

# The development of a structured “Peer Assisted Study Program” with required attendance

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*Peer Assisted Study Sessions (PASS) are a variation of peer education specifically designed to enhance first year university students in courses that have an historically high failure or withdrawal rate. Traditionally, attendance at PASS has been voluntary and activities are generated by PASS leaders (second or third year undergraduate students). At Flinders University, PASS has been remodelled with the voluntary aspect removed and replaced with an attendance grade of 5%. In addition, structure has been developed in the program by providing educationally tested materials alleviating the need for leaders to design their own activities. This has led to standardisation of sessions, a reduction of stress for leaders and has ensured that activities focus on Threshold Concepts. The introduction of PASS into a first year biology course has had dramatic effects with respect to decreased failure and withdrawal rate (especially of male students) and not surprisingly, attendance is very high (85%).*

## Introduction

Peer education is far from being a new idea with as diverse an array of models as there are universities running them. Motivations for implementing such programs range from improving or centralising academic support for general students, or special populations; to counselling and health promotion (Falchikov, 2001). Arendale (2001) highlights that most peer learning programs (such as Supplemental Instruction, Peer Assisted Learning - PAL and Peer Assisted Study Sessions) are based on a model developed in 1973, at the University of Missouri-Kansas City. In fact, the circumstances that led to the development of the American model closely mirror the current situation facing many Australian universities and thus put Australia in a good position to reap the benefits of past and present research. Currently, there are at least twelve Australian institutions that have already put into effect models of peer education to improve student grades (pers. obs), retention and transition, (Miller, Oldfield, & Bulmer, 2004) as well many studies in the United States and around the world.

Dixon and Gudan (2000) found that students who attended peer-assisted learning programs had significantly higher success rates than those who did not attend. Its effectiveness is claimed to be based on the premise that students will take a more active and engaged role in their studies (Xu, Hartman, Ubribe and Mencke, 2001); that the types of activities involved require high-level cognition (Topping, 1996; King, Staffieri, & Adalgais, 1998); and relevant social interaction (Luca & Clarkson, 2002). PASS is known to assist students in maximising their ability to organise and use study materials, as well as clarify assessment tasks and requirements of the course. Contextual activities encourage students to discuss their learning in an informal atmosphere with their peers. PASS encourages student participation and

further equips students with the tools to become excellent problem solvers. Within PASS students work together, with guidance from PASS leaders, to clarify misunderstandings of course content, to review material, and gain useful insight and information from other students to assist their studies.

In a practical sense, PASS is effective because peer leaders are well accepted, are seen as positive role models, and are a preferred source of course-specific information (Badura, Millard, Peluso, & Ortman, 2000; Grudens-Schuck, Cramer, Exner, & Shour, 2003). Peer leaders use cues and prompts that may lower anxiety and increase ownership of learning (Topping, 1996). In addition, because they are seen as 'one of us', they are perceived as more empathetic and interested in students' lives than academics might be (Topping, 1996). Peer leaders' use of language is more familiar to undergraduate students, effectively translating between academics and students and reducing the distance most students perceive between themselves and academic staff. In addition, they may be more familiar with where knowledge deficits stem from, and which learning techniques today's students prefer, making them a valuable tool for reducing the demands on academic staff (Grudens-Schuck et al., 2003). However, peer leaders generally do not have an educational background nor are they necessarily aware of the specific concepts that struggling students frequently encounter (pers. obs.). A system where peer leaders are expected to predict problems and organise study materials for first year students requires considerable time investment and some understanding of student learning. PASS traditionally relies on leaders independently deciding on activities to be implemented in their own sessions, which has the potential to produce both inconsistencies as well as inefficiencies within PASS and could result in low quality learning activities, or activities that miss the mark.

Luca and Clarkson (2002) found that peer groups were inconsistent and that some groups had a lack of awareness of the role of peer leaders. King, Staffieri and Adelgais (1998) found that where mutual peer tutoring was relatively unstructured, there were low levels of cognitive gain. Clearly, some additional support structure within PASS could not only enhance the educational output but also relieve pressure felt by leaders to generate appropriate learning materials based on an educationally valid premise. The potential benefits to student learning could also increase and be somewhat more standardized across sessions without necessarily removing the informal, personal aspect or spontaneity generated by having different PASS leaders. Goodlad (1999) provides a very useful framework for design and implementation of peer tutoring. Most of the points he makes are clear and tend to be adhered to within PASS, such as; defined aims of scheme, roles and responsibilities in scheme, train tutors, keep logistics simple and evaluate scheme. What PASS does not clearly follow is his rules relating to structure, that is, provide well-structured materials, and meaningful tasks. Although some leaders might be able to produce activities which are both well structured and meaningful they might not be addressing the most critical aspect of student misunderstanding, that is, Threshold Concepts, (Land, Meyer and Smith 2008) nor will the sessions be of equal value.

