

**ASSESSING THE IMPACT OF SUPPLEMENTAL  
INSTRUCTION ON THE RETENTION OF  
UNDERGRADUATE STUDENTS AFTER  
CONTROLLING FOR MOTIVATION**

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**ABSTRACT**

The University of Ottawa (UofO) in Ottawa, Canada offers a formal supplemental instruction program, called the residence study group program (RSGP), to residence students registered in first year courses that are associated with a high degree of failure or attrition. The objective of this study was to assess the impact of this program by comparing a sample of first year residence students who participated in the RSGP with a sample who did not participate. The study compared final grades of students in these courses after controlling for personal motivation and found that while those who participated in the RSGP did not receive higher final grades than non-participants, they were more likely to persist in their studies. It appears that the RSGP contributes in many important ways to the academic and social integration of first year students and these are critical to persistence beyond the first year.

Students who enter post-secondary education with poor academic preparation (e.g., without requisite skills and knowledge), with poor prior performance (e.g., low high school Grade Point Average (GPA)), or with particular personal

characteristics (such as being a first-generation university student or being a student of low-socioeconomic status) may be more at risk for academic failure or early withdrawal from university (Choy, 2002; Pizzolato, 2003; Yeh, 2002). While prior preparation, background and personal characteristics can be associated with these negative outcomes, it is often the academic experience of the student in the first year of university studies that influences whether he or she continues past the first year regardless of his or her academic performance (Tinto, 1998). Specifically, as Pascarella and Terenzini (1983) report, “what happens to a student after arrival on campus may have greater impact on persistence than either the background characteristics or personal commitments to the institution and the goal of graduation brought to college” (p. 219).

In his discussion of the findings of some two decades of research on student retention, Tinto (1998) states that “one thing we know about persistence is that involvement matters. The more academically and socially involved individuals are—that is, the more they interact with other students and faculty—the more likely they are to persist” (p. 168). Tinto suggests that there are two forms of integration. The first, academic integration, is defined as “the development of a strong affiliation with the college academic environment both in the classroom and outside of class [and] includes interactions with faculty, academic staff, and peers but of an academic nature (e.g., peer tutoring, study groups)” (Nora, 1993, p. 235). The second, social integration, is defined as “the development of a strong affiliation with the college social environment both in the classroom and outside of class [and] includes interactions with faculty, academic staff, and peers but of a social nature (e.g., peer group interactions, informal contact with faculty, involvement in organizations)” (Nora, 1993, p. 237). According to Pascarella and Terenzini (1977, 1983) and Tinto (1998), the effect of integration on retention is most powerful when both forms of integration—academic and social—occur, but the two forms are also reciprocal (Pascarella & Terenzini, 1983; Stage, 1989) in that they act as a vehicle for integration in the other. Further, Tinto suggests that while the two forms of integration play different roles for different students in different contexts (e.g., for some students it is social integration that matters most while for others it is academic integration that is most critical to persistence), it is academic integration that is the more important of the two in terms of retention.

Among those activities that could have a positive impact on both the academic and social integration of first year students are peer-mentoring programs. Peer-mentoring is defined as a formal intervention where experienced undergraduate or graduate students provide guidance and support to new or faltering students to enable them to navigate through their college or university education. Peer-mentoring is based on traditional mentoring, where an older, more experienced person fills a career-related function (providing advice, support, and information related to task accomplishment, professional development, and career success) and a psychosocial function (providing emotional and psychological support)

(Kram, 1983). Peer-mentoring pairs mentors and mentees who are roughly equal in age, experience, and power (Angelique, Kyle, & Taylor, 2002) and peer-mentors do not tend to possess a vast experience base and age differential, compared to their protégés (Philon, 2005). While the similarity of age and experience of peer-mentors may limit their ability to provide career-enhancing support (because they have not yet had experience with their career), peer-mentors can nonetheless fulfill the immediate task function related to the requirements of post-secondary education (e.g., study skills, course selection, exam preparation, etc.).

