Measuring student success and student risk: the use of administrative data to evaluate the longitudinal outcomes of potentially at-risk student groups

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Abstract

Universities would like to evaluate programs for students on the basis of their effect on the 'bottom line', that is student retention, progression and completion. However, these measures are influenced by so many factors that individual program effects can be difficult to isolate. Administrative data can, however, be used to establish baselines for whole cohorts and for particular types of students. Such groups can be tracked across time to see if there are improvements, especially in sub-groups considered to be at risk and in which the institution has invested program resources. This session will use a case example to introduce participants to types of administrative data used to measure the bottom line and to assess risk, and will address the problems inherent in such data and in their interpretation and use. The session will also draw on participant experience to explore approaches and perspectives used by other institutions.

Background

With the widening access and participation agendas firmly in place and with HEPPP funds provided by the federal government, the onus is now on universities to demonstrate the effects of their initiatives on retention and success as well as access. Identifying information within an institution's data systems that corresponds directly or indirectly with demographic and background factors known to be associated with lower retention or poorer outcomes in tertiary study is problematic. Universities and university admission centres routinely collect data about individual students in order to manage processes, not necessarily to do research. The information they do collect during application, acceptance, admission and enrolment, may be patchy if certain information is only collected under particular circumstances or for particular pathways into university. In addition, students may not need to provide certain information if not required by these processes. Furthermore, the practices used by staff who handle these processes may change over time, so that an individual administrative data item may change with time. This contrasts with so-called enrolment and results data which accurately documents what a student has studied (courses and subjects) and the grade or outcome of that enrolment. The end result, from a researcher's perspective, can be a data set with in-built unreliability and gaps, particularly with respect to student characteristics, and these may obscure information critical to some research questions. An understanding of these is the key to using administrative data in research (e.g., Rienks & Taylor, 2009), knowing how far it can be relied upon, and the types of questions it can be used to answer. This session will explore these issues in more detail using a case study of a cohort of students that commenced in 2008 at the University of Tasmania, and their progress since then.

Risk—inherent, prior performance and current

Universities assess 'risk' in various ways and for various purposes. Students currently studying may be assessed as being at risk due to missing classes, or failing, barely passing or

not submitting an assignment. Such students can be subject to interventions that provide personal or academic support and the outcomes for those that take it up can be compared with those that do not (e.g., Marrington et al., 2010). Students with a limited educational background or who have done poorly in a previous course may be admitted to a course with probationary status or with an 'at risk' flag. In these two scenarios there is a clear relationship between the identification as being at risk and the possibility of a poor outcome. Apart from educational background, other aspects of risk are rarely so direct and clear cut. Administrative data commonly contains information on demographic background factors, such as age, sex, whether born overseas (and where), citizenship category, whether receiving an access scholarship, and prior educational background features (such as highest prior schooling, year 12 results or other qualifications). While there is a solid relationship between performance in tertiary study and prior educational achievement (e.g., DeBerard, et al., 2004), demographic features are likely to be more loosely associated with differential performance. Furthermore, the 'traditional' student will change over time as access to university by certain groups, such as mature-age students, becomes increasingly normalised. The question that arises then, is whether institutions can identify groups of students at higher risk, and if they can, whether they are able to track these students' outcomes over time. Such data will provide valuable baseline information to institutions that invest in programs that provide diffused support to whole cohorts during and beyond the transition into university.

Measures of successful outcomes

Commonly used measures of success for university students include retention, average performance (grade point average), and completion. For the researcher using enrolment and results data these measures may not be as straightforward as they might at first appear.

Retention

Officially reported retention figures are usually based on post-census data. However, attrition prior to census date can be substantial and certain groups may be particularly vulnerable to early departure. Access to accurate data on student withdrawal means that full withdrawal can be identified within the churn of enrolment changes regardless of when it occurs. Of course, the reason for the withdrawal is not known. Students leave for many reasons apart from those associated with transition difficulties, such as receiving an offer for another (more desired) course from another institution, financial difficulties, making a late decision to have a gap year, obtaining a part-time or full-time job and family or personal reasons. Many such reasons are not negative, that is, the prospective student may be making a sound decision and is in fact choosing to delay study in order to ensure optimal conditions on his or her return. Even though reasons for leaving are largely unknown, monitoring retention across groups and years is likely to identify areas of concern warranting closer examination.

The researcher will need to decide on the time-frame(s) for measuring retention—and may choose for different reasons to focus on any or all of the lead-up to census date, the commencing semester, the first year, first year to second year, and so forth. What can be problematic is handling patchy enrolments, particularly of part-time students, and handling enrolments of spring/summer/winter units. The researcher will also have to decide whether ungraded enrolments (such as in some bridging or induction programs) should be included in making decisions about retention. Interpretation of retention data can be problematic because intention is not generally visible, e.g., some students take a spring or summer unit under an associate degree as a taster or out of general interest but have no intention of continuing

study. Large numbers of such students can skew retention figures and influence interpretation unless the results are considered in context.

Performance

Performance indicators are generally based upon the grade or mark that students obtain in their subjects. Possible measures include highest and lowest grades and the grade range, grade point average (and some measure of variability), and the meeting of minimal progress requirements (e.g., passed more than 50% of load).