There has been worldwide recognition that PASS works well in high-risk subjects, such as natural and health sciences, statistics, mathematics, business and the professions (Dobbie, 2008; Beasley, 1997; Couchman, 1997; Coe, McDougall, & McKeown, 1999) where it has been seen to increase student participation and grades, while lowering attrition rates. At the University of Queensland, students attending PASS regularly score significantly higher grades, in addition to having a lower failure rate (Miller et al. 2004). However, overall attendance in these voluntary programs is not always maximal. For example, a study at the University of Manchester, described 50% attendance in a voluntary program as being high (Coe et al., 1999) and other studies found that voluntary attendance was as low as 10%

(Packham & Miller, 2000). Packham and Miller (2000) also found that PASS sessions are female dominated and that, in general, female students tend to visit sessions at a far higher rate than do male students. Voluntary programs therefore may not be attracting the students who could benefit most from a program of this nature. Attendance has been found to strongly correlate with performance across many different disciplines (Devadoss & Foltz, 1996; Durden & Ellis, 1995; Park & Kerr, 1990; Marburger, 2001) where voluntary programs have been shown to have substantial influence on transition, students who do not attend would be at a clear disadvantage.

Student diversity and the range of study approaches mixed with full or part time work and outside responsibilities have become increasingly complicated in modern day tertiary students (Abbott-Chapman & Edwards, 1998; Krause, Hartley, James, & McInnis, 2005; Kennedy, Judd, Churchward, Gray, & Krause, 2008; Huijser, 2008). Tinto (1993), states that over half of the students who start university do not complete a degree program. Universities offer many services to support students both academically and personally, yet many of these are underutilised by students as they are too time poor (Huijser, 2008). Embedding programs such as PASS within courses (rather than as an additional service), ensures that a greater number of students will encounter this valuable support.

Logistically, with increasing numbers of students in first year courses, there is pressure on teaching staff to provide enough feedback on learning and assessment pieces. Peer leaders can provide immediate feedback (Topping, 1996), and therefore activities undertaken in peer assisted study sessions can be an important formative assessment component. In addition, the smaller ratio of students to leaders allows more individualised attention and time on task (Topping, 1996) without the pressure of an assessment component. Clearly, peer led study sessions can be an excellent tool, however our study looks to whether the traditional approach can be improved upon. The question we address in this paper is “By providing structure and implementing an attendance incentive, will students be more likely to gain better understanding of difficult course concepts and will they be more likely to attend?”

## **Background Information**

Biology is a subject that students traditionally find difficult, primarily due to its content heavy workload and difficult concepts. First Year Biology at Flinders University consists of approximately 600 students, half of which do not have a year 12 biology background. Students in the course are enrolled in 36 different degree programs (for some it is mandatory, for others it is an elective).

The rapidly expanding research scope in the field of biology requires students to have a strong grounding in the basics to be successful in subsequent Biology courses. Prior to the commencement of PASS in the two core first year biology topics (BIOL1102; Molecular Basis of Life: and BIOL1101; Evolution of Biological Diversity), attrition rates from 2001 to 2005 were as high as 21% and the failure rate was on average 25%. During this time male students failed significantly more often than females (28% compared to 14%) and mature age students failed significantly more often than school leavers 26% compared to 11% (for complete data set see Burke da Silva, Hunter and Auburn, 2008).

In 2006, we introduced PASS as a means to attempt to decrease the negative effects of transition, such as student withdrawal and failure within first year Biology. Drop-in style study sessions had been trialled within the Faculty of Science and Engineering at Flinders University previously but were discontinued due to lack of student interest and attendance.

Our main objectives when introducing PASS at Flinders were to:

- Help students without year 12 background to achieve higher grades;
- Extend high achieving students by giving them opportunities to 'teach' others;
- Make for a smoother transition, with a view to reducing the withdrawal rate;
- Increase academic understanding of material and awareness of how biology fits into the real world; and
- Make the program more engaging so that students would want to continue taking biology into the future.

## **PASS at Flinders**

The relaxed environment of PASS enables students to seek help from their leaders without the anxiety associated with approaching academics. Sessions can contain up to 30 first year students and 2 PASS leaders, who have received high distinction grades in the course previously. Most importantly, PASS leaders are not teachers so they do not provide students with the answers to problems. Leaders guide students towards discovering the answer themselves, which from an educational perspective is much more rewarding, and thus likely to remain embedded within the students understanding.

