RFP-006: Student Services

The Effectiveness of the Peer-Assisted Study Sessions (PASS) Program in Enhancing Student Academic Success at Carleton University

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The Higher Education Quality Council of Ontario (HEQCO) issued a Request for Proposals in June 2008 that focused on The Role of Student Services in Support of Access, Retention and Quality. The goal was to provide funding to institutions to allow them to evaluate the effectiveness of existing student services projects or programs designed to enhance student access, retention and academic success, and to identify best practices and innovative techniques that might be useful for other postsecondary institutions. Twenty-eight proposals from Ontario colleges and universities were submitted, and 15 projects were subsequently approved for funding by HEQCO.

While there was some overlap, the projects were roughly divided into those that focused on the general student population to deal with overall first-year transition challenges; those that focused on improving the engagement, transition and retention of targeted populations of “at-risk” students; and those that focused on courses and programs that were considered to be “at-risk” (e.g. high rates of Failure and Withdrawal) for students enrolled.

This final report is part of the “Student Services” series, and is one of four being released in June 2010. Together, these and the subsequent reports from this series will help better inform student success strategies with evidence-based assessments.

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Executive Summary

Throughout North America and in several countries worldwide, peer-assisted study sessions (PASS) programs and other, similar forms of student-led supplemental instruction have become increasingly popular in postsecondary education as institutions aim to increase student retention, improve students' grades and enhance learning quality. However, there is a paucity of data concerning the effectiveness of such programs in helping Canadian universities and colleges reach goals such as these. Moreover, the potential benefits of the PASS program to facilitators and faculty members have, for the most part, gone unexplored.

To this end, a research study was conducted with the financial support of the Higher Education Quality Council of Ontario (HEQCO). It had three overarching goals:

- To ascertain whether PASS significantly improved student academic success (i.e., quantitative analyses) and to corroborate these findings with subjective student-participant impressions of the PASS program (i.e., qualitative analyses);
- To evaluate the influence of PASS on qualitative measures of facilitators' academic and career development; and
- To determine faculty reaction to and acceptance of Carleton's PASS program as currently implemented, as well as discerning faculty reaction to and acceptance of peer-assisted learning practices in general (The Higher Education Quality Council of Ontario, 2007).

The PASS program was first piloted at Carleton University in 2000, when support was provided through the Centre for Initiatives in Education (CIE) for one first-year psychology course. Currently administered by the Student Academic Success Centre (SASC), Carleton's PASS program has expanded greatly since 2000, with PASS support being provided for over 50 courses in a number of different faculties. As with most types of supplemental instruction, the PASS program at Carleton University is a peer-led form of academic assistance for students registered in traditionally difficult or high-attrition courses, with combined D, Fail or Withdrawal (DFW) rates in excess of 30 per cent.

According to observations made in the present investigation, PASS significantly improved student academic success at Carleton University during the two academic years for which data was collected (2006/07 and 2007/08). Specifically, students who attended PASS achieved higher final course grades, on average, than students who did not attend PASS, and this effect varied as a function of the number of PASS sessions/hours attended. Moreover, the beneficial effect of PASS on final course grades remained significant even after the influence of prior academic performance (i.e., overall admission average of PASS participants and non-participants alike) was controlled for using correlational methods and analysis of covariance. Likewise, in most courses surveyed across both academic years (45 of the 53 PASS-supported courses during that span), the D, Fail or Withdrawal (DFW) rates were significantly lower among

PASS participants than was the case for non-participants, and again, the higher the attendance, the lower the DFW rates tended to be.

Findings from the qualitative analysis of students' survey responses indicate that students generally perceive PASS as offering many benefits, including higher course grades and better understanding of the course content, as well as increased self-confidence and social support. However, student turnout to PASS workshops has been relatively poor, and students who did not attend PASS indicated that they often had a class or outside conflict (e.g., job, family, illness) that made attending the workshops untenable. Interestingly, PASS facilitators reported many benefits to themselves, including improved leadership skills and mastery of course content, enhanced communication skills and increased motivation to attend graduate or professional school. Perhaps not surprisingly, facilitators also reported benefits to their professional development.

Present findings also suggest that a majority of faculty members believe that PASS sessions are beneficial to students who choose to participate. However, faculty members tended to indicate that low student attendance at PASS sessions was a significant problem. Faculty also identified other challenges facing Carleton's PASS program, such as limited resources (i.e., an insufficient number of PASS-supported courses or too few PASS workshops), a lack of faculty awareness and knowledge of the program and a perception among at least some faculty members that instructors/faculty do not have enough control over what transpires in the PASS workshops (i.e., which aspects of the course content are emphasized).

Thus, it appears that Carleton's PASS program is indeed effective in enhancing student academic success *for those students who attend the PASS workshops*. Accordingly, recommendations are made regarding the necessity of comprehensive efforts to increase student attendance at PASS workshops, and it is suggested that further research is warranted to ascertain the most appropriate ways of attaining this goal – as indicated by students, facilitators and faculty.

I. Introduction

It is widely recognized that postsecondary education must place student engagement and student success at the centre of its focus within a culture of lifelong learning and development (UNESCO, 2002). Investing in students through support services and supplemental programs is expected to increase students' success (i.e., grades achieved, retention and graduation rates, student engagement and satisfaction, etc.) and their contribution to the national economies when they enter the workforce (ibid.). The drive to improve student retention, satisfaction and engagement in the learning process has promoted keen interest in the role of student services and programs in higher education (Scott, Shah, Grebennikov, & Singh, 2008). To this end, many educational institutions within Canada and around the world have introduced peer-assisted learning programs, in one form or another, as integral parts of their service portfolios. The theoretical underpinnings of these programs lie in widely accepted pedagogical approaches that emphasize collaborative, social constructivist and student-centred learning activities (Arendale, 1996), with the overarching goals of increasing student retention, improving students' grades and enhancing learning quality and students' engagement in the learning process (Weber State University, 2009).

A variety of peer-assisted learning programs, operating under several different names and differing slightly with regard to operational issues, have been successfully implemented within numerous institutions across North America and in several countries worldwide (e.g., South Africa, Australia, Mexico and Europe). In Canada, the most common names for these programs are the Peer Assisted Study Sessions (PASS) program, the Peer-Assisted Learning (PAL) project and the Supplemental Instruction (SI) program. All of these variants, including Carleton University's PASS program, can ultimately trace their origins to the SI model that was originally developed at the University of Missouri – Kansas City (UMKC) in 1973, with the goal of decreasing attrition rates among health science students (Weber State University, 2009).

Common to all the variants of the SI model is the fact that high-risk/traditionally difficult courses, rather than high-risk or at-risk students, are designated for support; that is, PASS (or PAL/SI) is a non-remedial approach to improving student learning outcomes. As such, all students (both remedial and non-remedial) enrolled in PASS- /PAL- /SI-supported courses are welcome to attend and participate in the peer-led sessions (Whitman, 1988). Importantly, but perhaps not surprisingly, the benefits of PASS are thought to extend beyond those experienced by student-participants, as faculty, student facilitators and institutions alike were either shown or theorized to also have reaped substantial rewards when PASS (or any derivation of SI) was implemented successfully (Capstick & Fleming, 2001; Capstick, Aisthorpe, Fleming, Haynes, & Spiers, 2002; Packham & Miller, 2000).

A Brief Literature Review

Supplemental Instruction (SI)/PASS/PAL has been in existence in the United States since the 1970s, so it is not surprising that the majority of research on the effectiveness of the program has been conducted by American scholars. Some of the best-known longitudinal studies have

been done at the International Center for Supplemental Instruction at the University of Missouri – Kansas City (UMKC), which not only continually monitors the outcomes of the program at the UMKC, but also collects and analyzes data from other U.S. institutions. David Arendale (1996) conducted one of the first such studies. It examined the UMKC data for the period 1980/81 to 1995/96 and included 14,667 students participating in the SI program. The analysis showed that students who participated in the program achieved significantly higher final grades (with a reported 54 per cent of participants achieving A and B grades, compared to 43 per cent of non-participants) and had a lower percentage of D and F grades and withdrawal rates.

In the same study, Arendale also reported findings from 270 other U.S. colleges and universities, which were similar to those drawn from the UMKC research. These data included almost 5,000 separate studies of SI concerning a total of 505,738 students. The most recent data set from the UMKC covers the period 2003-2006 and relates to 61,868 students taking 1,003 courses at 37 colleges and universities. Like the 1996 study, these comprehensive analyses, which accounted for the majority of the students' profiles (e.g., previous levels of academic achievement, standardized test scores, ethnicity and motivation level), showed improvement in the final grades of SI participants, as well as significantly lower DFW rates (on average 15 per cent lower than for non-SI participants).

In the United Kingdom, the SI program is usually known as Peer Assisted Learning (PAL), and since the early 1990s, it has been established at a number of higher-education institutions (Capstick, 2004). Research in the U.K. was reported by many authors (see Capstick, 2004; Capstick & Fleming, 2001; Coe, McDougall, & McKeown, 1999), and their findings were very similar to those resulting from research in the United States. For example, when the department of chemistry at the University of Manchester introduced PAL in 1995, the failure rate in the first-year course decreased from 20 per cent to 10 per cent, while the mean examination results were significantly higher for PAL participants. (For students who had participated in one to five sessions, the mean exam results were 51.9, while for non-participants, they were 47.3, and the mean exam results were 60.7 per cent for PAL participants who had attended more than five sessions (Coe, McDougall, & McKeown, , 1999). Other studies reported improved performance of PAL students, as well as reductions in dropout rates, coupled with enhanced communication and other transferable skills (Capstick, 2004).

Many Australian colleges and universities introduced SI programs under the name of Peer Assisted Study Sessions (PASS). In 2005, the University of Wollongong (UWO) became the National Centre for PASS in Australia. This institution collects and evaluates PASS data at the end of each academic year. The most recent available analyses (for 2008) grouped students according to the number of sessions attended throughout the semester and found that students attending PASS regularly scored significantly higher grades generally, in addition to having a lower failure rate (University of Wollongong, 2009). Miller, Oldfield, & Bulmer (2004) reported the results from the University of Queensland, according to which PASS attendees regularly scored significantly higher grades than did non-attendees. An interesting attempt to remodel the PASS program has been made at Australia's Flinders University (Burke da Silva & Auburn, 2009). The program's voluntary aspect has been replaced with an attendance grade of 5 per cent, and in addition, all material for workshop sessions has been developed by educational experts instead of PASS facilitators (ibid.). Burke da Silva & Auburn, (2009) reported very

positive feedback from students and PASS facilitators, as well as a decrease in the overall failure rate (from 25 per cent to 11 per cent).

