Tracking student success: Using an action learning approach to better understand the how, what, where and why

JOSEPHINE PALERMO, DAVID MARR AND JENNIFER ORIEL
Deakin University, Australia

JULIE ARTHUR AND DON JOHNSTON
Southern Cross University, Australia

Submitted to the *Journal of Institutional Research,* 28 June, 2012, accepted for publication 10 July, 2012.

Abstract

Australian higher education lags behind other western countries in relation to access and attainment of equity groups (Organisation for Economic Development [OECD], 2010). This is despite major policy reforms in the last two decades targeting better educational outcomes for students from disadvantaged backgrounds. The Australian Labor Government's Higher Education Participation and Partnerships Program (HEPPP) creates a new demand for evaluation methods that can establish whether interventions funded under the HEPPP contribute to the Commonwealth's policy goal of increasing the participation of low socioeconomic status students in university to 20% by 2020 (Oriel, 2011a).

In 2011, AAIR received funding from the Australian Learning and Teaching Council (ALTC) to conduct a study to track student success. AAIR is undertaking the study in conjunction with Deakin University and Southern Cross University. Both universities have HEPPP funds available to undertake student cohort tracking programs. The initial phase of the ALTC study is focusing on how each of the participating universities approach their cohort tracking projects, the systems they are developing for capturing the essential data, and the lessons learnt as they progress their projects. The study is also considering comparative case studies both in Australia and internationally especially as they concern disadvantaged students.

To better understand how to track these student cohorts, what attributes we need to focus on, over what period do we need to track them and why we are tracking them, this study has adopted an action learning methodology. Action Learning Teams (ALTs) have been established at Deakin University and at Southern Cross University.

During this study, the project team will be monitoring its own learning pathways, activities and outcomes. Lessons learnt will contribute to the knowledge other institutions can take into their own cohort tracking projects. This article discusses the questions posed and challenges raised in the initial phases of conducting cohort tracking at each university.

Keywords: participation and access, equity groups, cohort tracking, student progress

Correspondence to: Dr Josephine Palermo, Organisational and Industrial Psychology, Faculty of Health, Deakin University, Burwood Campus, Australia. Email: josephine.palermo@deakin.edu.au

Background and rationale

Inequalities in educational attainment remain despite the advancements of policy frameworks such as *A Fair Chance for All* in the 1990s and, more recently, the *Review of Higher Education*. This is especially true for people of low socioeconomic status (SES), people with disabilities and women—especially in non-traditional fields of study and higher degrees, rural and remote backgrounds and Indigenous people (James, 2005; James, Bexley, & Maxwell, 2008). Inequities in access, participation, success, retention and completion still occur for those programs with the greatest demand, and first-year attrition is a significant issue, especially for Indigenous and remote students.

The Bradley Review (Department of Education and Workplace Relations, 2008) linked expansion of the higher education sector to achieving equity targets, a policy move that is mirrored in widening participation policies in other countries (such as the UK). Bradley suggested that as well as income support, the criteria required for expansion were new institutions, expansion of the academic workforce, institutional mission differentiation, better access via open entry, curriculum innovation for accessibility and relevance, and strategies for improving retention in the first year (James, 2009).

University structures and policies, however, are geared towards perpetuating a social order that is mirrored in the K12 sector. It is therefore not surprising that James (2005) suggests that it is difficult to understand the precise contribution that equity policies and programs have had on targets achieved to date. Isolated and remote students and Indigenous students are still participating at a rate that is less than half their incidence in the broader population (Martin, 2005). If you exclude Indigenous and remote students, retention rates of equity groups are on par with other students generally. Even so, attrition rates in many universities are much higher than could be considered acceptable. This does not instil confidence that the sector can deliver successful outcomes to students who are from the most disadvantaged groups in Australian society. In fact, the opposite may be true.

Part of the problem is that narratives around ‘student choices’ and ‘diversity’ have been poorly aligned with equity policy (James, 2005). There has been a narrow equating of socioeconomic disadvantage with financial hardship and a focus by educators on concepts of external barriers to access and success. Instead, researchers such as Ramsay (1999), James (2005) and Marginson (2009) have suggested that universities should focus on the causes of disadvantage (e.g., those which reside in families, communities and schools) and should also focus on boosting the ‘encouraging factors’ that enable access and attainment for equity groups in higher education.

