Engaging students: encouraging success

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New university students need to enjoy early academic success to engage fully with their learning community from the start of their first year. Yet in the first few weeks students are so overwhelmed with new experiences and demands that they can misread the learning environment and underestimate the relevance of early attendance and assessment to their final grades. Students unaccustomed to managing their own study can find their focus easily directed away from assessment. The 'Supporting students at risk'(SSAR) strategy is an initiative within the Division of Information, Technology, Engineering and the Environment (ITEE) and supported by the Learning and Teaching Unit (LTU) at Mawson Lakes campus of the University of South Australia. Through SSAR student attendance and their early results in core first year courses are monitored. Those who may be struggling are contacted and encouraged to adopt study and personal management strategies that will increase their chances of success. The strategy has a clear focus on providing options and support to foster success in assessment. This paper describes the implementation of SSAR in the new common first year engineering program in 2008. In particular it examines the student response to this early intervention and its impact on their performance in assessment.

Keywords: *assessment, engineering, students at risk, first year experience.*

Introduction

The first year of university study, especially the first six weeks, are recognised as crucial in setting the scene for student persistence and success (Kuh, 2007; Krause, Hartley, James, & McInnis, 2005; Pascarella and Terenzini, 2005). Some find adjustment extremely difficult and feel very isolated. In many cases students are so overwhelmed by the complexity of the university setting and the demands they face adjusting to their new studies and their complex lives that they find it difficult to focus on learning or assessment in the first few weeks (Krause, 2005).

Academic success is a powerful means of ensuring student engagement and persistence. Pascarella and Terenzini (2005) argue convincingly that good grades have 'a positive and statistically significant effect' on persistence in and past the first year, on degree completion and subsequent employment opportunities (p.397). They point to the work of DesJardins,

Ahlburg and McCall which show that while it is important to take a multi-dimensional approach to engaging students, ' … their success or lack of it, [is] integral to decisions about continuing, taking leave or withdrawing' (p.396). In Australia the Higher Education Census date in about week four of each semester marks a turning point for many local students, for after that date they incur fees. Their overall satisfaction with courses and success in early assessment can be critical in influencing them to continue rather than withdraw. An interesting curriculum and 'assessment designed to lead to worthwhile learning' are imperative (Gibbs and Simpson, 2004 – 05, p.3) but so too is their sense of being accepted and supported (Pascarella and Terenzini, 2005).

Focussing students' attention on their academic work at the start of their first year is not always easy. Recent school graduates are naturally very confident about both their ability and study methods. They can be both excited about commencing new programs yet unaware of what is required (Krause, 2005). Many, moving from more controlled high school systems to university, do not have guidance from family or friends with prior successful experiences in higher education. Although attendance is integral to academic success (Halpern, 2007), students commonly adopt counter productive early behaviours: skipping class, coming to class unprepared, or allocating too much time to paid work (Kuh, 2003 cited in Krause, 2005, Gibbs & Simpson, 2004 – 05). So at the very time they need to join with their new learning community, they are often distracted. Tailored intervention strategies that focus students on engaging with their courses, lecturers, peers, and their university are needed (Krause, 2005; Pascarella and Terenzini, 2005; Zimitat, & Sebastian, 2007).

In 2006 similar as well as specific campus-based concerns with student engagement, retention and success in certain programs prompted the Division of Information Technology, Engineering and the Environment (ITEE) at Mawson Lakes campus of the University of South Australia (UniSA) to establish a *First Year Experience Project* (FYE) (Smith, 2006). In this broadly-based project, one initiative was aimed at 'supporting students at risk' (SSAR). It focussed specifically on improving students' early academic performance in core first year courses. Through SSAR, student attendance, participation and success in assessment were fostered in a number of core first year courses. At the end of 2006 it was found that SSAR had contributed to FYE's overall success in achieving better retention and success, and improved student perceptions of satisfaction with university (Smith, 2006).