The PASS program in Canada has been under-researched, and to the best of our knowledge, there is only one published study on the program – by Fayowski and MacMillan (2008). Here the authors examined the SI/PASS program in a first-year calculus course at the University of British Columbia by comparing final grades within three groups of students: 269 first-year math students who attended PASS sessions, 600 non-participants, and 390 students enrolled in the same course from a year prior to PASS implementation. The study concluded that the SI/PASS program could be "credited with a two-letter grade increase" (p. 4) for SI/PASS attendees after controlling for selection bias and gender differences. The study did not find gender differences of any significance and concluded that the PASS/SI participants had 2.7 times greater odds of success.

The PASS Program at Carleton University

Carleton University: General Background

Founded in 1942, Carleton University is a dynamic, research- and teaching-intensive institution located in Canada's capital. With a campus surrounded by the Rideau River, the historic Rideau Canal and fine residential neighborhoods, the university is a national leader in the study of public affairs and management, journalism, international affairs and high technology. Carleton also offers 65 outstanding undergraduate and graduate-level programs in the major disciplines of the arts and social sciences, science, business, and engineering and design. With almost 24,000 full- and part-time students from all over Canada and around the world, over 800 full-time faculty members, 1,200 contract instructors and over 1,000 staff members, the university offers a vibrant learning environment, with close ties to the region's business, cultural, government and high-technology communities. At Carleton, students are everyone's priority, and the university is committed to promoting a culture of student success both inside and outside the classroom. Carleton University offers a wide range of excellent services and initiatives designed to meet students' academic needs, including the Peer-Assisted Study Sessions program – a network of peers helping peers, with goals of increasing students' engagement and ownership of learning and enhancing students' academic achievements.

The Carleton PASS Program

The PASS program at Carleton University is a peer-led form of academic assistance for students registered in traditionally difficult or high-attrition courses (or sometimes for students registered in large classes that are degree prerequisites). Specifically, PASS support is offered for courses with combined D, Fail or Withdrawal (DFW) rates in excess of 30 per cent. Carleton's PASS program was initially piloted by the Centre for Initiatives in Education (CIE) and is currently administered by Carleton's Student Academic Success Centre (SASC). The goals of the PASS program at Carleton University – and of all SI-derived programs are to:

1. Reduce rates of attrition within targeted courses that are historically difficult (i.e., courses with DFW rates > 30 per cent);

2. improve student grades in these courses; and

3. enhance student academic success such that graduation rates among students are increased.

As with all variants of the SI model, Carleton's PASS program offers students an opportunity to come together in a non-threatening and informal environment, where they are encouraged to compare class notes, discuss important course concepts, develop strategies for studying and learning the course material and predict test items. Accordingly, students learn how to integrate course content and develop study skills in collaboration with their peers. In other words, PASS helps students to integrate process (i.e., "how to learn") with content (i.e., "what to learn"). The regularly scheduled (typically twice-a-week) sessions are led by PASS facilitators, themselves undergraduate students who have previously taken and excelled in the course for which they are providing support. Facilitators, aside from having excelled in the specific PASS-supported course to which they've been assigned, are subject to a fairly rigorous selection process, which emphasizes, among other things, strong communication skills and leadership abilities, as well as demonstrated scholastic aptitude (an overall CGPA of 9.0 or higher on a 12.0 scale or a grade of A- or higher in the selected course).

The PASS facilitators attend all class lectures, take detailed class notes and, generally speaking, strive to act as model students. All facilitators take part in approximately 40 hours of pre-service (at the beginning of the academic year) and in-service (throughout the term) PASS training delivered by the program coordinator and facilitator team leaders, who are themselves experienced PASS facilitators. This training is designed to educate and immerse prospective facilitators in the constructivist and collaborative learning principles in which the PASS program is rooted and to help facilitators adapt these learning principles to the classroom setting. For instance, appropriate student-facilitator communications are modelled extensively by the program coordinator and facilitator team leaders during the training sessions. In addition, PASS facilitators are taught how to develop effective, course-specific learning rubrics, matrices and worksheets. In sum, the PASS facilitators are "near-peers" who have received rather extensive training in collaborative learning techniques and relevant learning theory (Weber State University, 2009). It is important to underscore that PASS facilitators do not lecture or introduce new material; they are not surrogate instructors or professors. Rather, facilitators design and implement study activities aimed at helping students engage with the course content (and their peers) in a meaningful and enjoyable way.

At Carleton University, the PASS program functions as a complementary service for students enrolled in a PASS-supported course or section (although students in non–PASS-supported courses/sections may also choose to attend). While all students are encouraged to participate in PASS workshops, attendance is both voluntary and anonymous; however, facilitators do track attendance numbers for administrative purposes. At Carleton University, and indeed at other institutions offering similar programs, the experience has been that students with varying levels of academic preparedness and diverse ethnicities choose to participate in the PASS program (e.g., Weber State University, 2009).

PASS was first piloted at Carleton University in 2000, with one first-year psychology course. Thereafter, with increasing institutional support and student and faculty awareness, the program has grown substantially. In 2007/08 (the last calendar year for which data are currently available), the PASS program supported 46 different sections of 30 courses and 2,371 (out of 10,971) students in high-risk courses from several disciplines. Specifically, PASS supported 6.0 credits in the faculty of arts and social sciences, 12.0 credits in public affairs and management, 1.0 credit in the faculty of science and 0.5 credits in the faculty of engineering. As will be discussed later in some detail, barriers to student participation in PASS have long been recognized; yet it is encouraging that in every year for which data are available, between 22 per cent and 27 per cent of students enrolled in PASS-supported courses chose to participate in the program.

Research Goals of the Study

Fundamental to any profession are the capacity and willingness to objectively assess and evaluate programs and service delivery (UNESCO, 2002). Yet, as was discussed in the review of the available literature, while peer-assisted learning programs have been the subject of extensive research in the U.S.A., Australia and the U.K., very little empirical research has been undertaken to evaluate similar programs in Canadian tertiary education. Another issue related to the current research on peer-assisted learning programs, especially in the Canadian context, is that it tends to emphasize only quantitative outcomes of the programs and rarely addresses the wealth of readily available qualitative information (Capstick, 2004). As suggested by Capstick (2004), this may be the result of institutional pressure (e.g., financial) to demonstrate the clear benefits of SI/PASS/PAL programs.

Moreover, for many years, researchers have discussed the benefits of peer-assisted programs as they relate solely to students who attend the sessions. Only recently have some scholars begun to examine the benefits of the PASS program to the people who serve as facilitators and who are themselves students (e.g., Green, 2007; Stout & McDaniel, 2006). Similarly, there is a lack of data and reasoned analysis regarding the potential benefits of the PASS program to participating faculty members and institutions, and again, this is particularly the case when Canadian-based SI programs are considered (Zerger, Clark-Unite, & Smith, 2006).

It is therefore possible to identify important gaps in the existing research on peer-assisted learning programs: (1) there are few empirical studies on PASS/PAL/SI programs from Canadian universities; (2) the existing research tends to emphasize only quantitative outcomes of the program with respect to student-participant academic success; and (3) there is a paucity of data concerning the potential benefits of the PASS program to student facilitators, faculty members and institutions. Accordingly, the present investigation sought to determine the effectiveness of the Carleton University PASS program not only in terms of enhancing student academic success, but also in terms of its impact on various facilitator and faculty outcomes. Working with the overarching research question “How successful have the PASS projects been in enhancing learning outcomes?”the aims of this study were as follows:

Empirically evaluate the effect/impact of the PASS program on student academic success at Carleton University through a comparative analysis of the statistical data gathered over the past

two years (2006/07 and 2007/08) – the comparison being between PASS student-participants and non-participants.

Assess the benefits and shortcomings of the PASS program from a student-participant perspective through a qualitative analysis of survey and questionnaire data.
Explore the impact of being a PASS facilitator on professional and academic development and adjustment through a narrative analysis of facilitator autobiographical sketches, as well as through qualitative assessments of survey and interview data. Specifically, it was hypothesized that former PASS facilitators would self-report significant benefits, both academically and professionally, of having been a facilitator.

Ascertain the reactions of Carleton faculty members to the PASS program and to non-remedial supplemental support programs in general. (These faculty members would include both individuals with and individuals without previous experience teaching a PASS-supported course or courses.) It was anticipated that faculty impressions would become more favourable with increasing PASS exposure (i.e., experience teaching PASS-supported courses).

II. General Methodology and Procedures

This research study was based on a combination of quantitative and qualitative techniques, which were applied to the central research questions concerning the impact of PASS on student, facilitator and faculty outcomes at Carleton University. This section of the report provides an overview of the specific methods and procedures used in each stage of the investigation. Relevant research instruments have been included in this report as separate appendices.

The Effect of PASS on the Academic Success of Student-Participants: Quantitative Outcomes

Results in this section are organized into three subsections: (1) student participation, (2) student academic performance and (3) student success adjusted for prior academic performance. For the purposes of quantitative analyses, students were divided into three groups: those who did not participate in PASS (0 hours), those who participated infrequently (1 to 4 hours) and those who participated regularly (5 hours or more).[1] The rationale for doing so was threefold. First, by adopting groupings of participants similar to those of the International Center for Supplemental Instruction at the UMKC, where extensive research has been conducted on the effectiveness of SI and on whose model Carleton's PASS program is based, these analyses were rendered comparable to those most often used and cited (i.e., the "gold standard" of SI research).

Secondly, intuitively, it makes sense that in a 12-week semester, a student who attends roughly every other week (5 hours) would be considered a regular participant. Lastly, in many of the PASS-supported courses, the number of participants was too small to draw meaningful conclusions about more detailed participation rates. Nevertheless, in some of the extended analyses (i.e., the effect of PASS on D, Fail or Withdraw [DFW] rates across faculties, ANCOVA), we do report student participation groups in more detail.

Student Participation and Performance. Average final grades, which were obtained for each student from Carleton's Banner[2] Student Information System, were compared across groups of students based on PASS Attendance (see above for attendance criteria). That is, the final grades of students who did not participate in PASS were compared with the grades of students who participated both infrequently and more regularly. Data from 2006/07 and 2007/08 (from Carleton Banner) were analyzed separately for reasons of conceptual and statistical clarity. However, only the most recent data and analyses (i.e., from 2007/08) are presented in the report proper, with the results from analyses of the earlier data (i.e., from 2006/07) presented

[1] Student participation in PASS-supported courses per semester, based on attendance records submitted by PASS facilitators.

