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Using assessment submission data to provide timely and contextualised academic support

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While it is well accepted that integrating academic skills into the curricula is best practice, in reality it is not always accepted by institutions. Such integration involves both contextualisation and appropriate timing. This presents real issues for adjunct academic language and learning centres that are centralised, rather than part of a specific faculty or course. To some degree, the issues arising from this disjoint can be minimised by the use of university-wide submission data indicating when students are required to submit their assessments. The overall objective of this paper was to identify how submission data could be used to contextualise and embed academic support services and improve the availability of those services during peak times. Specifically, it used a mixed methods approach to: a) investigate how assessment submission data could be employed to provide better timed and contextualised workshops; and b) how that data could be applied to predict the demand on an academic drop-in centre. The results of the study were twofold: first, that assessment submission data can be used to inform when and how contextualised academic support should be provided. Secondly, that assessment submission data can be used to inform when students require academic support services, and consequently staff those services appropriately.

Key Words: Temporal Learning Analytics, Assessment-Data, Embedded Academic Support; Drop-in centre, timely support, contextualised academic workshops.

1. Introduction

This research was based on the notion that students who require support are often not those who seek it, recognised by Harris and Ashton (2011, p. 76) as a distinct pattern in the literature. It was guided by the overarching question: "how will this workshop (and our contribution) make a difference to the students involved?" Reflecting on current practice and the individual learning objectives of a series of generic academic seminars for numeracy, literacy, research and study skills, it became evident that the content taught was not effectively supplementing the overall education of students. That is, it failed to meet the ideals of contextualisation and appropriate timing, both listed by the Department of Education, Employment and Workplace Relations (DEEWR, 2009) as elements of good practice principles for the development of English language proficiency in university students. The study recognised three particular failings of the workshop content. First, it was not practically relevant or engaging. Secondly, it was not contextualised in their subject domain – seminars were often developed in isolation from subject matter and specialised in a

single specific academic skill. Thirdly, it was not appropriately timed, as the seminars were only delivered routinely each week at lunchtime rather than timed in relation to the submission deadline of particular types of assessment items. This paper addresses these shortcomings, by examining how student assessment data can drive just-in-time contextualised academic support workshops for faculty, staff and students. A serendipitous secondary outcome of the study was that the submission data could also be used to inform staffing requirements in the student drop-in centre. A key benefit of the use of an action research-based methodology to pursue these objectives, was that the practice informed the research through an iterative method of doing and reflecting, which itself continually informed the process. The use of assessment data to inform academic support practice in this way appears to be a useful and novel approach. The significance of this research rests with its ability to: a) provide more timely and contextualised academic support models, and b) inform appropriate staffing of academic consultation centres during peak periods.

The paper is structured in seven sections. Section 2 provides a brief overview of the context and setting of the current study. Section 3 offers an overview of the literature in the field of "embedded" academic support within the curriculum to establish the rationale for using data to facilitate "embedded" practices. It also recognises the benefits of centralised academic support services to establish the rationale for using submission data to optimise staffing and services during peak times. Finally, it draws from the literature on temporal learning analytics to examine how time-based submission data can be used to inform academic support services. Section 4 details both the qualitative (content analysis) and quantitative (regression analysis) research methods. This section explains how the data was collected, organised and thematically categorised, and how predictions were made. Section 5 describes the general approach of how submission data was used in the service of better workshop timing. The section also offers a brief account of one successful case study as a result of the data analysis. Section 6 analyses how submission data was used to predict drop-in centre demand. In particular, the strength of correlation between submission data events and days of the week in the academic drop-in centre is determined. The conclusion offers direction for future researchers considering using submission data to inform their academic support practices.

2. The context of the study

This study was conducted at a medium-sized public university in South Australia with 27,762 students (in 2018), supported by 2,635 staff members (Flinders University, 2019). The Student Learning Centre (SLC) where the study was conducted, is a centralised academic support centre offering academic support to all students, both on-campus and online through Skype consultations. Six full time academic staff members and several casual academics ensure the day-to-day operation of the centre. In 2016, the SLC provided three key services: a) generic lunchtime workshops (adjunct approach); b) workshops as requested by faculty (embedded approach); and c) an academic assistance drop-in centre. This paper studies these services in two parts. The first focus of the study examines a shift from the generic workshops towards provision of additional embedded workshops.

