THE LEARNING ASSISTANCE REVIEW

Journal of the National College Learning Center Association

About *The Learning Assistance Review*

The Learning Assistance Review is an official publication of the National College Learning Center Association (NCLCA). NCLCA serves faculty, staff, and graduate students in the field of learning assistance at two- and four-year colleges, vocational and technical schools, and universities. All material published by *The Learning Assistance Review* is copyrighted by NCLCA and can be used only upon expressed written permission.

Editor
MICHAEL FRIZELL
Director, Student Learning Services
Bear CLAW (Center for Learning and Writing)
Missouri State University
Meyer Library, Room 112
901 South National Avenue
Springfield, MO 65897

Managing Editor
NICHOLE BENNETT-BEALER
Dean of Liberal Arts
Burlington County College
601 Pemberton Browns Mill Road
Pemberton NJ, 08068

Contents

Letter from the Editor

If you find yourself reading these words, know that they come from an honest place when I say that I am honored to find myself writing them. Seventeen years ago, I made a sudden and irrevocable decision that changed the trajectory of my professional life. After almost ten years working as a professional actor, I felt the need to settle into a profession that felt permanent. You've heard the cliché's spouted by performers, "The road is long and often lonely," or "The system is rigged. True talent often goes unnoticed while the lucky are elevated to stardom." I cared little for fame and was never lonely when surrounded by fellow actors. I felt worn down by the constant competition, the need to be "on" every waking moment, and the endless search for the next gig. I decided to plunge into the business world, so I moved to Springfield, Missouri, and soon found a job in sales for a proprietary college that promised "unlimited growth potential" and offered students certificates of completion in the "growing" fields of assisting dentists, answering phones, and servicing HVAC equipment.

Anyone that's worked in sales will tell you that there's a hollow moment when you sit at your desk, staring vacant at a box of leads you're expected to cold call, and think, "I don't know what I'm doing." That moment came eighteen months into my new "career." I put my head down on the desk, enjoying the cool feel of the industrial metal as I tried to dispel the claustrophobia created by my cubicle walls. With determination, I rose, walked down the hall to the president's office, and knocked. He thrust his index finger up to indicate I wait a moment as he finished typing his thought while thick fingers pecked at his keyboard. Finally, he said, "Come."

My intention was to ask his advice about how to overcome my doubts about the products I was selling and how to stoke the fires of enthusiasm I felt when performing or public speaking. I wanted to tell him that I wished to succeed, be promoted, and perhaps move into a position of authority. Instead, when he asked, "What can I do for you?" with the dismissive tone I was used to hearing from him, I said, "I hate you." That got his attention.

"Excuse me?" he said, finally looking at me. In that moment, I felt empowered, perhaps for the first time in eighteen months. I pressed forward.

"I hate you. I hate this job. I hate making cold calls. I think I…I think I need to take my vacation."

He leaned back in his leather chair, clearly shocked. "Perhaps you should just leave."

I heard myself say, "Well, yes, I should." Within minutes, I was placing a cardboard box containing what little belongings I used to adorn my Spartan office and folding a check for six weeks' pay into my pocket. I was free.

I drove around for a few hours, reflecting on my happiest moments. Being onstage was not a natural fit for me as I was painfully shy as a child, but I forced myself to learn the difficult craft. Each performance was a victory. The mentors, teachers, and coaches I met along my journey molded me and I decided I wanted to be counted among their numbers, but I possessed only a B.A. and an M.A. in theatre. To teach, I would need more education. Was it luck or fate that I found the head of the graduate program in English in her office at 5:30 p.m. the night before the university broke for Thanksgiving? I told her my story, handed her a copy of my transcript and asked, "Do I have enough Shakespeare class credits to be an English major?" That discussion led to a graduate assistantship. I found myself occupying the front of a classroom, assisting faculty with research, and writing. The assistantship led to a full-time teaching job, then to the directorship of the Writing Center, and to the development and co-direction of the Bear CLAW (Center for Learning and Writing). I've had the distinct privilege to teach for four departments, to present at national and international conferences, and to see my writing in print. The art of teaching is challenging, akin to performing in many ways and, though every teacher has that moment when, standing in front of a class, a little voice intones, "I don't know what I'm doing," I smile, knowing with assurance I'm exactly where I should be at this moment.