[2] Banner is an integrated suite of administrative computing software for higher education, and one of its systems is devoted to student administrative needs (admission, registration, housing, grades, etc.). It is accompanied by a common Oracle database, where student data are stored and data may be combined for a variety of reporting and query methods.

separately, in Appendix E. It should be noted that there were no substantial differences between the results of the two separate analyses.

Student Performance Adjusted for Prior Performance. The effect of prior academic achievement on student performance (i.e., final course grades) was controlled (i.e., statistically removed) through an analysis of covariance (ANCOVA), whereby prior academic performance was operationalized as students' Overall Admission Average. It should be noted that students' Overall Admission Average, which represents the High School Grade Point Average that Carleton considers as the basis of admission, is the best and most widely available measure of antecedent student ability. In addition to ANCOVA, a regression analysis was performed to determine the relationship between PASS Attendance and final course grade, given students' prior academic performance (based, again, on the Overall Admission Average).

Qualitative Outcomes of the PASS Program: Students, Facilitators and Faculty

In May 2009, an e-mail invitation to participate in an online survey[3] was sent to all the current PASS facilitators (n = 21) and former facilitators who had not yet left the university[4] (n = 15). A link to the survey was provided in this e-mail message, together with a Letter of Information and a Consent Form. At the same time, a similar e-mail message, with a link to an online survey, was sent to all instructors who had taught PASS-supported courses in the previous two academic years (n = 35) and to a random sampling of faculty members who had taught first- and second-year courses (n = 150). Likewise, in May 2009, an e-mail invitation to participate in an online survey was sent to a random sampling of students who had been registered in PASS-supported courses in the previous academic year. All surveys were left active until the end of July 2009, and all three groups (students, PASS facilitators and faculty members) received a follow-up invitation to participate in the survey in June 2009.

During September, the same groups of students, PASS facilitators and faculty members were solicited to participate in focus groups through an e-mail invitation. Interested participants could sign up for focus groups by responding to the e-mail. In addition, the invitation for students to participate in the focus groups was placed on the Student Academic Success Centre's website. Even though a number of facilitators, faculty members and students initially signed up for the focus groups, they did not attend the focus group sessions, due to personal reasons and time constraints. Instead, two individual interviews were conducted with PASS facilitators, and three were conducted with faculty members. None of the students agreed to participate in interviews, although incentives were offered ($20 to be deposited to their students' cards). Still, as will be seen in the corresponding section of this report, the students' survey responses alone were surprisingly informative, permitting evaluation of emerging themes in students' accounts of their first-hand experiences with the PASS program.

[3] Detailed information on all surveys and response rates will be discussed in the corresponding sections below.
[4] Some facilitators graduated and left the university.

The current study also examined the impact of being a PASS facilitator on the academic careers and professional development of the students who performed this function. (See Appendix B.) This was done through a qualitative analysis of survey and interview data, as well as a narrative analysis of the autobiographical sketches[5] of 21 current PASS facilitators. In the original research proposal, we hoped to explore the impact of being a PASS facilitator on the academic careers of those students through a quantitative analysis of the percentage of PASS facilitators pursuing graduate work. We also wished to compare PASS facilitators to other graduates with the same academic standing and with those who had been undergraduate TAs. Unfortunately, Carleton Banner priorities make it unlikely that data of this type will be gathered in the foreseeable future. Thus, we abandoned these research questions and instead analyzed only the information provided by the facilitators themselves.

Survey and interview data allowed for one of the first empirical analyses of faculty reaction to, and impressions of, supplemental support programs. Particular attention was paid to the potential evolution of opinions regarding the PASS program as faculty experience increases in this area (i.e., opinions of faculty with extensive PASS experience vs. those of faculty members without such experience). This part of the study was designed to ascertain critical information about ways that supplemental instruction programs could be administered to encourage more faculty members to seek PASS support for their students. In addition, barriers to faculty acceptance of such programs were assessed, based on the survey and interview data.

A clear limitation of the qualitative analysis portion of this study is its sample size. The number of responses is too limited for broad generalizations, and we cannot argue that the results of the study represent the experience of all the students, faculty members and facilitators involved in the Carleton PASS program. Yet, generalizability was not the main goal of this research. Instead, this study should be seen as a case study, with the aims of describing, in an exploratory way, the experiences of different participants involved in the PASS program and of providing an important overview, as well as insight into some general themes emerging from respondents' narratives. These narratives, we believe, can add extra value to the quantitative analyses.

III. The Impact of the PASS Program: Quantitative Analyses

Student Participation

In 2007/08 (as noted under "The Carleton PASS Program," above), the Student Academic Success Centre at Carleton University provided PASS support for 46 sections of 30 courses. As indicated in Table 1, students enrolled in these courses made extensive use of the PASS service: 2,371 students participated in the PASS program, representing 22.0 per cent of the

[5] See the section of the study about facilitators below (headed "Facilitator Outcomes: Survey Responses, Autobiographical Sketches and Interviews").

10,791 students enrolled in PASS-supported courses in 2007/08. Broken down by faculty, the overall average percentage[6] of registered students who participated in PASS in 2007/08 was as follows: 24.0 per cent in the Faculty of Public Affairs (FPA); 20.6 per cent in the Faculty of Arts and Social Sciences (FASS); 17.1 per cent in the Sprott School of Business; 31.7 per cent in the Faculty of Science; and 14.8 per cent in the Faculty of Engineering and Design. The overall average percentage of registered students who participated in PASS in 2007/08, broken down by course level, can be seen in Appendix D.

Table 1. Student Participation in PASS: All Faculties

	Hours of PASS Attendance				Total Students Participating	
	1-4 hours		5+ hours			
	#	%	#	%	#	%
Faculty of Public Affairs	591	13.7	441	10.2	1,032	24.0
Faculty of Arts and Social Sciences	593	13.7	300	6.9	893	20.6
Sprott School of Business	187	12.1	78	5.0	265	17.1
Faculty of Science	102	18.8	70	12.9	172	31.7
Faculty of Engineering and Design	4	6.6	5	8.2	9	14.8
Σ =	***1,477***	***12.98***	***894***	***8.64***	***2,371***	***21.64***

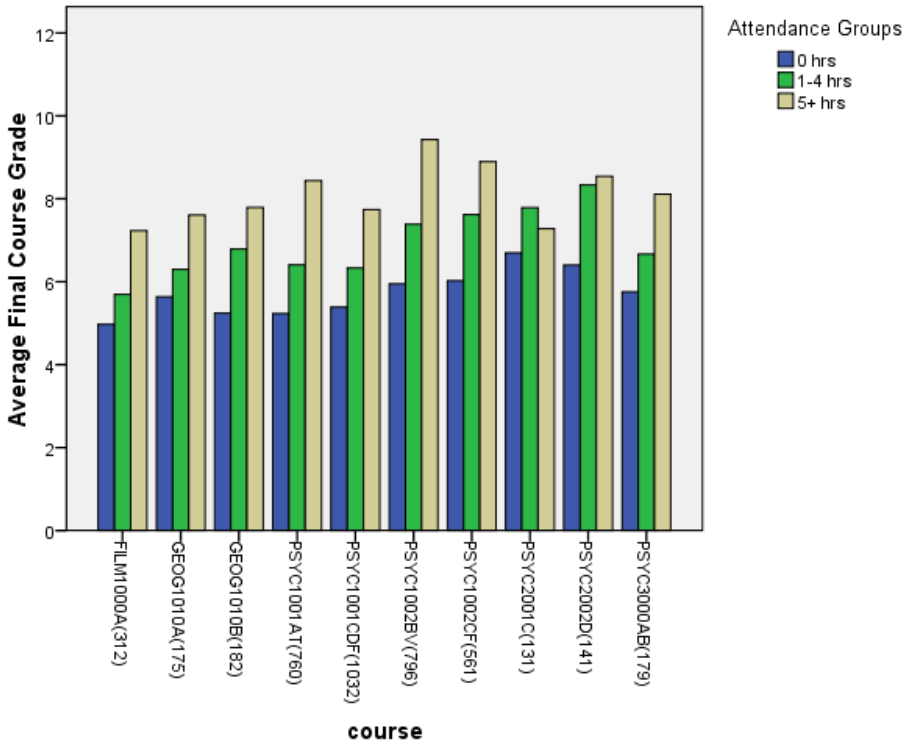
Although attendance figures depict the number and percentage of students who attended PASS, they cannot speak to the extent to which PASS participants in each course used the service. This participation is best assessed by determining the average number of contact hours per student (i.e., time spent in PASS workshops). This average can be calculated by noting, first, that in 2007/08, PASS facilitators provided 13,839 hours of service to registered students. Thus, each of the 2,371 students who chose to participate in PASS that year received an average of 5.8 in-workshop (i.e., facilitator-led) contact hours. Students registered in non-supported sections of PASS courses also occasionally chose to attend PASS. A total of 58 such students attended PASS workshops in 2007/08 for a total of 127 hours (their attendance and grades are not included in any analyses). Moreover, the contact hours reported for the purposes of this study reflect only the time spent in PASS workshops, but facilitators also provided additional student support through weekly office hours and e-mail correspondence.

[6] Unweighted average calculated by adding the percentage of participating students in each supported course and dividing by the number of unique courses in the faculty.

Student Academic Performance

The aim of PASS is not simply to attract large numbers of students, but to help them improve their retention/completion rates and earn higher grades in traditionally difficult courses. Figures 1, 2, 3 and 4 depict the average final course grades[7] of all students in PASS-supported courses (by faculty) as a function of PASS Attendance (i.e., the degree to which students participated in PASS). As these figures show, students who participate in the PASS program clearly outperform their non-participating peers, and those who attend more often benefit most.

Figure 1. Average Final Course Grades of Students Registered in PASS-Supported Courses in the Faculty of Arts and Social Sciences (FASS) as a Function of PASS Attendance



[7] Carleton uses a 12-point grading system that divides each letter grade into three divisions (i.e., A-, A, A+, etc.). Letter grades are translated into numbers for the purposes of performance evaluations. Thus, A+ = 12 grade points, A = 11 grade points, A = 10 grade points and B+ = 9 grade points, etc. These values are for courses with 1.0 credit value. Where the course credit is greater or less than one credit, the grade points are adjusted proportionately.