In addition to providing information about resources and services of potential value to the mentee, peer-mentors may be able to “offer confirmation, emotional support, personal feedback, and friendship” to a greater degree than would traditional mentors (Angelique et al., 2002, p. 199). In fact, peer-mentors may have more success than professionals at connecting with struggling students, given that peer-mentors can draw “upon their own immediate experiences [and] . . . offer empathetic emotional support rather than just sympathetic support” (Angelique et al., 2002, p. 199). In support of this contention, Terrion and Leonard (in press) found in their study of the motivations of paid and unpaid peer-mentors that generativity, or the desire to guide young people, was a prime motivator for peer-mentors, with many citing their own challenges in first year university as a reason to want to help younger or newer students. Thus, it may be the proximity and similarity between the partners in the peer-mentoring relationship that build trust through the establishment of common ground between mentor and mentee and thus fulfill the psychosocial function.

Many universities and colleges have implemented some form of formal peer-mentoring program as part of their student support services (Jacobi, 1991; Johnson, 2002; Tinto, 1998). One model is the “study group” where the peer-mentor leads a group of mentees in reviewing and understanding course material. The study group, also known as “supplemental instruction” (SI) (Arendale, 1997; Hensen & Shelley, 2003), may be offered in university residences to student athletes, to specific groups such as international students, or to the student body at large as one of many student support services. Unlike programs that target at-risk students, SI targets difficult courses, is open to all students within the target population, and uses peer-assisted study sessions to supplement the lectures provided by the professor. The objective of supplemental instruction is to enhance student performance and reduce attrition in these difficult courses.

While the study group provides a useful forum for students to develop a greater understanding of course material, and thus serves the career-related function of mentoring (Kram, 1983), it also serves as a formal support group and thus fulfills the psychosocial function (Kram, 1983) by facilitating a relationship between the student and the mentor but also between the students themselves. As argued by Larance and Porter (2004), the support group provides a vehicle through which its members can forge new identities and relationships, reduce

isolation through identification with a reference group, and develop new behaviors. Through their interaction with the other students in the study group, participants establish trust, form relationships, share information and resources, and create a sense of belonging. Indeed, as Wuthnow (1994) points out, support groups can simply make their members feel that they are not alone and this can have important implications in terms of students' decisions about withdrawal from their studies when things get difficult. Sense of belonging, defined as a "subjective sense of affiliation and identification with the university community" (Hoffman, Richmond, Morrow, & Salomone, 2002-2003, p. 228), is the result of a student's integration into the academic and social spheres of his or her university and has critical ramifications for retention and withdrawal, particularly after the first year (Tinto, 1975, 1987).

Numerous studies have examined the impact of SI over the past 3 decades. Arendale (1997), in an overview of the SI model and review of studies measuring SI, found that the program has a positive effect on course grades, re-enrollment rates, and graduation rates across racial and ethnic groups. As an example, in their recent study of the impact of a voluntary SI program for students in entry-level biology, chemistry, mathematics, and physics courses at a large American university, Hensen and Shelley (2003) found that after controlling for students' pre-entry characteristics, those students who participated in SI had higher final course grades and fewer withdrawals than those who did not participate. In addition, these researchers found that participation in SI was not limited to high-achieving students (which would explain the higher final scores) but rather was utilized by students at all levels and that students with lower pre-entry characteristics achieved higher final course grades than those who did not participate.

Likewise, Collins (1982), Congos and Schoeps (1993), Gattis (2000), Lundberg (1990), Price and Rust (1995), and Sucher and Pardue (2008), in various studies on the impact of SI, found that SI participation had a significant impact on academic achievement and retention. In a qualitative dissertation on the impact of SI in Britain, Ashwin (1993) found benefits for those students who took advantage of the service and, similarly, Congos and Mack (2005), in their evaluation of the outcomes of an SI program for introductory chemistry courses, found that participants enjoyed higher final course grade averages, more final grades of A, B, and C and fewer grades of D or F, and fewer withdrawals. Sucher and Pardue found that the more SI sessions students attended, the higher their final mark, and that failures in the course dropped by 12% from one year to the next. Peterfreund, Rath, Xenos, and Bayliss (2007-2008), in their study of the impact of SI on science, engineering, technology, and mathematics courses at San Francisco State University, found positive impacts in terms of increased student achievement and progression through subsequent courses in a sequence, despite the lower academic indicators of the supplemental instruction participants.