After training with my predecessor, Christine Reichert, who shaped and molded this journal, that thin voice is still there, but its plaintive attempt to shake me only drives me forward. "You're still teaching as the editor. Encourage the new writers to find their voice and push the experienced ones to give you more," she said with a smile and a hint of melancholy. Thanks, Christine. I will.

It is with great honor that I count myself among the writers you'll discover in this issue: Krista M. Storia, Michael Stebelton, Alan Craig, Donna R. Potacco, Peter Chen, Danielle Desroches, Daniel R. Chrisolm, Sandra De Young, Robert Longwell-Grice, Janine McIlheran, Mark Schroeder, Steve Scheele, Kimberly A. Bethea, Martin, Bonangue, Todd Cadwallader Olsker, Cathy Fernandez-Weston, Mark Filowitz, James Hershey, Hye Sun Moon, Chris Renne, Ed Sullivan, Sean Walker, and Rochelle Woods.

Enjoy!

Michael Frizell
Editor

Immigrant College Students' Academic Obstacles

KRISTA M. SORIA AND MICHAEL STEBLETON
UNIVERSITY OF MINNESOTA - TWIN CITIES

Abstract

Immigrant college student populations continue to grow on college campuses across the nation; yet, little is known about the experiences of immigrant students. This paper examines differences in perceived academic obstacles between immigrant students and non-immigrant students at six large, public research universities (n = 56,000). The researchers found that immigrant students reported greater obstacles to their academic success, including weak math and English skills, inadequate study skills, poor study behaviors, poor study environments, and poor mental health. Using the framework of academic self-efficacy, the researchers offer guidelines to higher education practitioners, including faculty, advisors, learning assistance center staff, and other student affairs professionals, to decrease the effects of academic obstacles on immigrant students and enhance their academic self-efficacy.

Current events related to immigrants and immigration continue to dominate the daily news cycle. The United States and other nations devote significant attenion to immigrant issues. Shifting demographics suggest that institutions of higher education will be impacted in the future as more prospective immigrant students pursue access to post-secondary opportunities. The United States receives the largest number of immigrants in the world, with over a million immigrants receiving legal permanent residence each year (Camarota, 2010). These immigrants and their children have a significant impact on the demographics of the United States population; for example, the latest census reported a 43% increase in the Hispanic population. Hispanics are currently the fastest growing segment of the United States population, accounting for over half of the total population growth (Humes, Jones & Roberto, 2011). According to the Center for Immigration Studies, 24.3 million immigrants were reported in 1995; that number grew to 31.8 million in 2001 and is currently at 37.6 million for 2010 (Camarota, 2010).

Based on these immigration trends, immigrant students will continue to pursue post-secondary education opportunities at many institutions. Figures from the National Center for Education Statistics (NCES) indicate that over 12% of the total undergraduate population is comprised of immigrant students (Kim, 2009); yet, there is a dearth of research on this area and scholarly literature related to some of the academic obstacles surrounding the educational experiences of immigrant students is still emerging for both documented and undocumented students (Gildersleeve & Ranero, 2010; Oritz & Hinojosa, 2010). Consequently, one of the goals of this study is to contribute to the emerging body of work regarding the experiences of immigrant college students who were born outside of the United States or whose parents were born outside of the United States. Little is known about some of the obstacles encountered by immigrant college students and this study was designed to elicit more information about immigrant students' perceived academic obstacles.

Research suggests that immigrants' college experiences are distinct from other student populations and deserve further scholarly inquiry (Erisman & Looney, 2007; Szelényi & Chang, 2002). As a result, this study examined a large-scale, multi-institutional survey to investigate the extent to which differences exist between immigrant and non-immigrant students with respect to their self-identified obstacles to academic success. With the assumption that students' confidence in their ability to be successful in academic tasks can help them to overcome these obstacles, this study uses the concept of academic self-efficacy to frame this research study and to understand how practitioners can help immigrant students to overcome obstacles to their academic achievement.

