# Emerging evidence from using an ecological data framework for student learning and development

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## Abstract

*Many university co-curricular programs or services are under pressure to demonstrate performance excellence and justify their continued existence. Many of these programs or services also resort to collating easily accessible data such as input, transactional and overall satisfaction data; produce some descriptive statistics; and subsequently write business reports that show the programs' effectiveness or efficiency. However, this common practice is arguably the wrong place to start. A better starting point would be locating these programs within an ecological educational environment, and one that is aligned with the sector's regulatory compliance requirements and expectations. A metaphor for this would be Russian dolls. Presented here is an initiative where an ecological data framework was designed by a student learning and development unit, which was then deployed with a vision of collecting significant data that can ascertain their programs' impacts on student outcomes of progression and academic achievement.*

## Introduction and Rationale

Co-curricular learning programs, better known as learner assistance programs (LAPs), such as academic advising and tutoring, have long been used by universities to support students not accustomed to, or far removed from, academic endeavours or simply lacking the self-confidence to navigate courses on their own for whatever reason. While these LAPs have demonstrated statistically significant positive results regarding student learning (Arendale, 2010), there seems to be a mixed view of the impacts of LAPs in terms of the resources allocated as funding models shift based on changing priorities (Keller, 2012). Part of the reason for the mixed view is the immanent (braided or embedded) nature (cf. Deleuze, 1988) of these programs in relation to the classroom/online learning management system front-end experience that blurs or masks LAPs impacts. Consequently, LAPs are constantly at-risk of being culled or reduced during times of tight budgeting as their value offering is not seen as sufficient or compelling. They are considered a 'productivity problem' (Meyer, 2006) in that these programs are considered to be primarily remedial and thus tap into badly needed funds from other more 'worthwhile' programs. In order to counter this threat or mitigate the impact of threatened or soft money funding, LAPs have to "determine an ongoing need for each program's services and in some way monitor their effectiveness" (Norton & Agee, 2014, p. 5).

This paper reports on the voice of a student learning and development unit at a regional university in Australia that attempts to resolve this dilemma by initiating an initiative known as the Quest for Student Success or Q4S.

## Outline of the initiative

Moore (2004) argues that higher education institutions are better at identifying 'smartness' than developing 'smartness'. On the other hand, a 'do nothing sink or swim' approach that existed in Australian universities at the turn of the 21st century (Skillen, Merten, Trivett, & Percy, 1998) is no longer acceptable today. Learning support, however, does not mean dependence but rather getting students to the point where they can be successful on their own (Truschel & Reedy, 2009). With constant internal pressure to show impact, a student learning and development unit of a regional Australian university decided to find a possible solution. Thus, Q4S was mooted.

Q4S is an innovative initiative with the aim of developing a theoretically driven ecological data framework based on an ecological education environment proposition by Kek and Huijser ( 2017). The framework is to assist the unit in creating a snapshot of whether the LAPs are impacting on student outcomes. In terms of outcomes, the unit intentionally aligned the outcomes to TEQSA's (2014) risk assessment framework that describes outcomes as: cohorts completed; student load; attrition and progress rates; completions; student satisfaction; and graduate destinations. These defined outcomes determine the regulator's view of what constitutes an overall risk to students. For this initiative, two outcomes were tested. They were progression rate and grades to represent academic achievement.

This initiative first started with the development of a theoretical framework. Based on the theoretical framework, a data analytics framework or architecture, as seen in Figure 1, was designed. The main purpose of designing the data analytics framework was to guide the unit with testing what data would be sufficient to ascertain the LAPs impact/s on student outcomes. The design and development stage commenced in late 2014, with data testing completed and findings gathered in 2015. Student data of LAPs from 2013 and 2014, Semesters 1 were tested.