Many theorists have acknowledged that controlling for motivation is central to understanding the impact of SI on academic outcomes because it is possible

that more motivated students join SI programs in order to improve their marks and, possibly, would have outperformed their less motivated peers who did attend the SI group with or without the benefit of this service. To address this, therefore, Blanc, DeBuhr, and Martin (1983) attempted to control for motivation by assigning students to a motivational control group of students who had expressed interest in attending SI sessions, but could not because of scheduling conflicts and, thus, the authors reasoned, had the same motivation levels as those who did, in fact, attend. These authors found higher levels of academic achievement in SI participants compared to non-SI participants. Likewise, in a recent study of the impact of a supplemental instruction program for an introductory calculus class, Fayowski and MacMillan (2008) used prior grade point average as a covariate to control for ability and motivation and found that the odds of success were 2.7 times greater for the SI participants than for those who did not participate in the program.

The literature indicates that supplemental instruction and study groups make a difference to those students who participate. What is unclear, despite attempts to address this issue, is whether students who achieve better grades after participating in support programs would have achieved these results regardless of the program because they were personally motivated to succeed. For example, in the case of Blanc, DeBuhr, and Martin's (1983) study, it is questionable whether the motivation of students who do not participate in a program in which they had indicated interest (but are unable to attend) is the same as the motivation of students who actually do attend the program. Likewise, it is not clear that using entrance GPA as a measure of motivation, as Fayowski and MacMillan (2008) do, is a valid approach because it assumes that prior academic performance is an indicator of motivation, but it may be a measure of a different variable altogether.

The questions remain: would students who participated in study groups have sought support or otherwise enhanced their learning and thus performance because they were more motivated than those who did not seek out this support service? In contrast, did those students who chose not to participate in SI lack sufficient motivation to succeed, regardless of available support services? These questions are important because tremendous resources are invested in peer-mentoring and supplemental instruction programs without a clear understanding of the impact of these services. While previous studies have attempted to control for motivation, we are aware of none that has controlled for this variable using validated motivation scales.

### **The Residence Study Group at the University of Ottawa**

As part of its commitment to the academic success of its students, the University of Ottawa (UofO) in Ontario, Canada, offers a residence study group program (RSGP) in the four conventional residences on campus. The purpose of this supplemental instruction program is to provide study groups where students can

meet once a week to discuss common first year courses that have been determined as “at-risk.” A course is defined as being “at risk” when 15% of the class or more have grades below “C” (C = 60-64.9%). The RSGP provides residents an opportunity to go over many of the important concepts presented in class and to learn study skills that will increase their chances of success, not only in their first year, but throughout their university career. The study groups are led by upper-year undergraduate students who have previously obtained a grade of B+ or higher in the course that they lead. Study group leaders receive ongoing training in peer-mentoring skills.

The RSGP appears to provide an important support forum for first year students in typically difficult courses. But what is its effect? The goal of this study thus was to assess the impact of the RSGP in terms of the academic achievement (GPA) and retention of first year residence students. It was hypothesized that students who participated in the RSGP would outperform and persist in their studies more than their peers who did not participate in the program. To control for personal motivation, a motivation survey was administered to all students registered in these courses at the outset of the semester. To test the hypothesis, the researchers conducted a quantitative assessment of the impact of the RSGP by comparing a sample of first year residence students registered in introductory chemistry, physics, math, or biology who participated in the RSGP with a sample who did not participate in the program. The study compared final grades and rate of withdrawal of students in these courses after controlling for personal motivation and other variables (including entrance GPA, gender, and age). Specifically, the following research questions were posed:

RQ1: What is the impact of the RSGP on the academic achievement of university students?

RQ2: What is the impact of the RSGP on the retention of university students?