The second focus of the study was the University's "Learning Lounge", an academic drop-in centre located inside the central library that offered a range of support options in numeracy, literacy, and study skills. No appointment was necessary for the Learning Lounge, which was open Monday – Friday between 10am and 4pm and often from 5pm to 7pm as an after-hours service. Every year, approximately three thousand students visit the drop-in centre, most of whom seek support in referencing, grammar and essay writing (see Figure 1). Between one and five members staffed the centre, depending on the time of day. Adequate staffing had historically been an issue as it was hard to predict student drop-in patterns and thus mitigate peak periods with the support of extra staff members. Some coarse-grained strategies were applied to address this issue; for example, there were often less staff during weeks leading into the semester as well as weeks after examination periods. However, no finer-grained strategy or data-informed practice was utilised

to coordinate staffing with likely student demand. Thus, an objective of this research was to find a method to identify when students seek support and how this could be used to staff academic assistance services accordingly.
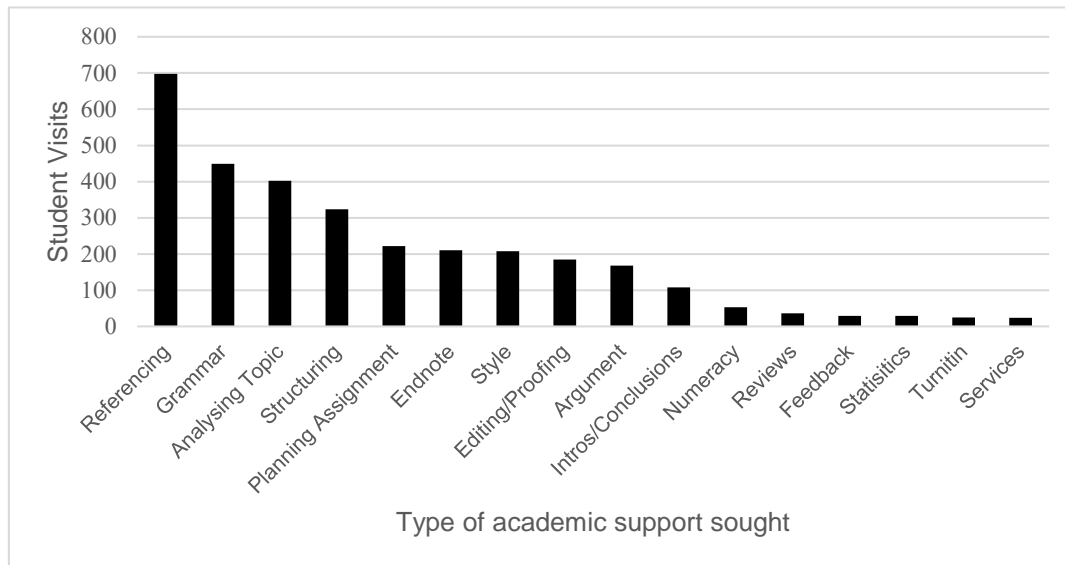
Figure 1. Amount and type of academic support sought in the Learning Lounge in 2016.

3. Background

3.1. Contextualised academic support: a historical and academic review

This section offers a brief overview of the debates within academic language and learning literature to demonstrate the benefits of contextualised academic support, and thus how the collection and analysis of submission data may optimise these benefits. Martin and Ramsden's (1978) paper was one of the earliest to identify the benefits of embedded support; they found that integrating academic study skills into the curricula was more beneficial to students than teaching them as separate activities. A number of authors have similarly found benefits to embedding academic support workshops in the curriculum. For example, Purser, Skillen, Deane, Donohue, and Peake (2008, p. 6) undertook one of the first critical evaluations in this field and found cross-disciplinary academic support collaborations that linked academic skills within the faculty led to stronger inter-faculty relationships, and subsequently the inclusion of writing staff in curriculum design. Comparable benefits were seen by Huijser, Kimmins, and Galligan (2008), who noticed that embedding academic skills shifts academic support from the "fringes" of the university into a core part of the curriculum and transforms a deficit, remedial, and reactive service into a proactive, early detection model. Veitch, Johnson, and Mansfield (2016) reinforced the benefit of standardising support for all students, noting that embedded support "moved adjunct support of some students to an integrated curriculum that benefits all students" (p. 1).