In 2008 SSAR was adopted as a key strategy for focussing students on academic engagement in the revised first year engineering program. This paper describes SSAR's implementation in the first half of 2008 in this program, explores its impact on students, and their assessment performance in the two target courses; Mathematical Methods for Engineers 1 (MME1) and Sustainable Engineering Practice (SEP).

Engineering at Mawson Lakes campus of UniSA

The new common first year engineering program replaced three separate first year curricula for students in the broad disciplines of Civil, Mechanical and Electrical Engineering. This development, a response to changed market conditions and industry needs for more engineering graduates, has broadened access to engineering at UniSA by accepting Associate degree students and those from alternative pathways. The projected intake was approximately 200 students. From the student perspective the revised curriculum includes more substantial elements of experiential learning through project- and problem-based learning in core courses such as SEP. It also fosters better communication and socialisation across engineering divides.

Mawson Lakes, home campus for engineering, is an outer-metropolitan campus adjacent to a new suburb. It is large with widely dispersed discipline specific buildings. Most students travel to and from campus daily and as there are limited local and on-campus opportunities to align students with their campus and program so the quality and depth of their socialistion and engagement with their learning in the early weeks of their first semester can be affected (Zimitat & Sebastian, 2007; Kuh 2007; Krause et al., 2005).

The new engineering program is supported by a First Year Coordinator, and a broadly-based team of staff teaching core courses and academic and student support staff from the Learning and Teaching Unit (LTU), and Library staff. This team meets regularly to review current curriculum, student learning and student engagement issues. The SSAR coordinator reports to team meetings.

The 'Supporting students at risk' strategy (SSAR)

SSAR's function is to alert commencing students that they need to participate fully in their coursework and assessment in order to pass and to provide encouragement and support. While driven by and for the division, it is collaborative involving divisional staff in two main disciplines (Engineering, and Computer and Information Science) with the learning advisers in the Learning and teaching Unit (LTU), one of whom is the SSAR coordinator. SSAR's implementation operates on minimal staffing: a learning adviser as coordinator, an hourly paid research assistant at crucial times and occasionally an additional learning adviser. As timelines are usually tight SSAR relies on a high level of staff cooperation and goodwill.

Once the target courses for each semester are nominated, SSAR (Figure 1) operates in two stages. The first stage (steps one to four) precedes the Higher Education Contribution Scheme Census date. Contact is made with all students who have poor attendance in the first few weeks and/or poor results in weekly quizzes. Whenever possible students are contacted by telephone and the focus is encouragement and support – this personal interaction is appreciated by students and known to be especially beneficial to first generation higher education students (Gibbs, 2005). Students are encouraged to understand that attendance and success in early assessment tasks contribute to final grades. The timing allows students with significant issues to review, and if appropriate, amend their enrolment without penalty. The second stage (steps five to nine) responds to assessment results after the first major assessment task which, driven by policy, has to be 'worth no more than 15% of the total assessment for the course …[and occur] in the first third of the study period' (UniSA, 2008, p. 3). Again students are provided with specific advice about available help and resources. At both stages emergent issues are reported to course coordinators. At the end of semester student results are collated. SSAR reports are available online on a *Share point* for ongoing course reviews.