## METHODS

### Procedures

In order to measure and thus control for the motivational levels between the two groups, the researchers attempted to assess the motivational levels of all 2,842 students (most of whom are first year students) living in the campus’s conventional residences. Subjects were approached by either the research coordinator or their Residence Advisor during a regularly-scheduled residence floor meeting before mid-term exams and invited to participate in a research study. The Research Coordinator or the Residence Advisor read the consent form and also provided a paper copy of the form for students to read themselves. Students were also made aware of the terms of a \$500 prize to be awarded to the

residence floor with the highest participation rate in completing the motivation survey. Students who were present at the meeting were given the option of not filling out the survey but still having their participation count toward the prize.

The Research Coordinator or Residence Advisor then distributed the Academic Motivation Scale (College Version) (Vallerand, Pelletier, Blais, Brière, Senécal, & Vallières, 1992, 1993) in either French or English, depending on the preference stated by the student (given that the UofO is a bilingual university where students may study in English, French, or both). This survey is composed of 28 items subdivided into seven subscales assessing three types of intrinsic motivation (intrinsic motivation to know, accomplishment, and experience stimulation), three types of extrinsic motivation (identified, introjected, and external regulation), and amotivation. A total of 709 completed surveys were received.

### Sample

Attendance lists from the weekly RSGP sessions were obtained from the Director of Housing at the end of the semester. In order to make use of the self-selection in the RSGP by the students themselves, students who had attended the Study Group at least twice, who were in first year, and who had entered the University of Ottawa via an Ontario Secondary institution (to minimize differences in pre-entry characteristics), and who were registered in either introductory biology, chemistry, or math were selected as experimental condition subjects. This sampling process resulted in a total of 92 subjects. To establish a control group, a random sample of 92 students was selected from among the 466 students who had completed the motivation scale, had come from secondary high schools in Ontario, were in first year, were registered in the same biology, chemistry, or math classes, and had not participated in the RSGP. As seen in Table 1, there are no statistically significant differences in terms of the means for admission average, thus demonstrating the equivalency of the two groups.

The RSGP attendance records show that 85% of participation in the program occurs immediately following the distribution of mid-term marks. In other words, few students attend prior to learning of their mid-term grades but the majority of participants begin to attend after this point in the semester. We were thus able to use midterm marks as a pretest and final marks as a posttest.

Table 1. Comparison of Admission Average

Category	Group	<i>N</i>	Mean	St. Dev.	<i>p</i> -Value
Admission Average	Control	92	84.64	6.720	0.100
	Experimental	92	86.17	5.710	



To ensure that motivation did not account for any differences that we might find between the two groups, this variable was controlled by comparing the scores on the motivational scales of each group. We found that, in all seven of the subscales, motivation levels of the experimental (study group) members and the control group members were not statistically significantly different (see Table 2). This told us that there was no difference in motivation between those who chose to participate and those who did not.

## RESULTS

To measure the effects of the study groups, in-class performance and student retention after the first year were evaluated. First, the effects of the study groups were measured using the final grades of the students in their respective courses. The differences in grades between mid-term examinations as well as the final examinations were taken into consideration for both experimental and control groups. Two paired *t*-tests were conducted to investigate if there were any significant differences between the experimental group and the control group. The results were inconclusive as no significant differences were noted. Specifically,

Table 2. Comparison of Motivation Levels

Category	Group	<i>N</i>	Mean	St. Dev.	<i>p</i> -Value
Intrinsic motivation – to know	Control	92	5.465	0.998	0.404
	Experimental	92	5.345	0.939	
Intrinsic motivation – accomplishment	Control	92	4.734	1.225	0.914
	Experimental	92	4.751	0.984	
Intrinsic motivation – experience stimulation	Control	92	3.483	1.420	0.792
	Experimental	92	3.432	1.190	
Extrinsic motivation – identified	Control	92	5.730	1.000	0.619
	Experimental	92	5.808	1.085	
Extrinsic motivation – introjected	Control	92	4.552	1.388	0.536
	Experimental	92	4.679	1.405	
Extrinsic motivation – external regulation	Control	92	5.319	1.295	0.515
	Experimental	92	5.182	1.547	
Amotivation	Control	92	1.696	1.097	0.780
	Experimental	92	1.649	1.142	



the average mid-term examination grade and the average final examination grade for the experimental group were of 5.21 and 5.64 respectively, with a difference of 0.43 ( $p$ -value = 0.214), whereas the average mid-term examination grade and the average final examination grade for the control group were of 4.71 and 5.00 respectively, with a difference of 0.29 ( $p$ -value = 0.373) (see Table 3).