3.1.1. The arguments for embedded academic skills

Integrating academic skills in curricula is now considered best practice for many reasons. For instance, it helps all students, beyond those proactively seek academic support. Second, students prefer, and understand academic support more comprehensively when it is contextualised in their area of study. Third, assessment support relevant to their upcoming assignments can be provided on a just-in-time basis. Fourth, it offers a new avenue to meet the particular needs of Culturally and Linguistically Diverse students (CaLD). Fifth, students can make sense of the purpose and place of integrated academic skills training when the construction of new academic conventions

is built on previous knowledge (Harris & Ashton, 2011). The benefits of this integration are noticed within the literature; for example, Hammill and Awhina (2007) reported increased grade averages. Mort and Drury (2012) demonstrated higher student grades when report writing was integrated into the curriculum. Porter and Swing (2006) also found that focused academic preparation support was more effective than generic first-year preparatory workshops. Wilson and Lizzio (2008) observed that their just-in-time academic recovery intervention methods afforded higher pass rates and higher rates of assignment submission than traditional means.

For others, the argument for embedding academic skills relies on context (Laurillard, 1979). Lea and Street (2006) indicated that academic literacies should move beyond study skills to include a repertoire of transferable linguistic practices that could be applied in multiple environments. Chanock, Horton, Reedman, and Stephenson (2012) noticed that using language specific discourses within the students' curriculum also increased engagement. In their good practice principles, the Department of Education, Employment and Workplace Relations (DEEWR, 2009) also focused on the need to contextualise and integrate academic support within the curriculum.

The benefits demonstrated in these studies thus encouraged us to pursue qualitative data regarding embedded academic skills (see Section 4.2 for details on the qualitative data collected and analysed), and subsequently how to optimise the benefits of those skills using submission data.

3.1.2. The barriers to embedding academic skills

Despite the above-mentioned advantages of embedding, challenges often arise when embedding academic support in the curriculum, which can lead some universities to adopt a non-embedded or generic academic support option instead. For example, faculty members may not always know how to embed academic skills and non-faculty-based staff may be unsure who to liaise with. According to Jones (2009), academics themselves may not be confident in applying or developing these skills independently. Deciding who owns and is responsible for doing the work is often the first challenge that needs to be overcome (Chanock et al., 2012). Academic advisers also often require support from management and can find embedding skills time-consuming and resource intensive. Moreover, aspects of the curriculum must be changed in conjunction with subject co-ordinators and with a particular learning design or pedagogical scaffolding model in mind. McWilliams and Allan (2014) suggest a best practice model that considers these constraints and challenges and which will support increased faculty adoption of this approach. However, a shortcoming of any broad-brush framework is that each university support environment differs, and the ease of adoption will depend on whether the unit is centralised or not.

It should also be noted that the decision to embed or not to embed is often left with senior management and not the academic adviser (Thies, 2012), who can be left to "band-aid" academic "wounds" rather than provide pedagogically sound, and scholastically relevant support services (Strauss, 2013). For real integrated practices to occur, Peacock (2008) maintains that institutional support is vital. Nevertheless, the authors take a position similar to Pocock (2010) in the New Zealand setting, who suggests that despite its time-intensive and resource dependent aspects, the benefits of collaboration with faculty outweigh the initial energy investment that is needed. Consequently, one goal of analysing assessment data was to assess how to optimise the benefits of timely ad hoc seminars as requested by faculty members (see Section 5).

3.1.3. The continuum of "embedded" models

Over the last two decades, synergies between academic adviser and faculty have been described as a continuum of embedment. While the terms may differ among authors, the underlying meaning is the same. Comparable terms include: cooperation, collaboration or team teaching (Brooman-Jones, Cunningham, Hanna, & Wilson, 2011); the integrated online resource model (Dymock & Floyd, 2017); and "built-in" or "bolt-on" (Wingate, 2006).The language used to describe the type of contextualised support in this study follows the conceptualisation of Maldoni

and Lear's (2016) staircase model that builds on earlier work by Harris and Ashton (2011). In this model, "adjunct" involvement refers to working outside the subject domain, providing external resources and support. The "embedded" approach is where academic advisers work more closely to co-teach in the curriculum. On the other side of the ladder, the "embedded-integrated" approach involves team teaching, perhaps within a unit-specific, credit bearing course. The various services that the SLC provides sit in different places on this continuum, although the generic academic workshops in particular would be considered an "adjunct" approach. This study aligned with Maldoni and Lear's staircase model in the first section of this study in order to methodically organise a sound structural shift from the "adjunct" approach towards the "embedded and integrated" approach, whereby workshops would be provided ad hoc to individual faculties.