Figure 2. Average Final Course Grades of Students Registered in PASS-Supported Courses in the Faculty of Public Affairs (FPA) as a Function of PASS Attendance

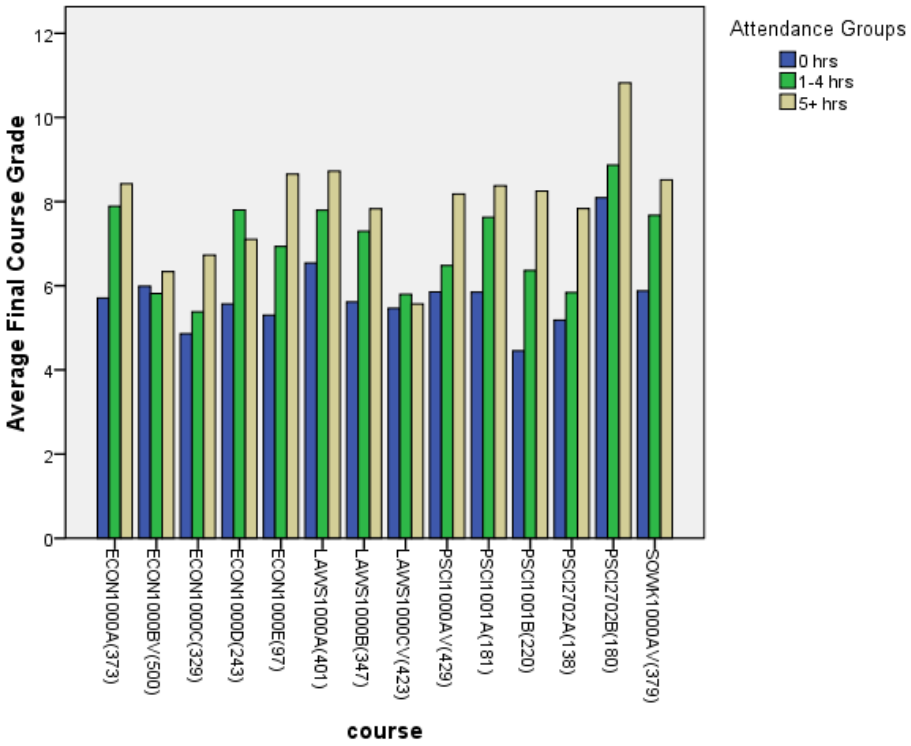


Figure 3. Average Final Course Grades of Students Registered in PASS-Supported Courses in the Sprott School of Business as a Function of PASS Attendance

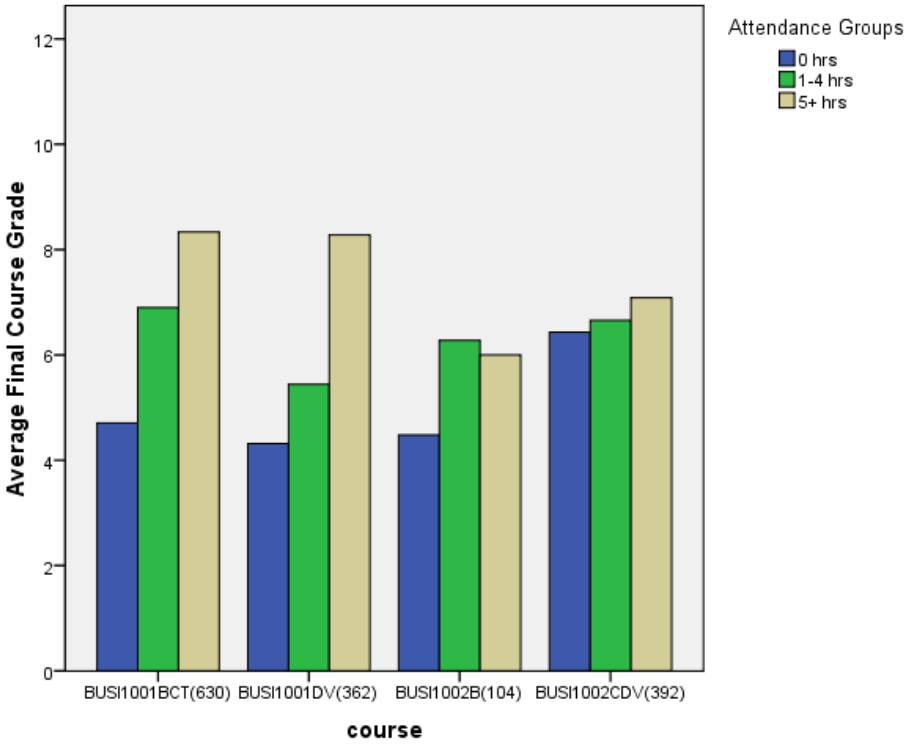
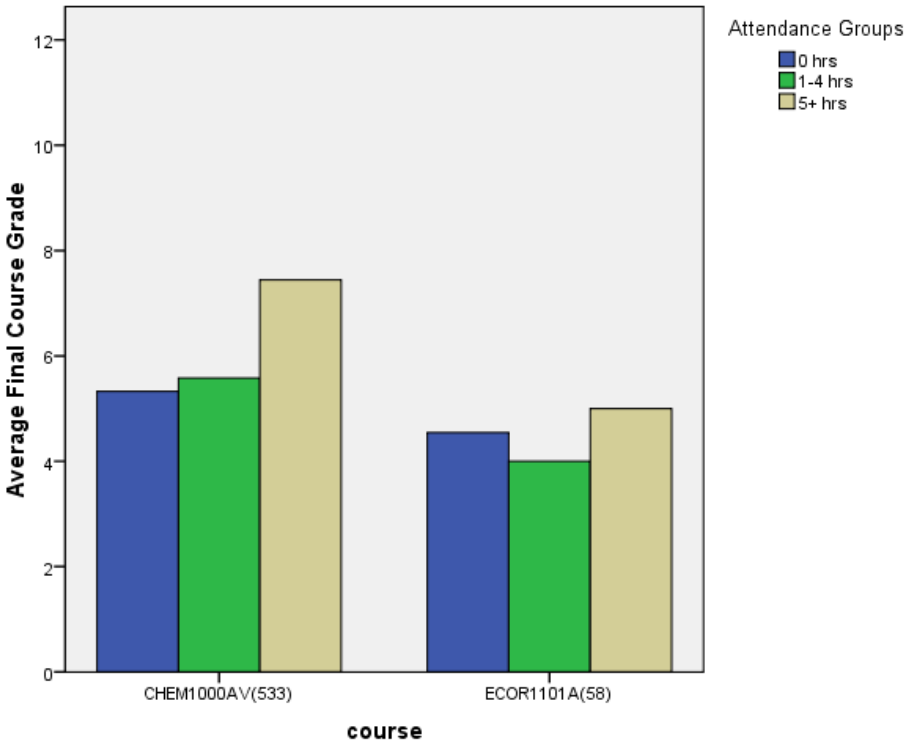


Figure 4. Average Final Course Grades of Students Registered in PASS-Supported Courses in the Faculty of Science (Left Bars – First-Year General Chemistry) and the Faculty of Engineering and Design (Right Bars – First-Year Mechanics) as a Function of PASS Attendance



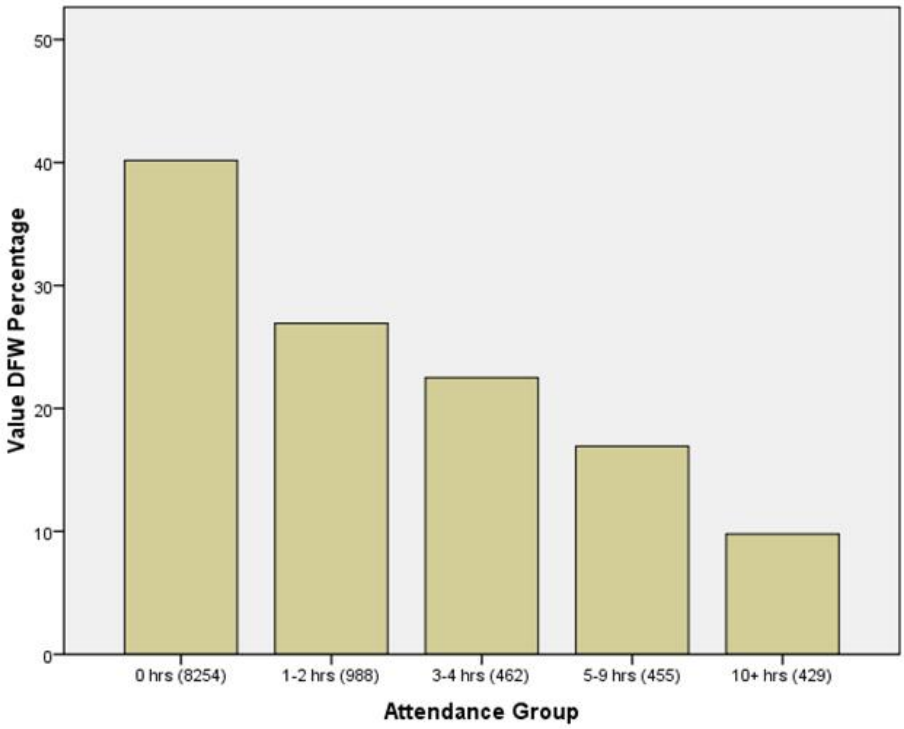
To summarize, students who attended PASS infrequently (1 to 4 hours) usually earned higher course grades, on average, than students who did not attend PASS at all (non-participants). Moreover, students who attended 5 or more hours of PASS usually earned even higher average grades than students who did not attend or who attended only infrequently. In terms of difference scores (i.e., average final course grade of non-participants subtracted from average final course grade of PASS participants), Faculty of Arts and Social Sciences (FASS) and Faculty of Public Affairs (FPA) students who attended 1 to 4 hours of PASS earned, respectively, averages of 1.3 and 1.0 grade points more than non-participants, and those who attended more often (i.e., at least 5 hours) earned averages of 2.0 and 2.4 grade points more than non-participants.

Similarly, students in the Sprott School of Business who attended 1 to 4 hours of PASS earned an average of 1.4 grade points more than non-participants, and those who attended more frequently earned an average of 2.4 grade points more than non-participants. Although infrequent PASS Attendance (i.e., 1 to 4 hours of PASS) was not associated with higher final grades among science and engineering students (they earned, respectively, averages of 0.3 and -0.5 grade points more than non-participants), those science and engineering students who attended at least 5 hours of PASS earned averages of 2.1 and 0.5 grade points more than non-participants. The differences between student improvement in grades by program may be partly

a result of additional laboratory support already available to science and engineering students, while students in some of the other faculties had little or no organized support outside the lecture theatre. This is merely speculation, however – not a conclusion determined through this study.