We modeled PASS after the University of Queensland program with the help of Dr. Valda Miller (U.Q. PASS Coordinator). Our program however, differs from traditional PASS in a few important details. PASS at Flinders was designed to be semi-structured, so that at least half of the session followed a developed exercise that had been put together by the Course Coordinator. The other major differences of the Flinders PASS programme are that:

- We assigned a 5% attendance grade on PASS.
- PASS leaders are provided with an organized activity to direct learning in a specific area of known difficulty which takes up at least half of the time allotted. The aim of this being to reduce stress of leaders and create sessions that are more balanced.

## **Results**

In the three years since introducing PASS, sessions have been attended well, averaging 85%. Student feedback has been overwhelmingly positive from both PASS leaders and participants.

In 2006, 333 students completed surveys regarding their perception of the benefits gained from PASS attendance (See Table 1).

A summary of the long-term effects influencing the final outcome statistics for the first year courses since changes were implemented can be found in Table 2. A remarkable change, that we believe is primarily due to the implementation of PASS, is the reduction in failure rates of students that have not studied year 12 Biology. Prior to the introduction of PASS these students failed at a rate of 25% compared to 11% respectively. This gap has now not only closed so that it is no longer significantly different to the proportion of students that have previously studied biology in year 12, but the overall failure rate has reduced from 25% to 11%. A similarly concerning difference in overall statistics existed between genders, with males failing the topic at 28% compared to females at 14%. Overall failure rate has dropped for both groups of students but the difference in failure rate is what has clearly changed after the introduction of PASS, with males now failing at 16% and females at 10%. A testament to the satisfaction with the outcome of their first year biology experience is the massive

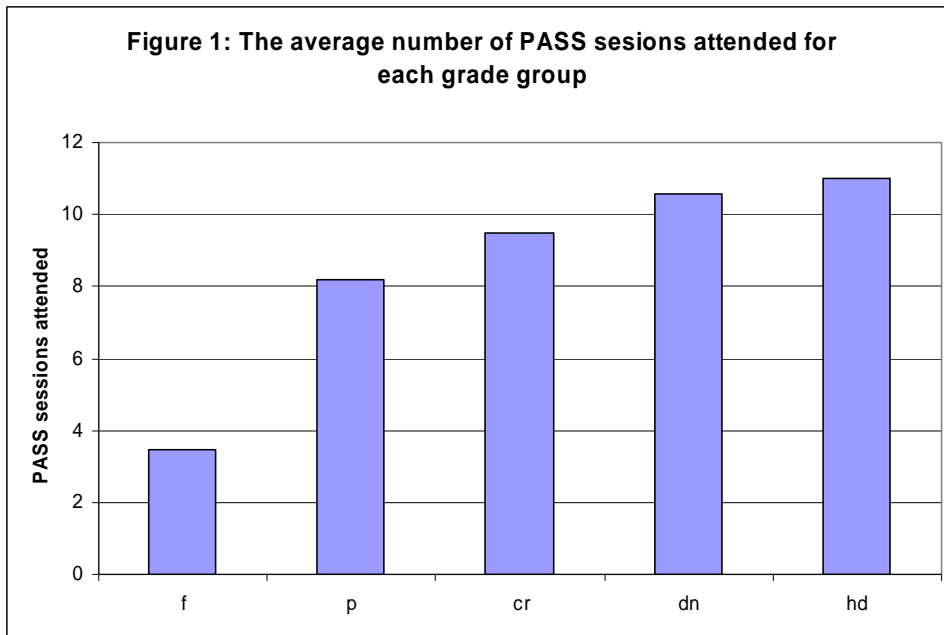
reduction in withdrawals from the course from 21% to 7%. Improved failure rates and student satisfaction, pleasingly, are not the only rewards from the introduction of PASS, the overall grades for the course have shown an increase with the number of PASS sessions attended in a semester, as is evident in figure 1 (below).