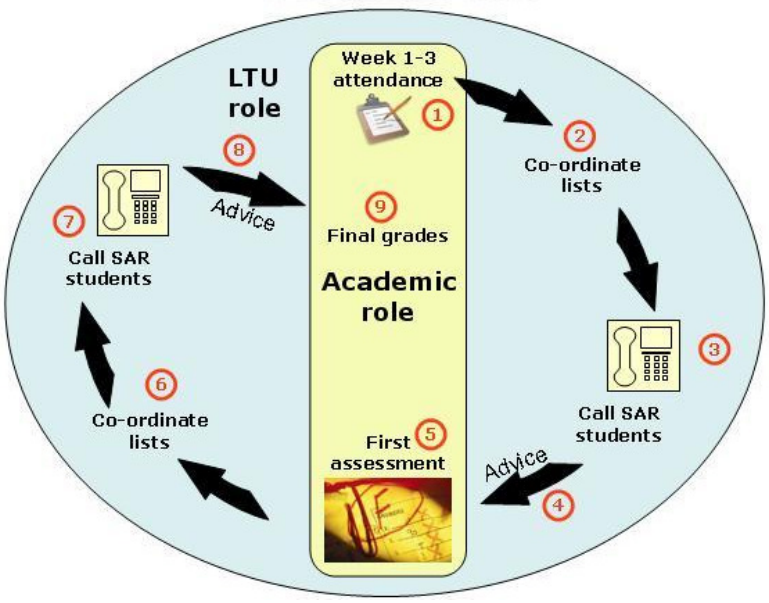

Figure 1: The SSAR process

The SSAR process relies on the development of accurate and inclusive lists of students who may be 'at risk' early in their first year of study. The course class lists provided by coordinators are generally inaccurate as they are based on early enrolment data. Consequently lists are modified to remove inactive students e.g. those who have withdrawn, before any attempt to contact students. All who are active in that first year course remain on the list including some who have enrolled in courses prior to the current year. The lists from different courses are also cross-referenced to identify students 'at risk' in more than one course to ensure no duplication in SSAR contacts. Once lists are finalised each student is contacted to check on their progress. At the end of each stage amended lists with student responses are returned to teaching staff. At the end of the semester the lists are reviewed again and grades entered to enable evaluation of the strategy.

Staff supporting SSAR aim to speak to all students identified as 'at risk' in target courses from Computer and Information Science (CIS) and Engineering, usually four to six courses per semester. Calls are made by experienced staff aware of the issues affecting students e.g. learning advisers. There is an agreed script designed to encourage and support students and elicit information about their concerns. If possible when phone contact fails, email messages are sent explaining the reason for contact and offering encouragement and course-specific support information. As the timeline for contacting students is generally short and staffing limited, students cannot be phoned repeatedly so success in phone contacts varies according to student availability.

SSAR in First year Engineering

A total of five of the new engineering courses were selected for implementation of the SSAR strategy in 2008: two in the first half of the year. MME1 was selected because engineering mathematics can be difficult for commencing students and, with a more diverse intake, staff were keen to monitor student progress closely. SEP was selected to monitor student engagement in this innovative professional practice course. The assessment schedule was quite different in each. In MME1 students had weekly quizzes from week one, a mid-semester assignment, one project, one computer test and a final examination but in SEP

assessment took the form of three written assignments. The first task, a report, was submitted in week four.

SSAR Stage one

SSAR contacts had to be completed before 31st March 2008. In late March course coordinators developed Stage one student lists based on the first three weeks of classes. The SEP list was based on attendance. In MME1 the lists took both attendance and underperformance in weekly quizzes into account. Lists were reviewed and active contactable enrolments identified (10 in SEP; 34 in MME1); these students were followed up.

In SEP, five students were contacted successfully by phone and further five followed up by email. In MME1, 31 were contacted and a further 3 left messages or sent emails. With each phone contact responses were noted (see Table 1). Revised class lists incorporating students' enrolment status and the SSAR outcomes were returned to course coordinators. In MME1 the course coordinator reiterated the availability of support through lectures and follow-up emails to students 'at risk'.

Most students were pleased to be contacted and willing to discuss their situation. They reported a range of concerns (see Table 1). Many especially those doing the quizzes in MME1 were concerned about their results. Those with specific concerns e.g. health issues or questions, were referred to course teaching staff, learning advisers, disability support, the Maths Help Centre or specific resources. Some, usually continuing students, were confident and unconcerned.

Table 1: Stage one student responses (both courses)

Responses	Total
Nominated concerns • struggling with content (13) • problem with time management or work (7) • specific health or family issues (5) • using Help Desk (1)	26
There's no problem • attendance list incorrect (8) • it's fine (4) • late enrolment (2) • credit granted (1)	15
Withdrawal likely • work /study clash (3) • not interested (1)	4

SSAR Stage two

Stage two lists for both courses were based on results: the first assessment in SEP and the first major assignment and weekly quizzes in MME1. Each Stage two list included some students also on Stage one lists (seven in SEP, 20 in MME1). In SEP seven were phoned and 28 in MME1. A further 14 MME1 students were contacted by email.