3.1.4. On the value of retaining one-to-one academic support

While this paper recognises the importance of embedded academic support, one-to-one student assistance provides an opportunity to address student needs that are not met by academic skills seminars. The need for one-to-one support is often under-reported in the literature (Chanock, 2007) and often, the onus to continually defend and promote its critical role to the university community rests with academic advisors. Huijser, Kimmins, and Galligan (2008) highlight that individual consultations are an integral component of any academic support unit or model, in conjunction with other academic support strategies. Using various evidence-based case studies, Huijser, Kimmins, and Galligan (2008), argue that these consultations offer space for students to address assessment needs and challenging topics; provide emotional support and confidence, and further support scaffolded learning. Webb, Zhang and Sillitoe (2002) outlined that their first point of reference in the development of new resource guides in business teaching was to ask academic advisors what their students' needs were. They then used this to develop their resource guide. This paper heeds Chanock's arguments (2007. p. 7) that individual consultations are "what makes ALL group teaching richer, more pointed, and more persuasive than it would otherwise be, because it starts from students' own understandings and respectfully acknowledges their thinking". For these reasons, this paper chose to assess how student submission data could be used to optimise the benefits of one-to-one consultations at the drop-in centre.

3.2. Literature review: Temporal Learning Analytics

In designing the method for this research, this paper found it beneficial to follow the guidance of Bakharia, Corrin, et al. (2016), who linked and developed a framework into which both learning analytics and learning design were integrated. As Reimann (2009) put it, although "researchers have privileged access to process data, the theoretical constructs and methods employed in research practice frequently neglect to make full use of information relating to time and order" (p. 239). Another often underestimated aspect of learning design is the integration of learning analytics and temporal analysis. As Knight, Wise, and Chen (2017) noted, learning analytics requires temporal analysis to inform: a) how timing affects the learning context and b) how practical methods can be employed to better understand such environments.

Bakharia et al. (2016) listed three methods by which analytics could be used to inform learning design: "cohort dynamics", "tool specific analytics" and "temporal analytics". The latter is a type of analytics that is based on time (Bakharia, Kitto, Pardo, Gašević, & Dawson, 2016). For instance, one factor that could be analysed is the length of time students stayed in the learning management system and which content was reviewed multiple times. This could be classified by week, by course, or by duration. Of particular concern to this paper is the subcategory of temporal analytics known as "submission events", which is data that relates specifically to submission dates of assessments (Bakharia, Corrin, et al., 2016, p. 3). Importantly, Lockyer, Heathcote, and Dawson (2013) outlined how learning analytics can be used in conjunction with data-driven, "process analytics" and content analysis to better understand the roles taken by each participant in the

learning design when completing tasks. This can therefore help inform "potential support structures" (p. 1448). In this way, the data could offer insight as to how to optimise learning support practices; such as when to offer ad hoc skills seminars, and how to identify appropriate staffing of the academic drop-in centres throughout the semester. Subsequently, this study found it profitable to explore submission data as a form of temporal analytics to inform the requirements of faculty members for support services and the University's academic drop-in centre, and thus determine how to optimise the benefits to students.

It should be noted this research is not the first to use time-based learning analytics with respect to assessment data. Such data has been used previously to examine time spent during examinations per question (Papamitsiou & Economides, 2014); and as a method to visualise time spent on particular assessment activities (Papamitsiou & Economides, 2015). However, information on timing is not limited to time spent on task and may also be used to identify how due dates for submission events on assessment items can inform various academic support services. To the authors' knowledge, this paper is the first to use temporal learning analytics for the purpose of academic support. Other models that utilise this type of data have been used to ensure that students are not overloaded with assessment tasks at particular points in time.

4. Methodology

4.1. Research Question

The current study was driven by the following research questions:

1. In order to facilitate a shift towards embedded academic support practices, how can student assignment submission data inform when to provide timely skills workshops?
2. How can student assignment submission data better inform staffing requirements in academic assistance drop-in centres?

The rationale for these questions was to understand how to provide more contextualised and timely academic workshops through a limited scope (i.e. submission data), and to find more accurate methods to manage staffing levels in the student drop-in centre.