Academic Self-Efficacy

Academic self-efficacy refers to students' confidence in their ability to undertake academic tasks, including writing papers, studying for exams, and completing academic projects. In this study, researchers use the academic self-efficacy framework to understand some of the perceived academic obstacles facing undergraduate students, although students' academic self-efficacy is not directly measured or used in analysis. Academic self-efficacy is well-documented in scholarly research as being positively associated with students' performance (grades) in college (Brown, Lent, & Larkin, 1989; Elias & Loomis, 2000; Hackett, Betz, Casas, & Rocha-Singh, 1992; Multon, Brown, & Lent, 1991). Multon, Brown, and Lent (1991) conducted a meta-analysis of the associations between students' academic self-efficacy and their performance and persistence and found that between 11% and 14% of the variance in academic performance and persistence could be accounted for by an individual's academic self-efficacy beliefs. Torres and Solberg (2001) found a positive association between academic self-efficacy and the number of hours students spent studying. In fact, efficacy beliefs are thought to be so important to academics that Bandura (1997) stated, "Perceived self-efficacy is a better predictor of intellectual performance than skills alone" (p. 216).

Academic self-efficacy has its roots in Bandura's social learning theory (Bandura, 1977). Central to social learning theory is the hypothesis that self-efficacy beliefs help to determine the activities individuals will pursue, the effort they expend in pursuing those activities, how they will persevere in the face of challenges and obstacles, and their ability to cope with the demands associated with a chosen course. Some of the most influential sources of these beliefs include mastery (i.e., successful) experiences, which provide one with real-life evidence that he or she has what it takes to be successful (Bandura, 1997). A college student's prior performance can offer a reliable guide for assessing self-efficacy beliefs; for example, when a student has been successful, his or her self-efficacy beliefs are raised (Schunk & Ertmer, 2000; Zimmerman & Ringle, 1981). Bouffard-Bouchard (1990) and Cervone and Peake (1986) found that students in high self-efficacy conditions—those who received more positive feedback on their performance—set higher aspirations, showed greater strategic flexibility in the search for solutions, achieved higher performance, and were more accurate in evaluating the level of their performance than were students of equal ability who received less positive feedback.

Students who perceive more obstacles to their academic success may struggle in their academic performance; however, under the framework of academic self-efficacy, practitioners can strive to increase students' confidence in overcoming those obstacles. As the researchers are interested in determining whether immigrant students perceive different levels of academic obstacles, the research question is as follows: Are there significant differences between immigrant and non-immigrant students' perceptions of obstacles to their academic success?

Method Instrument

The Student Experience in the Research University (SERU) survey project is based at the Center for Studies of Higher Education (CSHE) and is administered by the Office of Student Research and Campus Surveys at the University of California-Berkeley. The Student Experience in the Research University (SERU)/Association of American Universities (AAU) Consortium is a collaborative project of faculty and institutional researchers with the intent of creating data sources geared toward policy-relevant analyses of the undergraduate experience within major research universities and promoting a culture of institutional self-improvement. Each SERU Consortium member administers a version of the SERU survey as an environmental census scan of their students.

The SERU survey sampling plan is a census scan of the undergraduate experience. All undergraduates enrolled during spring 2009 who were also enrolled at the end of the prior term are included in this web-based questionnaire, with the majority of communication with undergraduates occurring by electronic mail. The SERU survey contains nearly 600 individual items. Each student answers approximately 200 core questions and is randomly assigned one of four modules containing approximately 125 items focused specifically on a research theme. The core questions,

which focus on time use, evaluation of a student's major, campus climate and satisfaction, serve to highlight four thematic research areas: academic engagement, community and civic engagement, global knowledge and skills, and student life and development. The questions used in this analysis are derived from the student life and development module, which included questions relating to students' perceived academic obstacles. This module was randomly assigned to 20% of students.

Participants

The survey was administered in the spring of 2009 to 145,150 students across six large, public universities classified by the Carnegie Foundation as having very high research activity. The institutional level response rates varied from 26% to 69%, for an overall response rate of 39.97% (n = 58,017). Immigrant students, defined as students who were born outside of the United States or had parents born outside of the United States, comprised approximately 33.9% (n = 18,315) of our sample. In the survey, students were asked to identify whether their mothers or fathers were born in the United States or outside of the United States; further, students were also asked to identify when they came to the United States to live. Students who indicated that either they or their parents were born in the United States were classified as non-immigrants while all other students were classified as immigrants. Table 1 represents the demographic information associated with the immigrant and non-immigrant students in our reduced randomly-assigned sample. Within our sample, we observe that gender representation was nearly equal across both immigrant and non-immigrant groups; however, immigrant students had higher proportions of African American, Chicano-Latino, and Asian students as compared to the non-immigrant students. Immigrant students also had higher numbers of working-class, low-income, and first-generation students as compared to non-immigrant students.