Student responses to Stage two calls are summarised in Table 2. Overall students seemed committed and self-aware: this time the majority were more specific about issues affecting their learning and their needs especially in MME1 where the main concern was their limited mathematics knowledge and need for additional help. They were referred to appropriate sources of support. Again some continuing students were unconcerned about their progress.

Table 2: Summary of Stage 2 student responses for both courses

Responses	Total
Nominated concerns • Content (10) • Time management (6) • Motivation (4) • Work (3) • Medical (2)	25
Accessing support • Teaching staff (6) • Maths Help Center (2)	8
There's no problem (5)	5
Withdrawal likely (2)	2

In all, 107 active students were identified for contact in MME1 and SEP in the first half of 2008. The majority (78) were in MME1.

Evaluating the impact of SSAR

Staff had two key questions relating to SSAR's effectiveness

- Did students contacted through SSAR achieve academic success?
- Did the successful students act on SSAR advice?

These questions were explored through a review of final grades and an informal telephone survey of successful first year students contacted through SSAR. The grades review focused on students contacted by phone where there was evidence of that contact in the list. This limited the review to phoned students because most students contacted indirectly did not respond to messages.

Grades Review

As a first step the final grades of those who were contacted and completed the course were tabulated simply by Pass /Fail and stage of contact. The summative data revealed that 11/14 SEP students passed. 20/76 MME1 students who completed the course students passed. These results suggested that SSAR was more effective in SEP than in MME1. This prompted a more detailed analysis of students and results by

- first enrolment, 2008 or previously– to see if SSAR was more effective with its designated target, new rather than continuing students
- stage of contact - to determine when the intervention was more or less effective.

Tables 3 and 4 reflect this more detailed categorisation of the data. Students are shown as 2008 or continuing and by point of contact: those on Stage 1 lists, those on both Stage 1 and 2 lists, and those on Stage 2 lists only.

Table 3 presents the results for SEP students. This reveals a high success rate for new students (11/12) contacted through SSAR regardless of the stage of contact. In contrast, both continuing students in SEP failed.

Table 3: Final grades for SEP students contacted in SP2, 2008

SEP (New in 2008 or continuing (Cont) students)						
Point of contact	**Stage 1 list**		**Stage 1 & 2 lists**		**Stage 2 list**	
Grades	**2008**	**Cont**	**2008**	**Cont**	**2008**	**Cont**
PASS	5	0	1	0	5	0
FAIL	0	2	0	0	1	0
Totals	**5**	**2**	**1**	**0**	**6**	**0**

Table 4 presents the Pass/Fail results for MME1 students completing the course but the outcomes are now more transparent. Most new students (9/13) contacted at Stage 1 passed. Most (16/18) contacted twice i.e. at each stage, failed. Most new (28/31) and continuing (6/10) students contacted at Stage 2 failed. This suggests that in MME1 the early contact was effective in supporting students but by Stage 2, at mid-semester, it was difficult for the majority of 'at risk'students to pass this course.

Table 4: Final grades for MME1 students contacted in SP2, 2008

MME1 (New in 2008 or continuing (Cont) students)						
Point of contact	**Stage 1 list**		**Stage 1 & 2 lists**		**Stage 2 list**	
Grades	**2008**	**Cont**	**2008**	**Cont**	**2008**	**Cont**
PASS	9	0	0	2	3	4
FAIL	4	4	7	9	28	6
Totals	**13**	**4**	**7**	**11**	**31**	**10**

Categorization of student results by '2008 and 'continuing' students has highlighted a student progress issue affecting both courses. Continuing students identified as 'at risk' were at grave risk and likely to fail. Further examination of their actual grades revealed that all 21 continuing MME1 students who failed scored <40 (F2), the lowest grade.