Another important indicator of student academic success at Carleton University is the number of students in a given class who achieved a grade of "D" or lower and fail or withdraw from the course. This is known as the "DFW" rate for students registered in a given course. PASS support is typically offered for courses with DFW rates higher than 30 per cent. Analysis in the present study revealed that DFW rates were significantly lower among PASS participants than among non-participants in a majority of the PASS-supported courses offered in 2007/08 (i.e., 25 of the 30 courses). Furthermore, as shown in Figure 5, DFW rates, which were obtained from the Carleton Office of Institutional Research, appeared to decrease with increasing PASS Attendance.

Figure 5. DFW Rates in PASS-Supported Courses across All Faculties as a Function of PASS Attendance



Each bar represents the DFW rate among students for each of five different attendance groupings. The number of students in each attendance group is denoted in brackets.

Student Success Adjusted for Prior Academic Performance

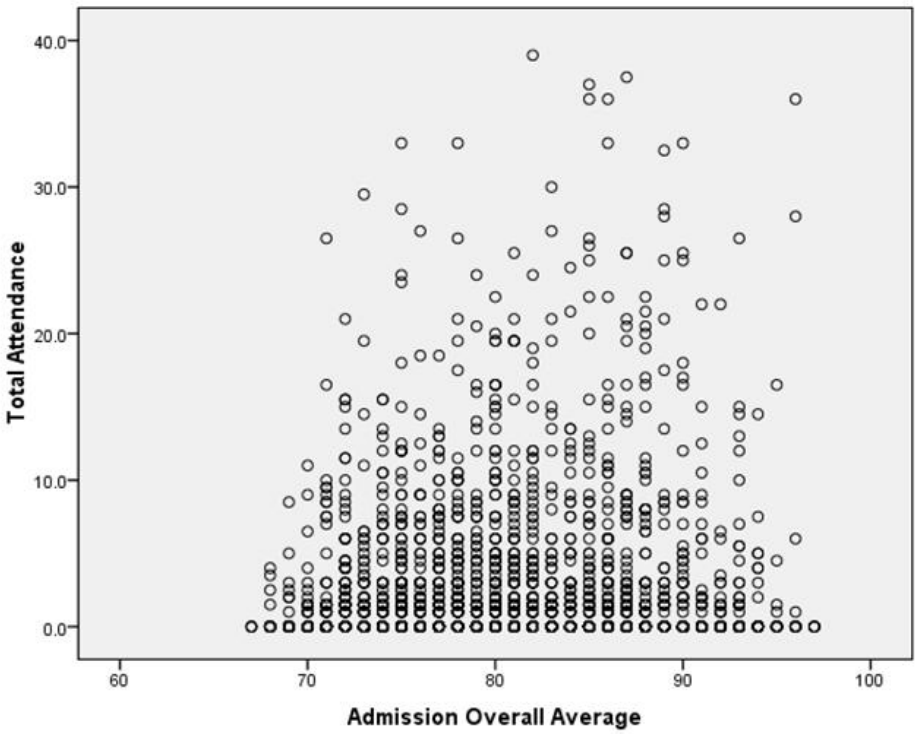
The results presented so far indicate that PASS support is associated with higher final course grades, but they do not rule out the possibility that factors other than PASS attendance, such as students' prior levels of achievement, may account for this relationship. Carleton faculty and administrators have in the past questioned whether PASS is actually affecting students' grades or merely tapping into a pool of high achievers who are seeking the additional support because they are serious about their grades.

In order to determine whether or not this was the case, we examined the relationship(s) between Overall Admission Average, PASS Attendance and Final Course Grade, and to do this, we used two methods: correlation analysis and analysis of covariance (ANCOVA). Because Overall Admission Average is not available for all students registered in PASS-supported courses (e.g., international or out-of-province students), the sample size used throughout these analyses is 4,942. This constitutes only 52.6 per cent of a total of 9,404 students registered (PASS participants and non-participants) in all of the PASS-supported courses in 2007/08 for whom all three variables (i.e., PASS Attendance, Final Course Grades and Overall Admission Average) were available. Of course, the reduction in sample size and the potential for selection bias are matters of concern; however, as previously mentioned, the Overall Admission Average is the best and most widely available measure of prior academic performance at Carleton University.

Correlational Analysis

A key result of the correlational analysis was the weak to moderate significant positive correlation between students' Overall Admission Averages and the number of PASS sessions attended. That is, students with higher Overall Admission Averages attended PASS more often. Positive and statistically significant correlations were found in 12 (40.0 per cent) of 30 PASS-supported courses. These significant positive correlations ranged from $r = .113$ to $r = .324$. This would be consistent with the expectation that those students achieving higher grades in high school sought additional study support more often than those with lower average. With all PASS-supported courses combined, the correlation between Overall Admission Average and PASS Attendance ($r = .112$, $p < .001$, $n = 4,942$) was only a weak one, albeit statistically significant due to the large sample size. This indicates that students who attended PASS more often tended to have higher Overall Admission Averages. However, the relationship is a weak one, in which only a little more than 1 per cent of variance is shared between the two variables and is hardly discernible in the scatterplot shown in Figure 6. This correlation was slightly higher ($r = .091$) than that reported in the previous year (2006/07).

Figure 6. Scatterplot of Overall Admission Average by Total PASS Attendance



Note how the relation between the two variables, although statistically significant due to the extremely large sample size, is barely discernible.

In addition, the analysis revealed that PASS Attendance and Final Course Grade are significantly correlated ($r = .171$, $p < .001$, $n = 4{,}942$) and that Overall Admission Average has an even stronger relation with Final Course Grade ($r = .495$, $p < .001$, $n = 4{,}942$). In order to determine the true relation of PASS Attendance and Final Course Grade, it is necessary to examine the extent to which the positive association between these two variables is due to the effect of Overall Admission Average on both PASS Attendance and Final Course Grade. For this, a statistic known as "partial correlation" was employed to capture the relationship between two variables (i.e., PASS Attendance and Final Course Grade), with the effect of a third variable (i.e., Overall Admission Average) statistically controlled. The partial correlation was .134, and the results were statistically significant ($p < .001$, $df = 4{,}939$). This indicates that, above and beyond any effect Overall Admission Average has on both PASS Attendance and Final Course Grade, PASS Attendance is significantly associated with higher Final Course Grades among students in PASS-supported courses.

Analysis of Covariance (ANCOVA)

In addition to the correlation analyses, an analysis of covariance (ANCOVA) was performed to isolate the effect of varying degrees of PASS Attendance on Final Course Grades, with the effect of students' Overall Admission Average statistically controlled. Using this method, students' "adjusted" average grades in the PASS-supported course were generated. In essence, these "adjusted" grades show the effect of attending PASS on students' Final Course Grades, above and beyond any effect attributable to Overall Admission Average. The column labelled "Average Final Course Grade" in Table 2 represents the unadjusted average grades for students whose PASS Attendance ranged from 0 hours to 10 or more hours, again using the more narrowly defined attendance groupings employed in the analysis of the effect of PASS Attendance on DFW rates (see Figure 5). In this regard, the unadjusted average grade for non-participants was 5.62, with a steady increase across PASS Attendance groups up to 8.16 for 10+ hours of attendance. Also depicted in Table 2 is the average Overall Admission Average for students at each level of participation in PASS. The average Overall Admission Average of non-participants was 79.2 per cent, and this climbed 2.9 percentage points to 82.1 per cent for the most frequent PASS participants.

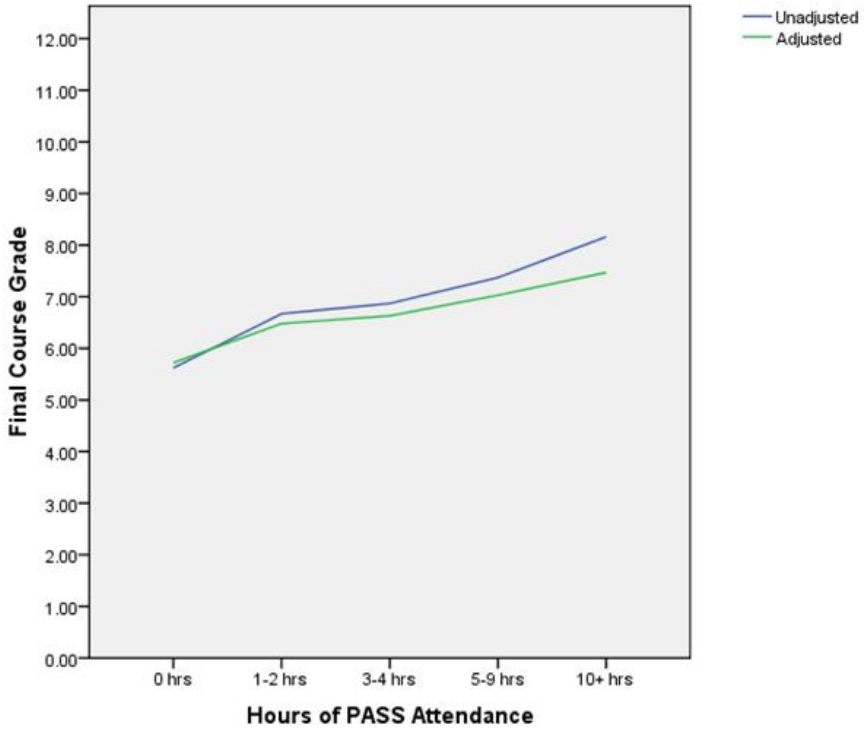
Table 2. Summary Table of the Difference Scores in Final Course Grades between PASS Participants and Non-participants, Adjusted for Overall Admission Average, Using ANCOVA

Attendance Groups	Average Final Course Grade	Std. Deviation	Overall Admission Average (%)	Adjusted Average Final Course Grade	Std. Error	**Difference from Non-participants, Adjusted for Overall Admission Average**	*n*
0 hrs	5.62	3.65	79.2	5.72	0.05	**0**	3,781
1 to 2 hrs	6.67	3.47	80.2	6.48	0.14	**0.76**	522
3 to 4 hrs	6.87	3.30	80.4	6.63	0.21	**0.91**	211
5 to 9 hrs	7.37	3.09	80.7	7.03	0.21	**1.31**	228
10+ hrs	8.16	2.93	82.1	7.47	0.22	**1.75**	200
Total/ Average	6.94	3.29	80.5				4,942

The column labelled "Adjusted Average Final Course Grade" shows that averages increased with frequency of PASS participation, with non-participants receiving the lowest adjusted average course grades. The column labelled "Difference from Non-participants, Adjusted for Overall Admission Average" indicates that compared to non-participants, those who attended PASS earned higher Final Course Grades, even when the effect of Overall Admission Average on Final Course Grades was controlled. The grade differentials range from 0.76 of a grade point for students attending 1 to 2 hours of PASS (e.g., potentially the difference between a grade of C- and a grade of C) to 1.75 grade points for those who attended 10 hours or more (e.g., potentially the difference between a grade of C- and grades of C+ or B-).