This article describes the first phase of a longitudinal study to monitor outcomes related to student cohorts more effectively at the institutional level in order to gain a better understanding of the root causes of disadvantage, as well as tracking the enablers of access, retention and success for students from diverse backgrounds. Tracking students in their day-to-day activities is an empirical means by which we can identify those factors that hinder progress. In this project we will use a tracking system that follows a cohort of students who come from diverse backgrounds in order to identify those factors in their life that impede or ‘boost’ academic excellence. A process for monitoring and reporting on the educational progress of cohorts of students (cohort tracking system) would enable a large-scale impact assessment of current learning and teaching activities employed to improve underprepared students’ success and completion in higher education, such as inclusive pedagogy, bridging courses, mentoring and scholarships. Student cohort tracking enables the scientific evaluation of university participation activities under the Higher Education Participation and

Partnerships Program and complements evaluations of university–school partnerships being designed in Victoria under the Commonwealth guidelines by monitoring students across the educational life-cycle from point of contact in school to degree completion.

The higher education sector as a whole has grappled with the development of student cohort systems that bring together people, processes and technologies. Universities are rich in data. However, data warehousing and business intelligence systems are often naïve and unsophisticated. This results in limited access to the range of institutional data required to identify and track student cohorts and reduces the capacity to analyse such data and apply predictive analytics to 'at risk' target groups.

Approach

The study involves conducting comparative case studies across two universities on the people (including partnerships), processes and technologies required to track student cohorts. Partner sites include Deakin University with campuses in Victoria and Southern Cross University (SCU) based in northern New South Wales.

This study will deploy an action learning methodology (Patton, 1997) with teams within two institutions who will design and implement student cohort tracking (over 5 years) as they learn from international and shared practice, and document their own learning. Action learning is defined as a strategy by which people learn with and from each other as they attempt to identify and then implement solutions to their problems or developmental issues. This is achieved through evaluation cycles that involve planning; action, observation and then reflection (see Figure 1). 'Action research takes its cues—its questions, puzzles and problems—from the perceptions of practitioners within particular, local practice contexts.' (Argyris & Schon, 1991 cited in Dickens & Watkins, 2006, p. 187). There are three essential features that must be present for an activity to be legitimately an action learning program. These are:

- There must be action in the real world rather than in some simulation;
- The activity must be conducted in a way which involves others, especially other participants who are working on the same or quite different projects; and
- The emphasis must be upon learning; not just the taking of action and this is what distinguishes action learning from project team membership. (Patton, 1997)

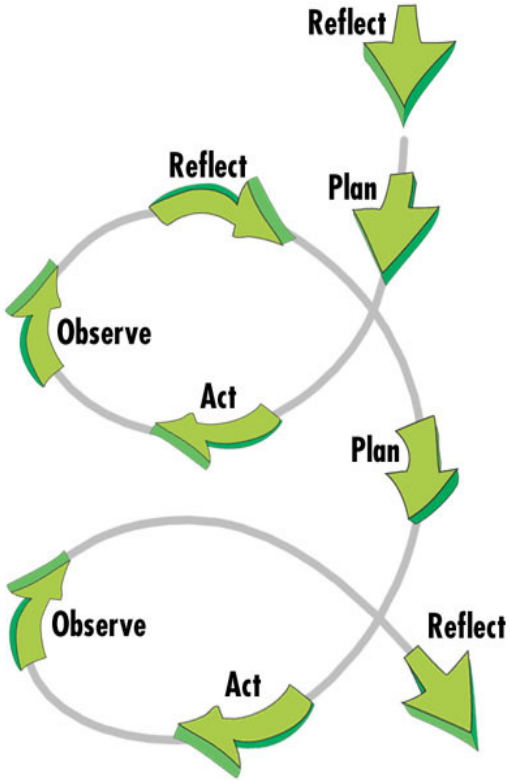

Figure 1. Kurt Lewin's Spiral Model, Action Research Cycle.

This study aims to measure the impact of teaching and learning activities to improve the participation, progress and completion of students from low SES, low income and academically underprepared backgrounds.

Action learning teams: Process

The first stage of the study involves designing the appropriate elements necessary to advance the tracking of student cohorts. ALTs are:

- Considering criteria that enable and/or inhibit the sustainability of student tracking over time
- Learning through international and shared practice
- Learning through research.

These learning processes are inter-dependent and occur at various stages of the study, not necessarily in a linear sequence.