To evaluate the retention of the students after the first year, a comparison between the number of students who did not reregister for their second year in the fall semester and those who reregistered in the university was done. A Chi square test was conducted to compare the experimental and control group results. The results showed that participants who were involved in the study groups were more likely to remain in university (78 students) than those in the control group (66 remained). As shown in Table 4, the Chi square test is significant (Chi-square = 4.60, prob = 0.0320).

### DISCUSSION

Interestingly, in contrast to the findings of numerous other studies cited above, and despite the objectives of the RSGP, participation in this program does not

Table 3. Comparison of Mid-Term and Final Grades

Group	Marks	<i>N</i>	Mean	St. Dev.	<i>p</i> -Value
Experimental	Mid-term	92	5.207	3.504	0.214
	Final mark	92	5.641	3.133	
Control	Mid-term	92	4.707	3.389	0.373
	Final mark	92	5.000	2.828	

Table 4. Chi Square Analysis:  
Retention of Experimental versus Control Group

Group	Attrition	Retention	Total
Control	26	66	92
Experimental	14	78	92
Total	40	144	184

  

Statistic	<i>DF</i>	Value	Prob
Chi-square	1	4.600	0.032

appear to make a difference to the final mark of students in at-risk classes who choose to participate. It may seem, then, that offering the RSGP is not worth the investment if improved academic performance is the goal of the program. On the other hand, if the goal of the program is to ensure that students become academically and socially integrated during their first year of university, and that the sense of belonging that is created through this integration process results in greater retention of these students, then our data show that the program is, in fact, effective. Thus, while there is no indication that participation in the RSGP has an impact upon the academic achievement of participants, the data do show the impact of the RSGP on the retention of first year residence students. What might it be about the study group program that would explain why students who did not participate were statistically significantly more likely to withdraw? In the following section we have reflected on possible explanations for the positive impact of the RSGP on retention and organized these into two key areas. The first relates to the academic integration impact of the RSGP and includes the supplemental instruction aspects of the RSGP, the communication between peer mentors and participants, and the demonstration and teaching of study skills. The second key area relates to the social integration impact of the RSGP and focuses on the development of a learning community generally and of the social capital of the participants specifically.

### **Impact of the RSGP on Academic Integration**

#### *Supplemental Instruction*

The objective of programs like the RSGP is to enhance the academic integration of undergraduates by having trained study group leaders provide extra help to students in at-risk courses through reviewing material covered in class (particularly problematic areas), answering questions, and providing feedback on homework and assignments. In addition, peer-mentors offer course-related information (e.g., what to study for an exam). These career-related mentoring functions have been shown in numerous studies to enhance self-confidence, particularly if they are offered in a personal/individualized format (see Arendale, 1997, for a review of the positive impact of supplemental instruction). Link (2003), argues that self-confidence, along with clearly defined goals and a sense of support, is critical to student retention. She suggests that it is self-efficacy, or confidence that one is able to accomplish a task, which contributes to retention, and that self-efficacy may be enhanced by positive feedback about the learning process and by introducing students to former students who have successfully completed a difficult course as role models.

Clearly, the RSGP both provides positive feedback about the learning process and positive role models, since the peer-mentors themselves are graduates of the very classes that are the focus of the study groups that they lead. These activities contribute to student academic integration, or “the development of a

strong affiliation with the college academic environment both in the classroom and outside of class” (Nora, 1993, p. 235) by helping students to understand, connect with, and feel more confident about course material.