Post results survey

An unstructured telephone survey of successful commencing students enquired about their opinion of SSAR and any strategies they used to improve academically. Only 9/29 could be contacted in the given time. Although a small sample their responses supported existing anecdotal data that students valued being contacted and advised about learning and support resources. The majority (seven) thought SSAR was a good initiative and followed the SSAR advice. Two thought SSAR was alright but not necessary. Those who followed advice worked with teaching staff (two), friends (two), used recommended websites (one), or other strategies (one).

Discussion

At present the SSAR intervention needs to be considered as a work in progress: it is still evolving its approach and evaluation processes. Yet there are clear indications in the current data that it is an effective intervention especially for first year students.

Commencing students 'learn by being involved' (Krause, 2005, p.1). They also need early acceptance and academic success (Pascarella and Terenzini, 2005). One of the features of SSAR is that it provides personal contact when new students can feel isolated and anonymous. It focuses them on academic involvement, assessment and building their learning community (Tinto, 2001). Analysis of the results of students who completed the two target engineering courses supports the view that personal contact with new students in the first few weeks is valuable in focusing students on their learning. Current student feedback shows clear support for SSAR and confirms that successful students accept advice.

In the engineering program SSAR has supported teaching by providing more specific data about students, their progress and their concerns. Its embeddedness in the teaching program and the continuous availability of reports add to its effectiveness. Questions raised through the intervention are explored in team meetings, related to good teaching and relevant assessment practices and reinforced within courses (Gibbs & Simpson, 2004 - 05).

The review of SSAR results in both engineering courses has demonstrated that early contact can focus students on academic performance and assessment. It has also highlighted differences between courses, particularly in relation to teaching, learning and assessment. In SEP SSAR was effective at both stages. In MME1, where both attendance and completion of weekly tasks were crucial, early intervention was important. In this course students who were still under-performing at mid-semester tended to fail. SSAR has furnished clear evidence to the course coordinator about the student experience in MME1, especially the need for more learning support.

The collaboration that is integral to SSAR can prompt a review of student learning and assessment. The MME1 coordinator, interested in enhancing the screening process for Stage 1, explored the function of quizzes in identifying 'students at risk' and predicting final grades. Course-based analysis of results found that

- almost all students identified to be 'at-risk' in both stages had performed poorly in quizzes
- quiz results were more effective than the first major assessment (Assignment 1) in identifying 'students at risk'
- most students who addressed learning issues related to quiz performance passed
- students who were identified late had a poor success rate.

These findings substantiated the value of weekly quizzes as an assessment and learning tool in a course like MME1 (Gibbs & Simpson, 2004 - 05). They have prompted a new approach to managing under-prepared students which could increase student success in MME1. In the second half of 2008, under-prepared MME1 students have access to 'early brush-up classes'.

The detailed approach used to analyse results by both cohort and the stage of student contact highlighted a suspected issue among continuing students. Here many continuing students presented early as 'at risk', felt confident about their learning competency, but were at severe risk. SSAR in its present form has minimal impact on these students but their failure in MME1 and other courses is an undesirable outcome for the individuals, courses and the program. The teaching team will need to investigate this group further and consider how to support them. The method of data analysis adopted here can now be used across target courses to analyse the impact of SSAR.

SSAR can demonstrate its value in programs like engineering where there is a transparent interconnection between classroom teaching, assessment and attendance. Halpern's recent

study (2007) argues that attendance is associated strongly with commitment and ability, and all factors affect outcomes. These links underpin this intervention. Engineering programs with their relatively high contact hours and a heavy workload attract many committed, strategic students following a long-term goal (Krause, 2006). SSAR, in providing personal recognition, encouragement and explicit information about what students can do to succeed, is useful in combating early isolation and the many distractions of the early weeks.

Conclusion

SSAR focusses students' attention on their coursework and assessment. When SSAR is implemented in the first semester of study and closely aligned to the teaching program, it augments the role of teaching staff in fostering academic engagement, participation and success. At Mawson Lakes SSAR is a team effort involving disciplinary and learning development staff working together on improving success rates among commencing students. It is an approach that can offer fresh insights into the management and support of students in core first year courses.

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