Considering criteria for sustainability of student tracking over time

ALTs are collecting data about their own learning process as they embark on the design of their student cohort systems. This involves considering the following conditions required to enable the sustainability of student tracking over time (note that ALTs are also considering other questions and criteria during the conduct of the study):

People:

- Who needs to be involved?

- What governance is required?
- Which stakeholders need to be included and how?
- Do we need partnerships? Which ones?
- How do all these people need to behave towards one another?
- Which relationships are in place now? Which need to be established?

Processes:
- What processes are involved?
- What information do teaching staff require that relate to cohort characteristics? What do they already get?
- Are there processes in place to intervene with students 'at risk' related to cohort characteristics?
- What teaching and learning interventions are currently in place?
- Should any of the current processes be changed? Should new processes be established?

Technologies:
- Are current student administration systems enabling of student cohort tracking and if not, where are modifications required?
- Are current data warehousing systems enabling of student cohort tracking and reporting and if not, where are modifications required?
- Does one technology allow both the storage and reporting of cohort data?
- Are there new/emerging technologies that can assist in the tracking of student cohorts?
- Collaborative technologies; what are they? Are they needed to track student cohorts?

Learning through international and shared practice

ALTs are facilitated by the Project Leader and Research Fellow in the documentation of their learning process. The Project Team are providing ALTs with expert advice through a literature review on the features of effective student cohort tracking systems internationally.

Teams from each institution are planning to share their learning with the other institution, including discussing the criteria that enable or inhibit the design of effective student cohort tracking.

Learning through research

ALTs are collecting a number of baseline measures, such as perceptions of teaching staff and an audit of current processes. They are participating in key informant interviews to enable the documentation of the learning process at the end of the first stage of the project. In total, around 30 key informant interviews will be conducted early in 2012 comprising ALT members, stakeholders related to partnerships with schools, and any process leaders that are identified through the audit of current processes. This data will form baseline measures so any changes over time in staff perceptions and practices as a consequence of conducting this research can be monitored.

The Project Team is also monitoring what it is learning from its own observations of the two ALTs, its processes for observing them, how it has structured its methodology and how the team adapts to the things it learns from its observations. As Deakin and SCU's approaches differ, the Project Team needs to be mindful of these differences and to respond accordingly. This inevitably adds another level of complexity to the process and additional

burden on the support the research team can provide. In many ways, the addition of the ALTC Project on top of the already high demands imposed by the HEPPP projects is in itself a further imposition both institutions could probably do without. Managing these conflicting demands is something that the Project Team needs to carefully monitor so as to not unduly distract the participating institutions from their main game, the HEPPP projects. So it will be very important for the Project Team to develop ways that allow the HEPPP projects to progress while still being able to monitor that progress in a non-invasive manner.

Case Studies: Progress to date

SCU's position within Australia's higher education system, as a relatively small and new university (established in 1994), needs to be considered in context. SCU has a diverse student population with school leavers representing less than 20% of commencing students. Around 60% of students are from a regional background, with 24% from a low SES background. Around one third study externally and almost 40% of students study part-time. SCU has been chosen because it currently exceeds the sector average for the participation rates of students from low SES, regional, rural, remote and Aboriginal and Torres Strait Islander backgrounds.

Deakin University provides a good comparison to SCU. It has been working with the University Executive to introduce a student cohort tracking system since June 2010. The university has a diverse student body with regional and low SES participation proportions above the Victorian higher education average. One quarter of its students are admitted through the Special Entry Access Scheme, for people from disadvantaged backgrounds.

As mentioned previously, this study is using an action research methodology within each university. Action Learning Teams (ALTs) are being led by Dr Jennifer Oriel, Manager, Student Access and Equity at Deakin University, and Ms Julie Arthur, Director Planning Quality and Review at Southern Cross University. ALTs comprise staff members from various backgrounds to ensure that all technical aspects of the project are considered. This includes teaching and learning academic expertise as well as data warehousing and analysis expertise.

At Southern Cross University the Action Learning Team comprises the Director, Planning, Quality and Review (Chair), Director Equity, Head, Equity and Diversity, the Institutional Research Officer, MIS Corporate Systems Developer and Academic Directors of T&L.