#### *Communication between Study Group Leaders and Participants*

Since peer-mentors are bound to explain things differently from professors (using perhaps different language and examples, relating content to concepts that are familiar to their peers, giving hints or shortcuts that professors might not give) and from a different perspective (Tinto, 1997), supplemental instruction by peer-mentors can complement or clarify what the professor has discussed in class and thus further enhance the academic integration of participating students. In addition, since peer mentors are roughly the same age as the students they lead in the RSGP, they can be perceived as more approachable. As Amenkhienan and Kogan (2004) found in their research on success factors identified by engineering students, this can encourage students to ask questions that they may be unwilling or unable to ask in class (a particularly relevant finding for courses offered in the large-class format where even confident students can be intimidated). It may also lead to increased confidence to speak with the professor directly and/or to seek out other support services on campus, both of these activities enhance a student’s academic integration and have been found to contribute to persistence by first year students (Thomas, 2002).

#### *Study Skill Development*

For many students in first year university, simply establishing a systematic approach to studying (both keeping up with readings and homework and preparing for tests and exams) in university is a challenge. The RSGP leaders, as part of their job, discuss and provide feedback on study skills, exam preparation, and assignment completion and this may well be a student’s first exposure to this information in a methodical and personalized way at a time when they may be motivated to learn it (e.g., when faced with the challenge of an at-risk course). As Bean (1990) suggests, the development of skills related to academic success could translate into increased confidence about one’s own ability to succeed, and a greater sense of control over the outcome of one’s academic efforts and more positive attitudes about the practical value of education, thus enhancing academic integration and, ultimately, influencing persistence.

### **Impact of the RSGP on Social Integration**

#### *Development of a Learning Community*

Tinto (1997, 1998) argues that learning communities, or co-registration or block scheduling that enables students to take courses together, can be created in higher education and that these offer the opportunity for students to create their

own support groups, ultimately enhancing their social integration, because they spend time together outside the classroom interacting, studying, and discussing course material. While the RSGP is not a learning community in the sense that students do not co-register in blocks of classes together, as Tinto (1998) advocates, the RSGP does seem to foster learning communities because it “requires students to become actively involved with others in learning” outside of the classroom (Tinto, 1998, p. 170) and is composed of students taking at least some of the same courses together. The residence study group combines the strengths of peer mentoring (academic support and psychosocial support) with the benefits of the study group (active involvement with others in learning) to foster “shared knowledge” or “a shared, coherent educational experience” (Tinto, 1998, p. 171) and “shared knowing” or the chance to get to know other students “quickly and fairly intimately and in a way that is part and parcel of their academic experience” (Tinto, 1998, p. 171). As Tinto points out:

By asking students to construct knowledge together—to share the experience of learning as a community of learners—learning communities seek to involve students both socially and intellectually in ways that promote intellectual development as well as an appreciation for the many ways in which one’s own knowing is enhanced when other “voices” are part of that knowing. (p. 171)

Thus, it may well be, at least in part, that the RSGP cultivates social integration, or “the development of a strong affiliation with the college social environment both in the classroom and outside of class” (Nora, 1993, p. 237). Tinto (1997) suggests that the shared experience of participants in learning communities helps students to develop a support network that not only connects students to their peers but also engages them more fully in the academic life of their university or college. This connection, he argues, explains to a significant degree why some students persist in their studies while others, less integrated, withdraw.

#### *The Social Capital Gained by Participants*

As Amenkhienan and Kogan (2004) found in their study of engineering students’ perceptions of factors that influenced their academic success, study groups allowed students to work collaboratively with other students on difficult material and learn by teaching other students. These connections, which we could refer to as social capital, offer a tangible value that may explain the positive impact of the RSGP on retention.