Figure 7 plots the unadjusted and adjusted average grades of students as a function of PASS Attendance. Although removing the influence of Overall Admission Average on Final Course Grades slightly reduces the impact of PASS Attendance on Final Course Grades, students who attended PASS more often (i.e., students who had higher levels of PASS participation) still performed much better than students who attended less often.

Figure 7. Unadjusted (Blue Line) and Adjusted (Green Line) Average Final Course Grades by PASS Attendance



Thus, on average, students who attend PASS tend to have a higher Overall Admission Average than those who do not participate in the program. However, using both correlation analysis and analysis of covariance, results indicate that when the influence of Overall Admission Average is statistically controlled, PASS remains effective as a means of increasing course grades for participating students.

Summary of Key Findings

- In 2007/08, the PASS program at Carleton supported 46 sections of 30 courses.
- Across all PASS-supported courses, 22 per cent of registered students chose to participate in PASS.
- Even students registered in non-supported sections of PASS courses occasionally chose to attend PASS.
- PASS facilitators provided 13,839 hours of service to registered students.
- PASS participants earn higher final course grades than non-participants, even when prior academic achievement (Overall Admission Average) is taken into account.
- DFW (Ds, Fs and withdrawals) were statistically significantly lower among PASS participants in the majority of the PASS courses.

IV. The Impact of the PASS Program: Qualitative Analyses

Student Outcomes: Survey Responses

Presented here are the most salient findings from the qualitative analysis of student survey responses – of both PASS participants and non-participants (where relevant) – that address students' perceptions of the PASS program at Carleton University.
In May 2009, an e-mail invitation to participate in an online survey was sent to a random sampling of students who had been registered in PASS-supported courses in the previous academic year. Of 150 students surveyed, 25 responded, resulting in a 16.6 per cent response rate. As was previously noted, the response rate was too low to warrant generalization of the findings, but the findings did seem to provide some explanation of the qualitative results, and students' responses did illuminate their own personal PASS experiences (albeit for only a small sample of Carleton's students).

Of the 25 students who chose to participate in the online survey, 19 reported having attended at least one PASS workshop at Carleton. Specifically, 2 students indicated that they had attended one PASS workshop, another 2 reported having attended two to four and the remaining students (15) indicated that they had attended PASS workshops regularly (five or more times). In order to determine Carleton students' perceptions of the benefits of the PASS program, survey participants were asked to rate a series of six statements (see Appendix A for more detail) concerning different aspects of PASS. A Likert-type scale was used (i.e., where "1" indicates strong disagreement with the statement and "5" denotes strong agreement). The highest agreement (4.89/5.00) was observed for the statement "I think this class is challenging enough that PASS was needed/wanted." It appears that students' subjective perceptions of course difficulty are aligned with the institutional criterion for offering PASS support (i.e., DFW rates equal to or higher than 30 per cent) and that students favour access to supplemental learning instruction in the form of peer-led PASS workshops in these courses. Survey participants were also asked to comment on two items designed to assess students' perceptions of the effectiveness of the PASS program in enhancing their academic success – namely, "I think PASS helped me improve my overall course mark" and "The workshops were helpful." Students were in strong agreement with these statements (4.52 and 4.66, respectively). Therefore, survey respondents' subjective appraisals of the effectiveness of PASS in increasing their final course grade was concordant with the results of the quantitative analyses that revealed a significant effect of PASS on student academic success, such that final grades were higher among PASS participants than among non-participants.

When asked about their reasons for attending PASS workshops, the majority of respondents (n = 8) indicated that they needed extra help with difficult courses and course concepts ("For both second year research methods and third year statistics, I felt it was necessary to go as I am very bad at math"). Four students wanted to improve their grades and two respondents were just curious ("I figured that it must be offered for a reason so I decided to check it out. Once I started going, I found it extremely helpful and beneficial.") while the rest (n = 5) wanted to pick

up study skills, such as organizing their notes and time management ("To see what it was about and see if I could pick up any studying tips").

The training, abilities and teaching style of the PASS facilitators was shown to have a substantial impact on students' opinions of the efficacy of the PASS program. Students' assessments of the effectiveness of PASS were closely related to their overall impressions of the PASS facilitators, in terms of both the amicability and the preparedness of those facilitators. Students were in strong agreement with the statements "The PASS facilitator was friendly and welcoming" and "The PASS facilitator was well-prepared for workshops," as they assigned an average rating to these statements of 4.78 and 4.73, respectively. These findings are important, considering the great influence of facilitator preparedness on the effectiveness of PASS and, in a related sense, on the translation of PASS's theoretical ideals to the classroom setting (i.e., the use of peer-led facilitation and collaborative learning to improve the grades of student-participants in difficult courses). In addition, having a friendly and welcoming PASS facilitator can make collaborative learning more enjoyable and less threatening and ensures that PASS workshops are informal and engaging (which is the intention of the program). Thus, our data seem to confirm what several theorists (see Capstick, 2004) have previously suggested – that students' psychosocial adjustment and engagement in university life may be bolstered by regular attendance at supplemental instruction workshops, where a friendly and welcoming facilitator leads group discussions and encourages collaboration among peers.

Students were only in modest agreement (3.73) with the statement "The workshops taught me skills I can use in other classes." This suggests that students did not perceive that the study skills learned in the PASS workshops were easily transferable to other courses. This is not in concordance with one of the stated aims of the PASS program or with supplemental instruction more generally – that of teaching students the process of learning while integrating course-specific content. Considering how students' responses indicated that attending PASS benefited their academic success by helping them achieve a higher final course grade, it may be that Carleton's PASS program, as currently implemented, does a better job of imparting course-specific content than of developing more general (and transferable) study skills. Alternatively, it may be that young undergraduate students[8] are not yet fully receptive to, or capable of, abstracting the learning process and are instead focused largely on the tangible benefits offered by the PASS program (i.e., grade improvement in specific, challenging courses). It is also possible that this self-report instrument may not be rigorous enough to determine the transferable skills that students are actually taking away from the sessions, and it is also possible that students are gaining more transferable skills than they are aware of at this early point in their academic careers.

While students reported receiving many benefits from PASS, especially with respect to their academic success and mastery of study skills, they also identified several shortcomings of the program (although several students indicated that they wouldn't change anything about PASS). A particularly common theme in this regard was the perceived lack of resources and the scheduling of PASS workshops at inconvenient times. In the words of one respondent, "If I had

[8] It will be recalled that PASS support is typically offered for traditionally difficult first-year courses.

to change something it would be to have more time slots available because some people aren't on campus very often."

In order to fully establish the range of perceived shortcomings of the PASS program, as identified by students who responded to the survey, these student-participants were asked about their reasons for halting their attendance at PASS sessions. However, many of the students who responded to this question indicated that they didn't miss any PASS workshops (e.g., "None, I attended all of them") or they missed workshops only due to unforeseen and uncontrollable circumstances (e.g., "The only time I stopped attending was when I had sprained my ankle and was on crutches and was unable to use stairs"). Two respondents left the program because they felt PASS support was not warranted or was no longer warranted, given the perceived lack of difficulty of the course for which PASS support was being offered ("I attended PASS for first year psychology and I stopped because I did not find the course material challenging enough to have to attend PASS").

The most common theme among students' responses to this question was that of poor resource allocation/unavailability of the PASS workshops (e.g., "Time constraints; I couldn't get in at the specific times because of classes/work"; "Maybe the time is not very good"). Thus, it would appear that the biggest issue facing Carleton's PASS program, at least in the eyes of student-participants, is that there simply aren't enough PASS workshops at conveniently scheduled times to satisfy demand.

The aforementioned data and accompanying qualitative analyses pertain only to those students who chose to participate in the PASS program and to respond to the survey instrument. However, in addition to investigating the opinions and motivations of PASS students, this study also sought to determine students' reasons for not participating in PASS whatsoever. Table 3 summarizes the responses of the six student non-participants who chose to complete the online survey. Students were asked to agree or disagree with several statements (see Appendix A).

Table 3. Survey Responses of Students Who Chose Not to Attend PASS

Survey Item	No. of Students in Agreement
I did not even know about PASS.	2
I wanted to attend but couldn't due to a conflict with my class schedule.	0
I wanted to but couldn't due to a conflict outside of school (e.g., job, family, etc.)	1
I intended to go but never found time.	0
I thought I would do well in the course without attending PASS.	1
I did not think PASS would help me do better in the course.	1
PASS did not appeal to me.	1
I tried PASS for another course and didn't like it.	1

Due to the small number of responses, it is extremely difficult to make any claims solely on the basis of this survey. However, not unlike the case for student-participants, it appears that the lack of conveniently scheduled PASS workshops constituted a barrier to PASS participation for those students who did not attend PASS at all. In addition, two students reported that they "did not even know about PASS." This may be important if it indicates that a large proportion of

students are not aware of the existence of the program soon enough to participate in it and therefore are not likely to respond to a survey that evaluates the program's impact. However, our data are limited and do not allow a conclusion of this kind. Still, one possible strategy to alert students to the presence of PASS support for a given course would be to launch a concerted and aggressive advertising campaign to bolster student awareness of supplemental learning services. This could be done, for example, through the student newspaper, departmental e-mail notices and, most importantly, encouragement by the professor of a course that is supported by PASS.

Summary of Key Findings

- The teaching style and positive attitude of the PASS facilitators have a substantial impact on students' opinions of the efficacy of the PASS program.
- The study skills learned in the PASS workshops were not perceived by students to be easily transferable to other courses.
- Students indicated a desire to have more PASS workshops at conveniently scheduled times.