SCU has established an *i-Ontrack* Project being overseen by the i-Ontrack Project Reference Group chaired by the Deputy Vice-Chancellor. SCU's i-Ontrack project has a number of key objectives:

1. Measure the impact of teaching and learning activities to improve the participation, progress and completion of students from low SES, low income and academically underprepared backgrounds;
2. Monitor outcomes related to student cohorts effectively at the institutional level in order to gain a better understanding of the root causes of disadvantage as well as tracking the enablers of access, retention and success of students from diverse backgrounds;

3. Develop a tracking system that follows a cohort of students who come from diverse backgrounds in order to identify those factors in their life that impede or boost academic excellence;
4. Identify the most effective ways of extending the foundation of technologies and data sets available at SCU to build a platform for identifying, planning and monitoring of 'at risk' students; and
5. Enable the delivery of a retention and success planning capability which can:
    - Identify students 'at risk';
    - Plan key retention metrics and show performance against plans
    - Plan intervention methods to be used for an identified set of 'at risk' students
    - Identify data capabilities for an early warning system
    - Identify best point of intervention
    - Support an intervention model.

With respect to point 5 above, SCU is partnering with a consultant in order to develop a predictive model for students most at risk. In order to systematically address these conditions, SCU is also redefining, or at least reconsidering, much of the terminology it uses in this regard. Terms such as attrition and at risk are being carefully reconsidered and the exclusion policy is in the process of being rewritten to more adequately account for at risk students. It has also been proposed that these changes to terminology and policy should apply to both domestic and international students.

Deakin's Diverse Student Cohort Tracking Committee (DSCTC) was established in July 2010 to prepare university data systems for new regulatory requirements arising from the Commonwealth's policy paper 'Transforming Australia's Higher Education System'. In particular, the government's focus on student participation indicators in the Higher Education Participation and Partnerships Program (HEPPP), and teaching and learning performance standards in the draft 'Indicator Framework for Higher Education Performance Funding', demonstrated the need for evidence-based policymaking at the local and national levels.

Deakin's success in attracting funding for a number of HEPPP projects provides a significant impetus for the introduction of cohort tracking under the program's auspices and funding.

In a briefing paper to the Committee, its founding Chair, Dr Jennifer Oriel established that its primary function was to:

> develop systems to track students from low SES backgrounds in the first instance, and to use this process to diagnose and address gaps in the existing student data systems towards consideration of a more mainstream cohort tracking model that could inform business intelligence capabilities. (Oriel, 2011c, p. 1)

Oriel identified four basic requirements for the introduction of student cohort tracking and noted that significant progress had been made towards the introduction of low SES student cohort tracking at the university, including (1) the purchase of the geo-coding software to match student addresses to collection districts, which replaces the postcode reference value previously used by DEEWR; (2) funding has been provided by Student Access and Equity for the employment of a HEPPP project officer and (3) discussions have occurred surrounding the interoperability between the data warehouse and the Student Information System to (4) allow the generating of reports related to student cohort tracking.

In the briefing paper, Oriel also identified that the following attributes were defined for data capture to enable cohort tracking of low SES students against the principles, objectives and indicators of the HEPPP, and the proposed Indicator Framework for Higher Education Performance Funding:

- SES by Collection District—low, medium and high
- school of origin
- Australian Tertiary Admissions Rank (ATAR)
- Commonwealth Scholarship or Deakin equity scholarship recipient
- 'first in family' to higher education
- Special Entry Assessment Scheme (SEAS) applicant
- Grade Point Average (GPA)/ Weighted Average Mark (WAM)
- attrition—more clearly defined as discontinuation rather than as course change
- Bachelor degree completion rate
- use of student support services

While the identification of variables for predicting at risk students is important, universities tend to grapple with the interpretation of macro-level cohort data at the individual level. In a separate paper to the Vice-Chancellor in June 2011 on national indicators for low socioeconomic status, Dr Oriel advised that 'while it is not necessary to introduce causative analysis for all impact assessments, it is important to improve individual level reporting in response to the HEPPP' (Oriel, 2011b, p. 4). She noted that, 'Further impetus for the introduction of individual measures to assess project outcomes was provided in the NCVER report 'Measuring the Socioeconomic Status of Australian Youth', and that 'while the SEIFA index provides a reasonably accurate measure of SES higher education participation at the aggregate level, it is a poor reference measure for individual student performance (Oriel, 2011b, p. 4).'