4.2. Research method: Content analysis (used for workshop timing)

The data set included 2,485 assignment submissions for Semester 2 of 2016. Only 1,732 assignment submissions were included in the data set as the submission dates were missing from 588 assignments. Hence, 23.7% of the data was excluded, which may have impacted the results of this study. In the spirit of content analysis (see Mayring, 2004), the research went through three phases. The first phase gathered the raw data and ordered the submission dates in ascending chronological order to see what patterns emerged. Secondly, the data was organised into categories based on key words. Finally, reporting involved evaluation of the data with other conceptual models in an effort to offer some level of abstraction on data driven student support models. The goal of this method was to identify peak times for assessment submission among faculties and subsequently when to offer ad hoc academic support services to faculty members.

For academic advisers working in the faculties, understanding assessment due dates and types of assignments that tend to occur often provides new insight in offering contextualised academic support. This paper offers a practical method for advisers to engage with the data in a meaningful way. One consideration to note for others looking to reproduce this study is that this process would likely be different for academic advisers working within their faculty, as their data list of all courses would inevitably be substantially smaller.

4.3. Research method: Regression analysis (used for drop-in centre demand)

A least squares regression analysis was used to predict the average number of drop-in visits on the basis of the number of students with assignment submissions in that period. The predicted relationship was

$$\text{Predicted no. of visits} = b_1 \times \text{the expected no. of assignment submissions} + b_0,$$

where b_0 represents the number of students expected if there were no deadlines, and b_1 represents the number of additional visits per student deadline. Note that this relationship assumes no periods of significant unmet demand. In relation to this assumption, it is necessary to note that while attendance records did not quantify students who left because of queues, this is likely to be an extremely small number. With a combined total of 14 years of experience in the centre, the authors would estimate that less than one in a hundred students would leave without being seen.

A second aim of the regression analysis was to identify how closely the volume of academic drop-in visits is related to submission events and then use it to predict that demand. Variability around this relationship (indicated by the scatter of points around the line) can be attributed to external factors such as the identity of the faculty setting particular deadlines and the proportion of students who would typically seek assistance amongst those affected by the deadline.

Ultimately, the relationships identified at different temporal scales here provide useful data to inform staffing practice within the drop-in centre. The relationship is not sufficient to shed much light on day-to-day fluctuations, but it could be used to predict changes between weeks. It could be reasonably claimed that drop-in centre attendance records from previous years could be used for this purpose, but such an assertion would rely on uniformity of assessment deadlines across years. The relationship identified by this research on a weekly scale provides a method to inform staffing requirements which adapts to changing assessment regimes. It also becomes useful at times when new services are initiated.

5. Use of submission data to offer timely and contextualised support

5.1. General approach to using submission data for workshop timing

Data was collected from the Data Analytics Unit, who provided a spreadsheet of every assessment piece due in Semester 2, 2016. This included the due date, the type of assessment activity and the subject name. The data was analysed by ordering the data in ascending order based on submission dates. Once ordered, the data was separated into academic assessment categories and faculty categories. For instance, a separate worksheet tab was made for all assignments containing the phrase "Literature Review" (see Figure 2). The data was then organised into clusters according to the faculty affiliation, whereby a relational database was made in Excel linking student numbers in each of the courses to the course deadline data. This indicated when large numbers of students had particular deadlines. For instance, course codes starting with EDUC included the Faculty of Education, Humanities and Law. Once organised, the subject coordinators in charge of the subject were individually emailed to identify their interest in developing a collaborative partnership to embed academic skills sessions. All lecturers contacted endorsed embedded support for their course in varying capacities, and were often surprised about the level of detail the academic advisers knew about their courses. Many academics took the time to send out rubrics, essay guidelines and overviews to give context to the subject area. From here, a tailored approach was designed that was specifically adapted to the subject area. This resulted in specialised support that was relevant to students, from researching skills to developing an essay plan.

Some assignments were excluded from the study because staff did not include a deadline.