Facilitator Outcomes: A "Typical" PASS Facilitator

Before we present the findings from the qualitative analysis of PASS facilitators' responses, it would be useful to describe a "typical" Carleton PASS facilitator. Data from the Student Academic Success Centre,[9] which administers the PASS program, show that a "typical" PASS facilitator is in her/his early to mid-20s and, in the majority of cases, in the third or fourth year of her/his studies, although there are also a few facilitators who are second-year students. People of both genders are equally represented, as are those of a variety of races, ethnicities, cultural backgrounds and years living (or born) in Canada. To be accepted as facilitators, students are required to have a minimum of an A- in the course they are facilitating, an overall CGPA of B+ and a CGPA in their major of A-.

Carleton's Student Academic Success Centre has developed a strict and elaborate hiring process for facilitators. In early May, when all final grades have been posted on Banner, those grades are inspected – within all the courses that will have PASS support for the following academic year. For each of these courses, the final grades are gathered from every section, together with the students' names, their student ID and their major and Overall GPA. All students whose grades in the course are lower than an A- are deleted from the list, and e-mails

[9]All data about a "typical" facilitator, hiring process and wages have been provided by Samantha Short, PASS Coordinator, Student Academic Success Centre, Carleton University (personal correspondence).

are sent out to the remaining students who have taken the course and who are not in their final year of studies. The e-mail simply states that these students are eligible to apply for a facilitator position for the PASS program. Information on how and where to apply is given, along with deadlines. Students' applications, which include resumés and cover letters, are then received by e-mail. After the application deadline, applications are reviewed, and the selected candidates proceed to the next step: group interviews (with approximately 60 students). From the group interviews, two to five applicants per course (on average) are selected for individual interviews. Final selection of successful candidates occurs by the end of July.

Carleton facilitators are paid $17.32 per hour in their first year. Their pay increases by $1.00 per hour each year thereafter. They work, on average, 10 hours per week, for a total of 275 hours over the full academic year. Facilitators' total wages (about $4,953.00 per academic year) also include paid pre-service and in-service training throughout the year. (The pre-service training takes place over three days in early September.)

The number of facilitators who return for a subsequent year depends on a number of factors: (a) what year they were in when hired (for example, fourth-year facilitators would be graduating and thus not returning to Carleton), (b) whether the course they facilitated is to receive PASS support the following year, and (c) whether the facilitator is deemed competent to return to the position for another year. Given these conditions, about 40 per cent are returning facilitators, who do this work for multiple academic years.

Facilitator Outcomes: Survey Responses, Autobiographical Sketches and Interviews

In this section, findings are presented from the qualitative analysis of PASS facilitators' survey responses, organized according to thematic content, and supplemented, where appropriate, with illustrative passages from one-on-one interviews with two current PASS facilitators and the most salient results of a narrative analysis of PASS facilitator autobiographical sketches.
All of the current PASS facilitators (n = 21) and former facilitators who have not yet left the university (n = 15) received a survey invitation in May 2009. Of the 36 facilitators surveyed, 14 responded, giving a response rate of 38.8 per cent.

We also analyzed 21 autobiographical narratives written by current PASS facilitators. The purpose of these narratives is to introduce an individual facilitator to his/her students and the general public. All of them, along with the facilitators' photos, are published on the Student Academic Success Centre's website. In their autobiographical sketches, the facilitators have the freedom to write what they consider to be most important. These short narratives provide rich data concerning the demographic characteristics of each facilitator, but they also often describe the facilitator's academic goals, as well as his/her personal interests outside the university.
As presented in Table 4, when facilitators were asked the question "What motivated you to become a PASS facilitator?" they identified a number of factors that led them to pursue such a role. Chief among facilitators' responses was the recognition that being a PASS facilitator would provide them with the opportunity to develop their leadership abilities (9 out of 14 respondents agreed with this statement). Also receiving strong support among PASS facilitators were

statements that reflected their desire to engage more fully in the learning process, either through sharing their "love of learning" (9 out of 14 respondents) or by imparting "what I know about the subject" (9 out of 14 respondents). In addition, 6 out of 14 respondents were motivated to become facilitators in order to "further my own learning."

Moreover, 50 per cent of the survey respondents indicated that a desire to "gain teaching experience" was a motivating factor in having become a PASS facilitator. Thus, it appears that PASS facilitators, generally speaking, tend to hold both the sharing and the receiving of knowledge in high regard and, as such, may be excellent role models for the young student-participants in the PASS program. If it can be established that being a PASS facilitator does, in fact, lead to the realization of goals such as gaining teaching experience and developing leadership abilities, this will be sound evidence that PASS is associated with tangible benefits – not only for student-participants, but also for the students who serve as facilitators.

Table 4. Motivating Factors of Becoming a PASS Facilitator as Identified by Facilitators

Survey Item	Response	
	Yes	No
I wanted to develop my leadership abilities.	9	5
I wanted to gain teaching experience.	7	7
Being a facilitator looks good on a resume.	0	0
To give back after having a good experience with PASS as a student.	4	10
It is a way to get to know other students.	4	10
It is a way for me to further my own learning.	6	9
I wanted to share my love of learning.	9	5
I wanted to share what I know about the subject.	9	5

Fundamental to the effective implementation of Carleton's PASS program (and this may be extended to any similar SI program) is the training of facilitators in relevant pedagogical theory and in the use of concrete learning/study skills strategies. In order to ascertain whether the training received by PASS facilitators was, in their estimation, adequate to prepare them for the role of facilitator, the following question was posed: "To prepare you for your PASS facilitator role you were provided with both pre-service and in-service training. Did this training prepare you well for your role as a facilitator?" Of the 14 respondents, all but one indicated that the training they received was sufficient. Facilitators felt they had benefited from practical exercises and hands-on sessions on topics such as interactive learning activities, the preparation of workshops and speaking in front of a class. As revealed in the following excerpt from one-one-one interviews conducted with former PASS facilitators, modelling of appropriate interactions and the pairing of practical learning exercises with pedagogical theory rendered PASS training especially useful:

[Facilitator training] taught us different things we could do in our workshops, and showed you how to be a facil by being a facil. So, they [facilitator team leaders and the PASS coordinator] didn't tell you, they didn't lecture. . . . Instead, they modeled the training sessions like a workshop, and that made us learn how to do things for our own workshops. So, they gave us practical tools, as well as introducing us to learning theory and principles. So there was theory – it wasn't just how to give a quiz or something like that.

Furthermore, when facilitators were asked to describe what additional items they would like the training to focus on, most chose not to respond to this question, perhaps indicating, as is suggested by the following facilitator comment, that the currently administered facilitator training is more than adequate:

I think it would be a detriment to the training to focus on one aspect more than others. I found the learning theory absolutely informative, but it would be useless if it wasn't accompanied by practical “how to apply this to your workshop” ideas. I think the biggest asset to the training is how comprehensive it is. There is always a little something for everyone!

Only one respondent indicated that training might be improved by taking into account past facilitator experience (in order to optimize the learning process):
New facilitators, though well trained, always feel a bit thrown to the wolves come their first workshop. There should be more opportunity for one-on-one evaluation of facilitator performance in the training. Returning facilitators should be partnered with incoming facilitators to work on their individual strengths and weaknesses.

In addition to facilitators’ perceptions of the effectiveness of the training they received, the study set about to ascertain facilitators’ views regarding the benefits of the PASS program – both for themselves and for their students. In the former case, it was anticipated that PASS facilitators would derive substantial benefit from acting in such a capacity, with respect to both professional/career development and continued academic success. Although the evidence is equivocal due to a paucity of research studies, particularly on the Canadian SI landscape, scholars have theorized that PASS may affect the PASS facilitators themselves more than students, faculty or institutions (Stout & McDaniel, 2006).

As can be seen in Table 5, Carleton’s PASS facilitators did self-report many diverse benefits from their experience as facilitators with the PASS program. These findings indicate that the benefits of PASS to facilitators not only matched their expectations of PASS-related benefits to themselves (i.e., their motivations for becoming facilitators – see Table 4), but in fact exceeded those expectations.

Table 5. The Benefits of the PASS Program to Facilitators as Reported by Facilitators (*n* = 14)

Survey Item	Response	
	Yes	No
Enhanced knowledge of subject matter.	14	0
Improved leadership skills.	12	2
Gained teaching experience.	13	1
Got to know a professor well.	11	3
Got to know other students.	11	3
Increased self-confidence.	10	4
Enhanced communication skills.	12	2
Improved my own learning.	13	1
Contributed to the learning of others.	14	0
It was rewarding to see others succeed.	14	0

The overarching sentiment reflected in facilitators' comments was that of great appreciation for the PASS program and recognition of the many benefits of being a PASS facilitator. Many of these themes also arose in the one-on-one interviews conducted with PASS facilitators:

I learned so many things: How to do workshops, how to talk in front of 10, 15, 20 people, how to deal with different personalities, different learning styles. I learned a lot in terms of management skills – in terms of how to manage a classroom, how to manage people . . . those sorts of things. Another thing I learned from being a facil is how to give critical feedback. You attend each other's sessions to give personal feedback and you actually attend their workshop and say two good things they did, and two things they could improve on. That was always a challenge, but it got me thinking more critically about things.

When asked, "To what extent did working as a PASS facilitator impact your academic and career goals?" facilitators indicated that being a PASS facilitator had a marked effect on their academic or professional goals (e.g., to pursue graduate or professional school) and, in many instances, caused them to rethink their field of study or choice of profession. Within the 21 autobiographical sketches, 12 facilitators stated that they had plans to continue their education. Specifically, 5 facilitators planned to go to graduate school, 4 to law school and 1 to medical school, while 2 were interested in teachers' college. The collected data were insufficient to support speculation as to whether these were the students' original goals and whether the same students would have pursued graduate education even if they had not been in the facilitator's role in the PASS program. Nevertheless, in at least two cases, it seems the PASS program did change the facilitators' academic paths ("Immensely! In terms of my career goals, it has totally changed my focus so that now I want to work within education . . ."; "Being a PASS facilitator gave me the motivation to reach higher in my academic and career based goals") (emphases added).

Thus, it would appear that being a PASS facilitator is associated with marked benefits, in particular with respect to the acquisition of skills afforded by PASS training and leading group workshops that are clearly translatable to academic and other professional settings. In addition, respondents indicated that being a PASS facilitator bolstered their professional resumé and had a positive impact on their chances of finding employment: "In terms of career goals, it did impact it in a positive way because employers did notice the position on my resume, and many asked about my experience from being a facilitator." It is notable here that while this benefit was specifically mentioned, no facilitators indicated in the survey that improving their resumé was a motivation for becoming a PASS facilitator initially (see Table 4).