In a review of Lim and Gemici's paper, Oriel explained that:

> A new composite SES measure based on a factor analysis model used in the Australian Council for Education Research Longitudinal Studies of Australian Youth (LSAY) included 14 different variables. The use of composite measures for socio-economic status derives from literature on the taxonomy of educational disadvantage which organises classifications according to multiple variables (Singleton, 2010). However, there are potential problems for evaluation of university programs against national policy objectives if different measures are employed to assess outcomes. In addition, there is evidence to suggest that when assessing equity performance, different variables affect performance against each indicator. For example, a 2010 analysis on attrition in Australian universities by Gavin Moddie found that the three main factors affecting student attrition were tertiary entrance scores, mode of study and off-campus or on-campus attendance. (Oriel, 2011c, p. 2)

Oriel concluded that

> Some Australian universities are beginning to respond to the complexity of improving academic outcomes for students from diverse backgrounds by designing their own composite measures based on institutional student profiles. Such developments indicate

> that a broader SES measure may be needed, particularly to assess the impact of teaching and learning programs on students' progress in response to the HEPPP. (Oriel, 2011c, p, 2)

Deakin has strong partnerships with 40 schools across Victoria as a part of the Deakin Engagement and Access Program, which Dr Oriel (who is also the Manager of Student Access and Equity), established in 2007. In 2011, Dr Oriel designed a new program, *Access Express*, with seven schools for the purpose of positioning the university favourably to win the first round of Commonwealth competitive funding under the HEPPP. Among 35 bids submitted from universities across Australia, *Access Express* was one of eleven selected by the Minister for funding. It introduces impact evaluation methodologies for university–school partnerships that are enabled by cohort tracking.

SCU's approach has drawn on international research, particularly in the area of academic or learning analytics. The *i-Ontrack* Committee have mostly focused on what data are currently available through SCU's information systems that can be analysed to provide a picture of a students' interaction with the university as a pseudo measure of their level of engagement with the university.

A number of commentators (Fritz, 2011; Zhang Almeroth, Knight, Bulger, & Mayer, 2010) discuss the relationship between the use of activity data of the university's Course Management System (such as Blackboard®, Web CT™ or Moodle™) and student success. In both cases, the intention was to provide students an early indication of their own usage of these systems compared with the usage of the broader university population as they believed that showing students their relative level of engagement with the CMS prompted a motivational response. One such response may be to seek academic assistance at an earlier point of time in their studies (Fritz, 2011).

SCU is therefore interested in obtaining as much data as possible from their CMS and from their other information systems. One other data source SCU has identified is the students' usage of their libraries' resource collections. Unsurprisingly, many of these systems do not provide, as a general rule, analytics of the kind necessary to monitor student activity—at least in a form that can be easily integrated with a monitoring system. Therefore, one of SCU's early considerations will be to understand what analytics can be obtained currently and what could be obtained if additional resources were applied to the task.

To assist the development of a predictive model for identifying students at risk, SCU have engaged the services of an external consultant with experience in the area of predictive modelling. The consultant is using the various data sources available as inputs into the model they are developing.

SCU's intention would be to develop intervention strategies appropriate and focused on those students who exhibit at risk tendencies, identified using the predictive modelling, early in the students' tertiary studies.

By contrast, Deakin University are focusing their data collection on those student characteristics that pertain mostly to their pre-tertiary circumstance (e.g., tertiary entrance scores, 'first in family' and socioeconomic status) in conjunction with study mode and academic performance in their tertiary studies. In this way Deakin are engaging with their participating schools in order to derive a fuller picture of the student's pre-tertiary circumstances. They believe they may be able to focus their interventions on potential students while they are still within their pre-tertiary environments, namely schools.

Of course, the challenges here are quite different: SCU is trying to collect data from its own information systems over which it has complete control (although limited by the technology); Deakin is trying to understand the pre-tertiary environment, but having less control over being able to influence school policy and so forth.

Teams at each institution are 'learning by doing' as they document their learning process, which, in the first stage of this project, will be the design of an effective student cohort tracking system. The two teams are collecting data about their own learning process and are also conducting research to inform their practice along the way.

Conclusion

The project has chosen two institutions to participate in an action research process that have adopted quite different approaches to the implementation of their HEPPP projects. On the one hand, Deakin University has a large number of HEEP projects it is managing through project teams coordinated through a centralised committee, the Diverse Student Cohort Tracking Committee. These teams are themselves determining what data needs to be collected, the best way to collect the cohort data and how best to evaluate the effectiveness of any interventions they are monitoring.

Deakin is concerned with a number of HEPPP projects, mostly dealing with data pertaining to their students' pre-tertiary attributes such as tertiary entrance score, 'first in family' and socioeconomic status. The university has partnered with a number of secondary colleges in their catchment in order to assist them in these projects.