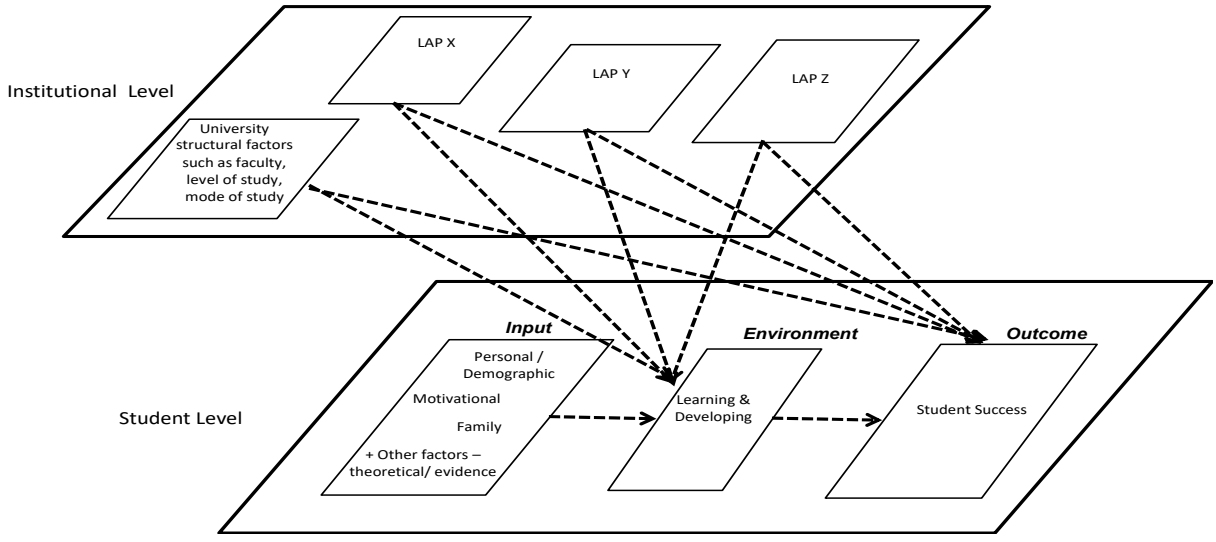


***Figure 1. Ecological data framework[1]***

[1] Framework adapted from Kek & Huijser (2011), Bronfenbrenner (1979) and Astin (1984)

## Method

As this initiative was a proof of concept and data testing, quantitative methods were considered. Many of the quantitative 'input' data were sourced and extracted from local and university databases. They included students' demographic information, mode of study, faculty, study level, campus enrollment characteristics, number of courses enrolled in, and grades achieved for the courses enrolled in. The 'environment' data are a measure for the learning and development processes and are collected through students' evaluation of their experience and time spent with the different LAPs. The 'outcome' data of students' course progression rates and grade point average (GPA) were calculated during the data analysis.

The data were analysed using the IBM SPSS Statistics version 22. A hierarchical multiple regression method was used to predict the relationships between individual characteristics, university contextual factors, and engagement with LAPs, allowing each predictor variable on the dependent variables — progression and academic performance — to be assessed (Tabachnick & Fidell, 2013).

## Did it work?

Technically, yes, it did work. Echoing Cooper (2010), Pascarella and Terenzini (2005) and Scott (2008), the data testing did provide empirical support that demonstrated that student engagement in the selected LAP did contribute to student success. The regression analyses indicated that students' high academic performance and progression rates were attributed to the interplay between individual student characteristics and their engagement with the selected LAP.

## How this initiative builds or extends existing knowledge?

This initiative extends existing knowledge in the following ways:

1. The impacts of the LAP on student outcomes were positively correlated, which is expected according to Keimig's (1983) hierarchy of LAP. The effect sizes are relatively modest but it was the discovery of which meaningful 'hard data' contributed to student outcomes that was significant to further understanding of the student success puzzle.
2. It builds on Bronfenbrenner's (2006) proposition that both proximal and distal contexts and processes are responsible for effecting developmental outcomes, even though the proximal processes in the individual's immediate environment are more potent. This initiative demonstrated that the LAP had indeed provided a meaningful environment in the university and assisted to facilitate some students' learning and development.
3. The findings also echo Pascarella and Terenzini's (2005) empirical studies that have demonstrated that the quality of student effort, student background and pre-university traits, as well as interactions with socialising agents in universities, can directly influence learning and student development; where all other institutional variables are indirect influences.
4. The data framework can be applied more broadly through adaptations by other university ecologies such as the Library, Student Services, Course or Program Student Evaluation, and Exit surveys.

## What are the lessons learned?

For organisations intending to adopt this initiative, the following questions learned from the initiative could be used to guide adoption:

1. Is the unit and/or its LAP structured to pursue evidence-based decisions and actions?
2. Is there support from leadership or senior management within the unit and/or higher up?
3. What does the unit and its staff need and want to know?
4. What is the context for the evidence that has to be provided and its interpretation?
5. What is the theoretical grounding of the unit's practice? How consistent is it with the data initiative?
6. Where to begin? How to get started?
7. What data do you have? Where are they located? How complete are they?
8. What are the ethical issues to accessing and collecting the data?
9. Who else in the university would you need to collaborate on this initiative?
10. What actions can be taken post-findings?

## Conclusion

The key finding of the initiative is that even after controlling for gender, residency status, level of study, faculty and study mode, the amount of time students spent engaged in LAPs is predictive of improved progression rates and GPAs. Even though the effect sizes of the various LAPs ranged from small (0.07) to medium (0.30), this initiative has provided important insights into the influences and impacts the varied university contexts and LAPs have on student success. It highlights that student success must be a shared responsibility between the students, administrators, academic and professional staff (Kek & Huijser, 2017; Kuh Kinzie, Schuh, Whitt, & Associates, 2005). The concept of interconnectedness in the university ecology is significant in activating and facilitating student involvement and engagement in their learning and development processes, and subsequently, to achieving student success. The next step is to collect student experience and motivational data to investigate the psychological processes and elements of the LAPs that attract students to be engaged in the LAPs.

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