Lastly, in an attempt to independently corroborate students' subjective assessments of whether the PASS program effectively enhanced their academic success, facilitators were asked to comment on the impact that PASS had on their students. The responses gleaned were very informative and, for the most part, echoed the findings of the qualitative analysis of students' perceived benefits of the PASS program. In parallel with students' comments, all facilitators believed that the PASS workshops enhanced students' academic success by facilitating students' understanding of the course content, helping them develop effective study skills (e.g.,

time management) and giving students an opportunity to work collaboratively with their peers in a safe environment.

Summary of Key Findings

- A "typical" PASS facilitator is in her/his early to mid-20s and in the majority of cases in the third or fourth year of her/his studies.
- To become a facilitator, students must have a minimum of an A- average in the course they are facilitating.
- PASS facilitators believe that pre-service and in-service training prepare them well for the role of facilitator.
- PASS facilitators benefit from the program themselves, acquiring, for instance, improved leadership skills, mastery of course content, enhanced communication skills and motivation to attend graduate school.

Faculty Outcomes: Survey Responses and Interviews

In this final results section, the views of Carleton faculty members regarding the PASS program are presented. As was the case for students and facilitators, at the end of May 2009, an online survey was sent to all instructors who had taught PASS-supported courses during the previous two academic years (n = 35) and a random sampling of faculty members who were teaching first- and second-year courses (n = 150). Of the 185 faculty members surveyed, 42 responded, resulting in a response rate of 22 per cent.

Survey responses included both faculty members who had experience teaching a PASS-supported course or courses (n = 26) and those who had yet to teach a PASS-supported course or section (n = 16). These survey results, which are again presented according to thematic content, are supplemented with illustrative passages from one-on-one interviews conducted with professors who have taught PASS-supported courses (n = 3).

Both groups believed that the PASS program is beneficial for students, and 14 of the 16 faculty members who had never taught a PASS-supported course indicated that they would definitely consider having PASS workshops to complement their course, were they to be offered. Faculty members cited a range of benefits to students, including improved understanding of course content (through practice, discussion and revision), a decrease in student anxiety and higher course grades:

[PASS workshops are] highly effective. Students who go rely on them to create a separate intellectual community outside the classroom. I am routinely asked questions at the beginning of class that are introduced with the phrase . . . "We couldn't figure this out in PASS." This is a good thing, not a bad thing. It means that they have solved all the easy problems, leaving me free to handle the deep questions.

Still, some concerns remain. One issue centres on a perceived lack of faculty control over what transpires in PASS (e.g., which parts of the course content receive the most emphasis in the PASS workshops). Faculty members were asked whether they would be more interested in having PASS support for their courses if they could exercise more control over the curriculum presented in PASS workshops (see Appendix C). About one-third (9 out of 26 faculty members) of the respondents indicated that they would. Thus, in at least some cases, lack of control over PASS workshop curriculum may be a primary motivating factor in faculty declining PASS support for their courses. The following excerpt from an interview supports this postulate:

[I have] mixed feelings [about PASS]. Students were often confused in the PASS workshops. [. . .] I also provided many mock exam questions for you to use. And yet, at the end of the day, I felt that I had absolutely no control over these sessions.

Nevertheless, this is not a common occurrence at Carleton. An overwhelming majority of our faculty members do recognize the value of the PASS program (14 out of 16) – and they are enthusiastic about making it a supplemental study tool for their course.

It is possible that many of Carleton's faculty members' concerns could be alleviated if a more concerted and comprehensive effort were made to better inform them about how the PASS program operates (i.e., its philosophy, facilitator training and practical aspects of the workshops) and about the potential benefits to students. When faculty were asked to identify factors that might motivate more faculty members to request PASS support, most responses indicated that information about the PASS program and its benefits to students and faculty would be useful. As one respondent put it: "I think any faculty member would promote PASS if they were aware of its benefits." Another, more pressing concern for faculty members is poor student attendance at PASS workshops:

PASS is difficult because it's not very well attended. So I do question how efficient it is to run PASS workshops. I think it's a great experience for the students that attend – a lot of the time . . . it's not entirely positive, but most of the time it's a good experience. But the attendance is minimal for a lot of these classes . . .

This may be why faculty members, even though generally having a positive view of PASS, did not see improvement in students' performance (Table 6). Only 4 of 26 faculty members indicated that PASS improved the performance of students as measured by final course grades; the same number indicated that PASS improved student in-class participation and increased the sense of community among students in the classroom. It was suggested by some faculty survey respondents that, because of insufficient numbers of students attending PASS workshops, PASS does not have a discernible effect on overall grade distribution. One interviewed faculty member had this to say:

[PASS has no effect] that I would see in the final results; because I don't think that enough people were taking advantage of the PASS sessions. However, I always get positive feedback from the PASS facilitator . . . I know it's working. Is it making a significant difference on the course at all? Unfortunately not because I don't think enough people are going; I just wish they would. What they need to see is some tangible benefit.

In effect, it appears that low overall attendance rates are minimizing the potential for positive impact that PASS may provide for student outcomes (i.e., for those students who actually attend the workshops) – at least as perceived by the instructors themselves. Nonetheless, when the quantitative data are systematically analyzed, PASS does, in fact, lead to higher final course grades and lower DFW rates among those students who attend PASS worksh

Table 6. The Benefits of the PASS Program to Students as Perceived by PASS-Experienced Faculty Members

Survey Item	Response	
	Yes	No
Improved performance of students as measured by course grades.	4	22
Improved participation of students in the course.	4	22
Decreased demands on my time and office hours because students are able to seek help from PASS facilitators.	3	23
Increased sense of community in the classroom.	4	22

Finally, although the question was not directed specifically to faculty survey respondents, two of the three faculty interviewees mentioned that they had benefited personally from the PASS program. In both cases, these benefits resulted from some effect that the PASS program was having on their own lecture skills or teaching style:

Because it was the first time I was teaching, I actually encouraged the facilitator to give me some feedback on lectures – on essentially my performance, because I know that the PASS facilitator had to attend; and it was a great benefit in terms of helping me to improve my lecture skills and allowing me to essentially see what the students saw – because I had that voice from out-in-the-crowd. So that was the greatest benefit I've had with PASS.

Similar sentiments were expressed by another faculty member:
[Having PASS support] influences how I present material. Because I don't have to expend effort on the sort of organization that PASS is doing – forming them into groups, getting them to talk over assignments and that sort of stuff. A lot of the review, PASS handles mock exams, I don't. Yeah, I've actually changed the way I present stuff in class, because PASS handles – I delegate certain things to PASS.

Thus, in addition to the previously noted PASS-derived benefits to students and facilitators, it appears that the PASS program may have tangible benefits for faculty/instructors. As suggested by the above quotations, instructors may also experience some improvements in their teaching skills and lecturing style as a result of PASS exposure (and facilitator feedback), just as PASS facilitators are likely to see gains in their academic abilities, self-confidence and leadership skills

due to extensive PASS training. In this regard, the benefits of PASS to students are twofold: first, students benefit directly from higher course grades and a better understanding of the course material and secondly, students are the indirect recipients of the benefits derived from PASS by instructors and facilitators alike (in the form of better teaching and facilitation).

Summary of Key Findings

- The majority of faculty members believe that PASS sessions are beneficial to students who choose to participate, and those who have never experienced PASS would consider requesting a PASS workshop to complement their courses.
- Faculty members would like to have better communication with PASS facilitators and more control over the curriculum presented in PASS workshops.
- The PASS program helped some faculty members enhance their teaching strategies.
- Faculty members are very concerned about low attendance rates at PASS sessions and about the limited resources available through their faculties for funding of PASS courses.

V. Recommendations for Future Directions

The results of this study indicate that the PASS program as implemented at Carleton University is an effective means of enhancing student academic success. As results from the quantitative analyses indicate, DFW rates are lower among PASS participants than among non-participants and students who attend PASS tend to achieve higher course grades than do non-participants. Moreover, this relationship exists even when the effect of prior academic success is held constant, as indexed by the difference scores between the final course grades achieved by PASS participants and those achieved by non-participants, adjusted for Overall Admission Average. Although these results are encouraging, in Canada, comparisons between these difference scores and similar indices of the effect of PASS or SI programs on student academic success from other institutions is rendered difficult due to differences in methodologies (e.g., experimental design, statistical methods), the use of diverse grading systems (e.g., 4-point scale vs. 12-point scale), subjective grading practices and the lack of a centralized database (or published reports on the effectiveness of PASS-type programs).

Accordingly, it is recommended that efforts be made by PASS/SI researchers to streamline their methods of data collection and analysis so as to render comparisons between institutions (both within North America and internationally) more feasible and meaningful. Nonetheless, it should be underscored that these findings (indicating that PASS is effective in enhancing Carleton students' academic success) are consistent with the findings of numerous reports from a variety of institutions, mostly in the U.S., that have also investigated the effects of SI or PASS-like programs on their students' academic success.

Preliminary qualitative results also indicate that PASS may have additional indirect benefits for facilitators and, to a lesser degree, faculty/instructors. Although this study is not the first to indicate that this may be the case (see Couchman, 2009; Stout and McDaniel, 2006), there is a marked paucity of data concerning the potential benefits of PASS for these two groups, particularly on the Canadian SI/PASS landscape. As such, it is the recommendation of the authors that studies be conducted, especially in Ontario and Canada, with the express purpose of elucidating the impact of the PASS program on facilitator and faculty outcomes.
If at all possible, these research efforts should use similar methods to those employed in the present study, for two reasons. First, as evidenced by many of the findings in this report, a rich supply of data can be obtained by using the types of surveys employed in this study (see Appendices A, B and C), as these have been designed specifically to elicit informative responses from the relevant populations (i.e., students, facilitators and instructors). Secondly, the streamlining of research instruments, as alluded to previously regarding quantitative difference scores, will allow for meaningful comparison of results among institutions.

In addition to the above recommendations for future research studies, the authors suggest that comprehensive efforts be made to increase student attendance at PASS workshops and to demonstrate the benefits of the PASS program to faculty members. Further research studies

are warranted to ascertain the most effective and appropriate ways – as indicated by students, facilitators and faculty – of attaining this goal.

The collected data sets and the findings included in this report should provide useful information for advancing discussions among Canadian universities concerning the utility of various peer-assisted learning programs. These data sets and findings should be particularly useful for discussing the relative benefits of these various programs as well as for identifying important challenges faced by providers of these services, which need to be addressed in the future.

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