There has been much discussion of the concept of social capital since it was introduced by Coleman (1988) as an extension of prior research on financial and human capital. While financial capital describes a family’s wealth or income and human capital is measured by parents’ education, Coleman (1988) defines

social capital by referring to its function, viewing it as a resource that can be drawn upon. Putnam (2000) refined the definition of social capital to include the norms of reciprocity and trustworthiness that exist in the social networks of individuals. He argues that the value of social networks lies in part in the “enforcement of positive standards” (p. 312) or the modeling of desirable values and effective practices. Putnam points to research, including that by Pascarella and Terenzini (1991) and Astin (1993, 1996), that suggests that “involvement in peer social networks are powerful predictors of college dropout rates and college success, even holding constant pre-collegiate factors, including aspirations” (p. 306). Furthermore, as Packard (2004-2005) suggests, mentoring is an important form of social capital for post-secondary students that can influence students’ decisions to remain in their program of study by linking them with more senior students, tutors, faculty members, and professionals and thus to the science community.

As Thomas (2002) points out, education is usually seen as a means to reduce the social exclusion of vulnerable or marginalized members of society. However, she continues, social exclusion can be experienced by students themselves within the university context (for example, if they do not have friends, if they lack family or other social support systems, if they experience financial difficulty) and their exclusion makes them more likely to withdraw. She argues that universities can support the development of social capital to help reduce social exclusion by establishing both formal and informal opportunities for students to interact with each other, with faculty members and their assistants, and with support service providers. By building the social capital of first year students, the RSGP seems to fulfill the need for social integration of these potentially vulnerable students.

### **Limitations**

It is necessary to acknowledge that the small sample size is a limitation. Future research could extend this study and attempt to use a larger sample. Future research could also examine the impact of leading the RSGP on the Residence Study Group leaders themselves. As Topping (1996) points out, the experience of peer tutoring provides important benefits to both tutor and tutee since, for the tutor, it offers the chance to learn through teaching. Further, we must acknowledge that because participants were not randomly assigned to experimental conditions, we cannot generalize beyond this particular program at this particular university. Nonetheless, the findings could hold interesting implications for practice at a variety of institutions of higher education.

### **Practical Applications**

The marked increase in study group participation after midterms would seem to indicate that the RSGP misses the opportunity of providing support and

supplemental instruction for the first half of the semester of residence students' first year of university. In order to increase the utilization of the RSGP, there would need to be an effort to increase student awareness about the existence and benefits of the program. Some solutions to the early-session slump in attendance would be to have class presentations made by professors along with small advertisements in the class syllabi during the first semester. It would need to be stated that the study groups are exclusively for students in residence, but the increased awareness to those targeted students could also lead to demand for study group programs outside residence, thereby increasing the positive effects of supplemental instruction on a much greater portion of the student population. This presumed demand for increased study group programs would foster the Tinto's Learning Community (1997, 1998). Another strategy would be to coordinate publicity with residence coordinators to increase awareness within the housing environment of the target audience. Specifically, posters, mail drops, or mention at regular floor meetings would allow for greater dissemination of the program.

Finally, collaboration with other support services on campus, such as writing help centers or mentoring centers, where students are voluntarily seeking help, would allow greater outreach to students who may be unaware of the RSGP. Ultimately, the key to increasing the positive results for students participating in the RSGP, or any study group program, is to ensure that students are informed of the programs and benefits earlier on in their academic careers by generating awareness via as many campus resources as possible.

## CONCLUSION

This evaluation of the impact of the RSGP on residence students registered in at-risk courses (those in which 15% of the class or more have grades below "C" (C = 60-64.9%) has provided important insights into the means by which students can succeed in difficult courses. While the data did not demonstrate that the RSGP had an impact on the academic achievement of those students who participated in comparison with those who did not, it did have an impact on perhaps an even more important outcome: the retention of students through difficult courses and the challenging first year of university. This outcome is a critical goal of any support program, in particular given that recent research shows that poor performance is rarely the reason for student withdrawal and that a perceived poor fit between student and institution tends to explain many withdrawals (Finnie & Qiu, 2009, p. 193).

It appears that the RSGP contributes in many important ways to the academic and social integration of first year students and this is critical to persistence beyond the first year. By controlling for motivation we have gained greater understanding of the utility of formal support programs—in particular in terms of student retention—and can conclude that the SI should be more widely

implemented so that students beyond the first year and beyond the residence may also benefit.

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