**Table 1: Summary of student evaluation surveys showing the percentage of students that responded ‘yes’ to questions regarding specific outcomes of the PASS programme in first year biology topics at Flinders University.**

<b>Outcome</b>	<b>Percentage of students that responded ‘yes’ to survey items</b>
Made new friends	72
Formation of informal additional study groups	46
Belief that a better final grade was achieved due to PASS attendance <i>regardless</i> of attendance grade	65
Non-attendance without 5% attendance grade incentive	50
No perceived academic benefit (except making friends and socialising [transition]).	10

**Table 2: Summary of final outcome statistics for first year Biology showing change in percentages of students failing, withdrawing; and continuing within School of Biology courses.**

<b>Outcome</b>	<b>Changes to enrolment statistics (%)</b>
Reduction in withdrawals from the topic	66
Reduction in students failing topic	56
Reduction in difference in failure rates of students without year 12 biology compared to those with	57
Increase in proportion of male students passing topic	16
Increase Second year enrolment in Biology topics increased	21



## Discussion

The use of peer-assisted study programs is increasing throughout Australian universities because of increasing teaching pressures (O'Donnell, 2004). O'Donnell (2004) also stresses that these pressures stem from factors such as increasing student intakes, increased numbers of international students and reduced government funding. A major issue of increasing student diversity is that many students are now lacking traditional entry skills for academic success. Interestingly, Born, William and Pinto (2002) have shown that remedial programs do not necessarily have the desired effect of building student knowledge and confidence. The use of peer leaders is a way to provide smaller class sizes and greater individual support to students without being remedial. Peer learning can be very cost-effective since it frees academic staff from time consuming tutorials. In addition, there is a growing body, of qualitative and quantitative evidence, that peer study schemes enhance learning, and develop employer valued communication and interpersonal skills for both the students and the leaders (Topping, 1996; Fuchs & Fuchs, 1997). An obvious benefit to the student is the ability to 'engage' with the course material outside of the lecture with assistance from their peers who have the ability to lead discovery at appropriate levels. It is in this environment that students are able to admit unawareness and misunderstanding of course content, and seek information, advice and remediation, without fear of jeopardising their academic outcome (Bulmer & Miller, 2003).

Wright (2003) conducted an ethnographic study of voluntary PASS schemes showing a disproportionate number of female students were found attending PASS. Briefly, the author found non-users of a maths tutoring service used 'self-handicapping excuses' such as being lazy, stubborn or too proud as reasons for not attending. Male facilitators tended to use similar explanations for the non-attending students and attributed higher female attendance to a belief that females found maths more difficult than males. The facilitators also recognised that females are more willing to ask for help than male participants. This observation is supported by Tannen (as cited in Wright, 2003) who found that men question less in public situations if it reveals a lack of knowledge. If they are less likely to take advantage of a voluntary tutorial system, then adding an assessment component to the session will not only increase their attendance but also will increase their understanding of course material and have the follow

on effect of decreasing failure rate. It is clear that implementing a 5% assessment component onto PASS has significantly increased attendance resulting in a decrease in failure rate. Removing the voluntary aspect of PASS has prevented males avoiding what might be considered remedial work and resulting in a decrease in male failure rate; a huge success of this program.

The literature also provides evidence of the transitional benefits that first year students gain through the social environment and resulting networks created by peer study. The combination of these transitional benefits to students, and the demonstrated academic improvements were the motivation for the specific changes introduced to PASS, within the School of Biological Sciences at Flinders University. In addition, the outcomes are in accordance with the financial rationale of PASS as the interests of the university can be achieved with the additional benefits to learning outcomes and student transition of enrolled students, essentially by decreasing attrition and failure rates. Embedding a 5% attendance grade also ensures greater value for money as all PASS sessions run with full student loads, rather than some sessions not being attended and leaders still requiring payment.

Maintaining close academic affiliation to the course is also important for attendance so that students can see the value of attending PASS. Multiple authors (see for example Saunders & Gibbon, 1998; Packam & Miller, 2000) have found that sessions dealing with content that is seen to be of high academic value can greatly influence attendance patterns. Thus, providing activities that are of known educational value will further promote attendance and ensure that all sessions are of similar worth.

Creating specific activities for PASS leaders has also alleviated stress with respect to planning a session that may or may not be of importance to students. Student feedback is positive about the planned activities and there is no complaining or comparing between sessions. Students see the value of the activities and how it applies to course material, and although activities may be fun they are still considered worthwhile.

The aim of PASS within Flinders University was and is to create a mutual learning environment where students are able to fuse the learning that they have gained from lectures into a more thorough understanding of concepts by creating student centred discussions in a relaxed yet intellectually stimulating environment. Smaller classes allow a different approach to learning that can be highly engaging and academically enhancing for both students and peer leaders, particularly when activities are not only at the appropriate level but also target specific known problems and critical Threshold Concepts. A highly successful relationship between student and leader is more likely to occur if they have been well prepared, and are well supported by academics involved in the courses. The success of PASS within the School of Biological Sciences at Flinders University is a result of clear and careful planning with the main goal being to create an environment where first year students gain a better academic understanding of course material and help with transition to university. The results we have gained through reduced failure and attrition rates clearly show that the program has been highly successful in this regard.

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