Australian*, 2007). The new requirements have been in place for two years now. While some preliminary work has been undertaken to evaluate the impact of this change on levels of academic performance, it is too early to make solid conclusions as only one-year's worth of results are available at this time. A detailed assessment will be undertaken in 2011.

Conclusion

Access to comprehensive and accurate data and insightful analysis is an important prerequisite for effective decision-making in any organisation—universities are not exempt from this. The recent emphasis on widening participation and the changing funding arrangements resulting from the Bradley Review means that it is more important than ever that institutions can respond quickly to change through evidence-based decision-making. Additionally, cycle 2 AUQA audits will require institutions to closely monitor and review their academic standards—work that can only be undertaken if the institution's student data quality is of a high standard.

At Monash, it became apparent that one of the major gaps in the university's suite of data lay in the lack of detailed admissions data. Decisions about appropriate entry requirements for the university's courses had to be made without sufficient quantitative data, or were being delayed waiting for data to be collected and prepared on an ad hoc basis.

In response to this, University Statistics embarked on a long journey of data collection, preparation and analysis to fill this gap. Approximately four years on from the commencement of this work, Monash has a substantially greater understanding of the educational background of its student body and how this relates to performance within its degrees. Senior management are much better placed to make decisions about changes to its admission policies and recruitment practices and can better judge what the impact of these decisions might be. Requests for analysis that might have taken months to complete in the past, can now often be completed in a matter of days.

While the availability and accuracy of admissions data has improved immensely, the work is ongoing and has also been picked up by other areas of the university. In early 2010, the Admissions Unit, the Student Systems team and the university's Business Intelligence team worked together to incorporate extra 'basis for admission' codes into Callista™. This means that if a student enters through a key pathway such as the Diploma of Tertiary Studies (DOTS), the selection officers can select 'DOTS' as the basis for admission, rather than simply using a generic 'complete or incomplete higher education course' code. This will streamline the processes used to categorise students into admission pathways and will also improve data accuracy. Additionally, plans are underway to improve access to Year 12 subject data so that analysis can be undertaken to examine the relationship between individual Year 12 subjects and university performance. This work will assist the university in assessing the role of prerequisite subjects in entry requirements.

The constantly changing and evolving nature of higher education in Australia will challenge university statistics units to be increasingly proactive in meeting the data needs of senior management. It will be necessary to expand the scope of available data and to ensure that it is flexible enough to respond to shifting requirements. While there are common themes and issues facing all universities across the sector, each institution will have its own specific requirements for information and analysis and will dedicate varying levels of resources to this task. However, it is hoped that this article, and its description of the process of developing and utilising admissions data to inform decision-making, will provide other institutional researchers with ideas on how they can effectively respond to these challenges.

References

Australian Universities Quality Agency. (2010). *Audit Manual Version 7.1.* Retrieved 27 September, 2010, from http://www.auqa.edu.au/files/auditmanuals/ audit_manual_version_7.1_webversion.pdf

Birrell, B, (2006), Implications of low English standards among overseas students at Australian universities. *People and Place, 14*(4). 53–63.

Birch, E.R., & Miller, P.W. (2007). Tertiary entrance scores: Can we do better? *Education Research and Perspectives, 34*(2), 1–23.

Birrell, B., Rapson, V., Dobson, I., Edwards, D., & Smith, T.F. (2002). *From place to place: School, location and access to university education in Victoria.* Clayton, Australia: Centre for Population and Urban Research, Monash University.

Coley, M. (1999). The English language entry requirements of Australian universities for students of non-English speaking background. *Higher Education Research & Development, 18*(1), 7–17.

Department of Education, Employment and Workplace Relations. (2009). *Transforming Australia's higher education system.* Retrieved 28 September, 2010, from http://www.deewr.gov.au/HigherEducation/Documents/PDF/Additional%20Report% 20-%20Transforming%20Aus%20Higher%20ED_webaw.pdf

Dobson, I., and Skuja, E. (2002). Secondary schooling: Tertiary entry ranks and university performance. *People and Place, 13*(1), 53-62.

Gillard, J. The Hon. (2009, December 9). *Opening address: Transition, retention and progression forum.* Retrieved 27 September, 2010, from http://www.deewr.gov.au/Ministers/Gillard/Media/Speeches/Pages/Article_091209_1 35332.aspx

Green, R., Brown, E., & Ward, A (2009) Secondary school science predictors of academic performance in university bioscience subjects. *Anatomical Sciences Education, 2*(May/June), 113–118.

James, R., Andrerson, M., Bexley, E., Devlin, M., Garnet, R., Marginson, S., & Maxwell, L. (2008). *Participation and equity: A review of the participation in higher education of people from low socio-economic backgrounds and Indigenous people.* Canberra, Australia: Universities Australia.

James, R., Bexley, E., & Shearer, M. (2009). *Improving selection for tertiary education places in Victoria.* Parkville, Australia: Centre for the Study of Higher Education, the University of Melbourne. Retrieved 27 September, 2010, from http://www.cshe.unimelb.edu.au/people/staff_pages/James/Improving_Tertiary_Selection_in_Victoria.pdf

Levy, S., & Murray, J. (2005). Tertiary entrance scores need not determine academic success: An analysis of student performance in an equity and access program. *Journal of Higher Education Policy and Management, 27*(1), 129–140.

McDonald, A.S., Newton, P.E., & Whetton, C. (2001). *A pilot of aptitude testing for university entrance.* London: The Sutton Trust.

Ministerial Council on Education, Employment, Training and Youth Affairs. (2007). *Guidelines for establishing Australian universities (relating to National Protocols A and D).* Retrieved 27 September, 2010, from http://www.mceecdya.edu.au/verve/_resources/NationalGuidelinesOct2007_AandD.pdf

Murphy, M., Papanicolau, K., & McDowell, R. (2001). Entrance score and performance: A three year study. *Journal of Institutional Research, 10*(2), 32–49.

Naylor, R., & Smith, J. (2002). *Schooling effects on subsequent university performance: Evidence for the UK university population.* (Warwick Economic Research Papers, No. 657). Retrieved 7 October, 2009, from http://www2.warwick.ac.uk/fac/soc/economics/research/workingpapers/publications/twerp657.pdf

Rout, M. (2007, December 19). Universities get tough on ESL. *The Australian* (online). Retrieved September 27, 2010, from http://www.theaustralian.com.au/higher-education/business-education/universities-get-tough-on-esl/story-e6frgcp6–1111115146260

Victorian Tertiary Admissions Centre. (2007). Memo to Victorian school principals (Senior Secondary) (unpublished).