	A	B	C	D
1	Column1	Column2	Column3	Column5
2	SCME7054	2016	Revised Literature Review or equivalent appropriate technical review	1-Jan
3	ENVS9750	2016	Literature review and needs analysis/scoping document	1-Jan
4	LANG8503	2016	Draft Literature Review and Abstract	1-Jan
5	HLTH3105	2016	Background Literature Review	21-Aug
6	HLPE3533	2016	Literature Review Assessment - Critique #1	26-Aug
7	POAD9050	2016	Required Activity 2 - Literature Review draft	29-Aug
8	SOAD3006	2016	Assignment 2 Literature Review	5-Sep
9	ENVS3781	2016	Critical Review (500 words)	5-Sep
10	ARTS3000	2016	Literature Review	9-Sep
11	MHSC9033	2016	Assessment 3 Literature Review (first draft)	9-Sep
12	HLTH1306	2016	ASSESSMENT EXERCISE 4 (AE4): SYSTEMATIC LITERATURE REVIEW DROP BOX	12-Sep
13	BIOL8700	2016	Literature Review	12-Sep
14	BIOL8700	2016	Literature Review	12-Sep
15	NUTD9165	2016	Literature review	16-Sep
16	MIDW3305	2016	Assignment 1 Submission Box: Literature review	7-Oct
17	NURS9220	2016	Draft Literature Review and presentation of tables	14-Oct
18	INTR7017	2016	Literature Review (MA only)	21-Oct
19	EDUC9708	2016	Assignment 1 Literature review dropbox	24-Oct
20	SPTH3902	2016	Literature Review	4-Nov
21	MIDW2202	2016	Assignment 2 - Literature review	18-Nov
22	DVST9032	2016	Assignment 1: Review	22-Nov

Figure 2. Example of assessment submission data organised by the submission type "Literature Review" and in ascending order by date for Semester 2, 2016.

5.2. Case study: The first contextualised academic workshop

To give an example of how the data was used, the course DVST9032 "Gender Mainstreaming" will be used here as a case study. It represented the first successfully embedded workshop identified by this method. The course coordinator was contacted by email asking if they would like the opportunity to provide a contextualised workshop for their upcoming literature review assignment. For this assignment, students were required to write reflections each week that developed towards a larger literature review. Many of these students needed support in researching, referencing, writing and argument construction. Although these generic academic skills sessions are typically run separately, a tailored adjunct workshop taught the students how to find research articles. Students were first shown how to find scholarly articles relating to their discussion forum, and then shown how Endnote can import them into a Microsoft Word document. Students were then taught how to develop a well-structured argument, creating a response to their discussion question that would develop towards a larger literature review. The attendance data was subsequently provided to the relevant lecturer. Interestingly, nearly all students attended even though this was an optional class.

6. Using submission data to predict drop-in centre demand

The timing of "just-in-time" assistance is not simply the prerogative of staff. Students often reach for assistance as deadlines loom (Tuckman, 2005), sometimes as a result of procrastination, rationalisation, and/or a lack of self-regulation (Tuckman, 2005). Staff within a course can easily predict this as they are familiar with the deadlines within their own courses. This is clearly more complicated for a centralised academic assistance unit that provides generic assistance across all of a university's courses. However, the advent of electronic submission processes has presented a tool that can assist the process.