Institutional data may include grade point averages calculated for each course under which the student took subjects, over their entire enrolment across all years, and over the past year alone. Students may take subjects under different courses because they lack a prerequisite, are doing a subject out of interest that does not fit within their primary course, are admitted into an associate degree on probation and then later transfer to a degree course, or change their course. Leaving aside considerations of whether grades and grade point averages are meaningful (e.g., Sadler, 2009) researchers will need to decide whether to group all results for all courses and determine a measure of average performance over the time-frame of interest. They will also need to decide whether to use grade point average and other possible performance measures such a percentage of load passed, or some measure of progress towards completing all requirements. Progression may be determined on a semester by semester basis, or by year, or over a set time-frame. However, it is vulnerable to gaps in which a student has no enrolment, and is complicated by students with part-time status.

Since most institutions have a system of academic review to monitor satisfactory academic progress it is also possible to use an indicator based on whether a student has met progress requirements over the time-frame used in the formal review process. This allows identification of students at risk of attrition via the institution's own processes of probation and exclusion, and hence their prevalence in different groups and cohorts.

Measures of variability include the range between a student's lowest and highest grades or some measure of variation in grades. High variability in a student's achievement may indicate, e.g., the sacrificing of more difficult subjects (especially if the student needs to maintain full-time status for financial or compliance reasons), or the intrusion of paid work demands. While the interpretation of such indicators is highly problematic, if there are significant differences across groups or cohorts then further investigation is warranted.

Completion

Researchers should allow sufficient time for part-time and gap students to complete, or should take account of continued study and progression within the non-completing students. While graduation represents the final stage of completing a course of study some students may not appear in graduation lists if they choose to delay graduation and take additional units (e.g., to obtain another major) or if they choose not to attend formal graduation. Completion of the requirements of the degree is a better indicator but may be subject to timing issues if students with credit for subjects taken at other institutions or in other courses take longer to be assessed as having completed.

Other indicators

While retention, academic performance and completion are the primary bottom-line indicators used for comparison of year groups and risk groups other relevant information can be extracted from the enrolment and results data. Post-census withdrawal, failure to attend exams, deferral of exams, supplementary exams, terminating passes and withdrawal without academic penalty grades are a mix of behavioural and performance indicators. They are suggestive of disconnection, not understanding university procedures, struggling academically or of having other impacts on study. If such indicators differ across groups or cohorts then, once again, further investigation is warranted to understand why these differences are occurring.

Cohort identification

Defining the cohort of interest can be almost as difficult as identifying groups that may be at risk. As far as possible, researchers will want to select students who are at a similar stage in their study, for example, all first year students. Selecting students on the basis of commencing status may result in the inclusion of students who have changed courses after completing a portion of their original course, or who have moved from a course within an old course structure to the equivalent course in the new structure. Some of these students can be identified on the basis of taking subjects at higher year levels if subject codes are structured to include a year level identifier, and if this is consistent across all subjects. Other commencing students may be new to the university but have credit for prior study (from other universities, or partner institutions such as TAFE) such that the subjects they take may or may not include any at first year level. Still other students may have taken one or two first year subjects in the previous year (or have enrolled but then withdrew) and no longer have commencing status, but are in fact still first year students. Resolving which students to include and which to exclude invariably involves compromise (and can be technically difficult), especially if full-time first year students are not the norm. It also depends on whether the focus is on first year alone or on both first year and commencing students.

Time frame, data issues and longitudinal indicators

While the research questions should largely determine the time frame over which a cohort is studied, it is often convenient to focus on the short-term. Outcomes for different groups for the commencing semester have understandably generated keen interest as they are critical to designing interventions to improve transition and retention for the diversity of commencing students. However, as progression and completion become key performance indicators for universities, it is important to find out the detail of what is happening in the longer term. For example, do factors known to be associated with poor outcomes in the commencing semester continue this association in the longer term? Is an improvement in how a group performs within a cohort over several years associated with a loss of students who did less well early on, or do such students stay and do better? Of those students who leave study early, how many and who comes back in the subsequent semester or year?

One of the issues that needs to be considered is the number of point in time indicators generated for these students over the time-frame being studied, and whether these add to the understanding of what is happening within the cohort, or merely to the complexity. It will usually be necessary to experiment with different indicators and composite variables based upon them in order to determine which are most useful in summarising the major results arising from the data.

Session plan

As the sole tertiary education provider in the state the University of Tasmania handles its own application and admissions processes. This allows researchers to have ready access to staff with knowledge of processes and administrative data items and the historical development and context for these items. Using the 2008 commencing cohort and the outcomes for 2008-2010, the presenter will take the participants briefly through the study process, highlighting the issues that arose. It is expected that participants will ask questions, and add to, and elaborate on points on the discussion using their own studies and experience as examples. The intention is to identify the range of potential risk factors currently receiving attention and identify ideal baseline data that should be held about all students.

Risk factors

- Presenter: UTAS risk factors, stability over time, inherent and actual risk
- All: other risk factors used at own institutions, how collected, reliability

Cohort selection

- Presenter: commencing vs. first year, who is out and who is in (and implications)
- All: student profile and implications for cohort selection

Point-in-time outcomes

- Presenter: outcomes for commencing semester by risk group and the remainder of the cohort, risk load (number of risk factors) and outcomes
- All: retention and performance outcome measures—use and alternatives

Longitudinal outcome measures

- Presenter: connecting the dots—outcomes by year and overall
- All: which points in time are most useful, is the devil in the detail?

Ideal data

- Presenter: general background data, risk factors—what is missing or unreliable?
- All: other approaches, what is ideal background data on students?

References

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