SCU, on the other hand, is focused on one HEPPP project dealing with the development of a predictive model that will be able to identify particular cohorts of students who may be at risk and the type of risks to which they may be susceptible. An external consultant is assisting them with the development of such a predictive model. The data they are collecting relates to student attributes during the early stage of the university study, such as LMS and library usage.

Both universities are considering the data that are needed, how that data are to be recorded and stored, and what reporting capabilities will be needed to interrogate that data. They are also interested in who should be involved in determining these matters and how to monitor the contributions the various individuals make. What processes they choose to use to manage their programs is also something that each institution is very keen to develop and understand.

This longitudinal study will hopefully provide some insights into the various ways in which student cohort tracking projects can develop, the good practices that can be learnt, as well as those hard lessons that should possibly be avoided. By investigating methodologies that more effectively track student cohorts, this study will provide longitudinal and empirical evidence for the effect of current strategies to address educational disadvantage and recommendations for how to more effectively track performance into the future. Results from this study will also enable a better understanding of where teaching and learning interventions could be best placed to assist underprepared students' success and completion in higher education. It will identify which life course conditions (such as high levels of student mobility) may need to be tracked so that students at risk can more easily be identified early and assisted to achieve successful outcomes.

At this early stage of the research, it is clear that implementing a further level of monitoring to the programs adds another level of complexity that each institution could possibly do without. However, the later benefits of understanding what provides for a successful cohort tracking system will undoubtedly benefit both institutions involved, as well as providing other institutions who wish to undertake such programs with much clearer implementation guidelines than may presently be the case.

References

Department of Education and Workplace Relations. (2008). *Bradley Review. Review of Australian Higher Education: Final Report*. Canberra: Author. Retrieved from http://www.deewr.gov.au/he_review_finalreport

Dickens, L., & Watkins, K. (2006). Action research: Rethinking Lewin. In J. V. Gallos (Ed.), *Organizational development* (p. 187). San Francisco: John Wiley.

Fritz, J. (2011). Classroom walls that talk: Using online course activity data of successful students to raise awareness of underperforming students. *Internet and Higher Education, 14*, 89–97.

James, R. (2009). Implications of the Bradley Review's recommendations for student equity groups. *Proceedings of the National Higher Ed Student Equity Forum,* February 25–26 (p. 14), South Australia.

James, R., Bexley, E., & Maxwell, L. (2008). *Participation and equity*. Canberra: Universities Australia.

James, R. (2005). University values and equity: Reconsidering equity policies and strategies. *Proceedings of the National Higher Education Student Equity Forum,* May 25–27, Canberra. Retrieved from http://www.deewr.gov.au/HigherEducation/Publications/Documents/UniversityValuesandEquity.pdf

Marginson, S. (2009). The potential for a forward move on equity in Australian higher education: What does the international picture tell us? *Proceedings of the National Higher Ed Student Equity Forum,* February 25–26 (p. 11), South Australia.

Martin, L. (2005). Analysing equity data. *Proceedings of the National Higher Education Student Equity Forum*, May 25–27, Canberra.

Organisation for Economic Development. (2010). *OECD Stats Extracts*. Retrieved from http://stats.oecd.org/Index.aspx?DatasetCode=CSP2010.

Oriel, J. (2011a). Enlightening evaluation: From perception to proof in higher education social policy. *Australian Universities Review, 53*(2), 59–67.

Oriel, J. (2011b, July 14). *Diverse Student Cohort Tracking Committee: Discussion Paper*. Burwood, Australia: Deakin University.

Oriel, J. (2011c, 28 June). *Measuring the socioeconomic status of Australian youth: Summary Report.* Burwood, Australia*:* Deakin University.

Patton, M.Q. (1997). *Utilization-focused evaluation: The new century text*, 3rd edn. Thousand Oaks, CA: Sage.

Ramsay, E. (1999). The National Framework for Australian Higher Education Equity: Its origins, evolution and current status. *Higher Education Quarterly, 53*(2), 173–189.

Singleton, A.D. (2010). *Educational opportunity: The geography of access to higher education*. Farnham, England: Ashgate.

Zhang, H., Almeroth, K., Knight, A., Bulger, M., & Mayer, R. (2010). Moodog: Tracking students' online learning activities. *Journal of Interactive Learning Research, 21*(3), 407–429.