By aggregating the submission data already described across all topics on campus, it is possible to produce a graph that displays the number of students who have submissions on any given day of the semester, thereby potentially identifying peak periods of demand within the academic help centre. While it is possible to aggregate at different temporal scales, and it would be possible to use different filters to try to better predict activity (for instance incorporating lead time prior to assignment submission), at this stage it is simply utilised in a "proof of concept" phase.
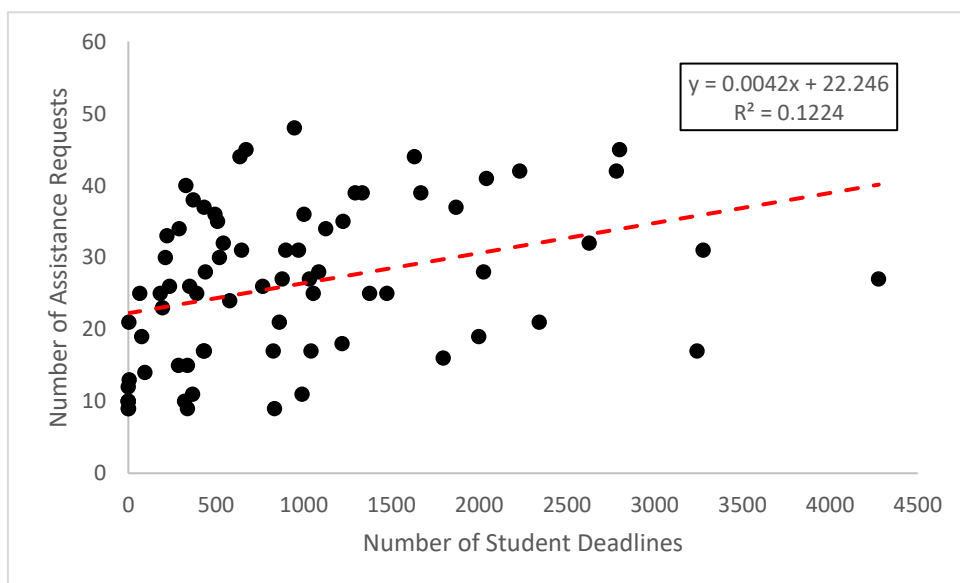
The number of students with a deadline on any given day was non-randomly spread across the semester. The pattern is demonstrated for the first half of semester 2, 2016 in Figure 3. Such a view may assist the University to better manage the staffing levels of the academic assistance centre.
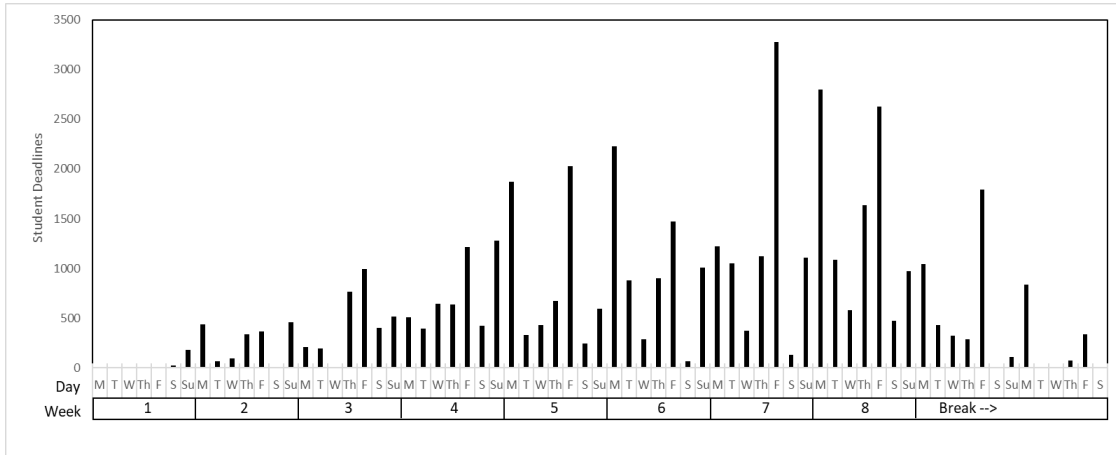
Figure 3. The number of students with deadlines on each day throughout the first half of Semester 2, 2016.

When aggregated at a daily temporal scale, a tight relationship between the number of student deadlines on a given day and the number of students visiting the drop-in centre would help accurately predict staffing requirements. While a significant positive relationship was identified (Figure 4; Pearson's $r = .350$; $p = .002$; least squares regression), the R^2 value of 0.1224 indicates that only 12.24% of variability in visits can be predicted from knowledge of the quantity of deadlines on a given day. Thus, approximately 88% of the variability is determined by other factors. With such a large uncertainty in this relationship, this temporal scale is evidently unsuitable as a predictor of staffing requirements. However, note that this conclusion is relevant only to the day-to-day (i.e. fine) scale.

$$y = 0.0042x + 22.246$$
$$R^2 = 0.1224$$

Figure 4. The relationship between the number of students with deadlines and student assistance requests at the scale of the day.

It is also relevant to ascertain whether deadline quantities could be used to predict student demand for the academic assistance centre on a more general (weekly) timeframe. To test this, data from both the assistance centre visits database and the deadline quantity database were aggregated at a weekly level, and a linear regression was again performed to identify any relationship.

A far tighter relationship is evident when data was aggregated at the weekly level, where the relationship has an R^2 value of 0.7422 and is statistically highly significant (Figure 5; Pearson's r = 0.862; $p < 0.001$). This information indicates that when the data is aggregated at this (weekly) scale, deadline quantity can explain 74% of the variability in student assistance request quantity. A suggested reason for this much stronger relationship at the weekly as compared to the daily timescale is that students are likely to approach the academic support services in the days leading up to the submission of the assignment, rather than only on the day of submission. It is worth noting that the regression equation indicates that if there were no deadlines in a given week, approximately 60 visits to the academic drop-in centre would be expected during that period. These are students who attend despite no impending deadline. This baseline number of requests thus informs the minimum amount of staff that are required at the drop-in centre at any given time. Thus, whilst analysis of the deadline quantity data does not provide a management tool for predicting day-to-day staffing requirements, when aggregated at a weekly scale, it can provide a very useful indicator of the staff numbers required each week.
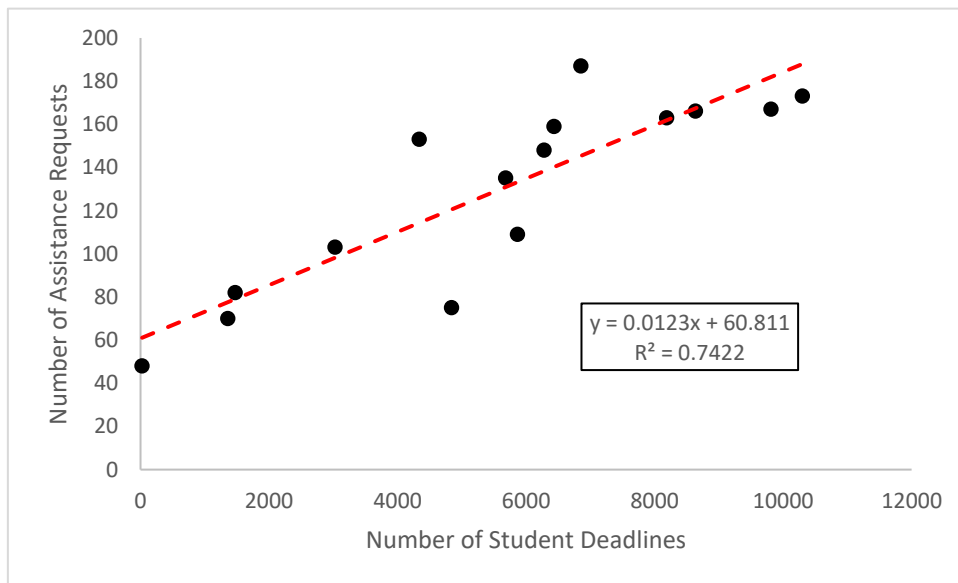
Figure 5. The relationship between the number of students with deadlines and student assistance requests at the scale of the week.

A caveat to this research is that submission learning analytics does not account for several mitigating factors that may otherwise affect demand for the skills workshops and academic support services. For example, this study did not record the maximum number of requests that could be accommodated at the drop-in centre per day (i.e. saturation), which may have discouraged some students from seeking the centre's assistance in the future. Moreover, unpredictable numbers of assignment resubmissions later in the semester may affect the demand for academic support services. These are presently unaccounted for by submission data analytics. Additionally, unavailability of staff members due to holidays taken prior to exams, revising resources and updating other learning materials may increase the demand for academic support where students cannot receive it directly. These factors are also unaccounted for by submission data analytics. Finally, some students requiring more intensive support from academic staff, perhaps due to academic integrity issues or failures to meet the minimum course requirements, may increase demand for staff at the

drop-in centre. Nonetheless, this work represents a good starting point for making evidence-based decisions.

7. Conclusion

This study employed a mixed-methods approach using both quantitative and qualitative data. Qualitative analysis supported how best to reach out to lecturers to provide contextualised assistance that was timely and relevant, which afforded a rationale for timely embedded skills seminars. Quantitative data was used to broadly identify staffing needs for academic support services. Quantitative analysis supported the notion that the requirement for student assistance increased as deadlines approached (at least when measured on a weekly level) and thus provided a numerical basis to help inform staffing levels at the drop-in centre.

This paper does not analyse the approach's success. However, it is presented as a potentially useful tool in improving academic language and learning processes. The study had two main findings regarding submission data. Firstly, submission data can be used to provide better timed and contextualised workshops. Secondly, it can be used to predict the demand on an academic drop-in centre, and thus allow institutions to better tailor staff resources. Future studies could use this information to design a more even spread of assessment and workload across a given course by mapping all assessment due within a particular program of study. In addition, others could analyse and evaluate the success of the approach from the viewpoint of both students and subject-based staff. As with so many issues in tertiary learning, a good approach has utilised an intelligent combination of qualitative and quantitative data to drive better academic support services.

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