Analysis

We began by analyzing whether there are statistically significant differences between immigrant students and non-immigrant students with regard to their perceived obstacles to academic success. For this analysis, we used an independent samples t-test with immigrant status as a between-subjects factor. We also calculated the t-statistic, which measures the mean differences relative to the variability in each sample and the likelihood that the differences are due to chance alone, and Cohen's d effect sizes, which conveys the estimated magnitude of the differences.

Table 1

Frequency of Demographic Variables

Variables	Non-Immigrant Students		Immigrant Students	
	n	%	*n*	%
Male	3198	41.9	1719	42.4
Female	4425	58.1	2333	57.6
American Indian/Alaskan Native	63	.8	5	.1
African American	398	5.2	280	6.9
Chicano-Latino	251	3.3	672	16.6
Asian	150	2	1983	48.9
White	6421	84.2	853	21
Other/Unknown	346	4.5	261	6.5
Wealthy	202	2.6	81	2
Upper-Middle or Professional-Middle Class	2786	36.6	970	24
Middle Class	3243	42.6	1646	40.7
Working Class	1123	14.7	974	24.1
Low Income	262	3.4	378	9.3
First-Generation	1817	24.6	1209	30
Non-First-Generation	5722	75.4	2819	70

Note. Total numbers in categories are not equal due to non-response on items.

Results

The findings suggest statistically significant ($p < .05$) differences between immigrant and non-immigrant students in several areas. In regards to competing responsibilities, immigrant students are more likely to report higher instances of family responsibilities as an obstacle to their academic success as compared to non-immigrant students. Additionally, immigrant students are significantly ($p < .05$) more likely than non-immigrant students to report that weak math and English skills are obstacles to their academic success. There were no differences between immigrant and non-immigrant students with respect to employment or "other" responsibilities (e.g. athletics, clubs, or internships) impeding their academic success (Table 2).

The data also suggest that immigrant students are significantly more likely than non-immigrant students to report areas including lack of study skills, poor study behaviors, and poor study environments as impediments to their academic success. For example, immigrant students reported having more inadequate study skills (e.g. knowing how to start, knowing how to get help, or organizing material), poor study behaviors (e.g. waiting until the last minute, being easily distracted, spending too much time in social areas, or surfing too much on the web), and bad study environments (e.g. having a noisy roommate, poor internet access, or inadequate computers or software) as compared to non-immigrant students.

Finally, the data suggest that immigrant students were more likely to indicate that feeling stressed, depressed, or upset served as obstacles to their academic success than non-immigrant students. There were no observed differences with respect to students' physical illnesses or conditions that impeded their academic successes. The size of the effects in most cases was relatively small, although competing family responsibilities ($d = 0.239$), weak English skills ($d = 0.341$), and inadequate study skills ($d = 0.213$) had more modest effect sizes, suggesting that these differences were among the larger differences observed in the two groups.

Discussion and Implications for Practice

The data suggest that immigrant students are significantly more likely than non-immigrant students to believe that specific obstacles stand in the way of their academic achievements, including family responsibilities, weak English and math skills, study skills, study behaviors, and study environments. Furthermore, the data suggest that immigrant students are more likely than non-immigrant students to indicate mental health concerns as obstacles to their academic success. As discussed previously, academic self-efficacy can help students to persevere and overcome obstacles to their academic achievement; subsequently, there are several steps that practitioners—including learning assistance center professionals, developmental educators, and others—can take to help students to increase their academic self-efficacy (Jakubowski, 2004).

Table 2

Differences between Immigrant and Non-Immigrant Students' Obstacles to Academic Success

	Immigrant Students		Non-Immigrant Students		t	d
	n	M (SD)	n	M (SD)		
Competing job responsibilities (i.e. paid employment)	405	2.22 (1.29)	796	2.18 (1.26)	1.66	0.031
Competing family responsibilities	404	2.51 (1.19)	795	2.24 (1.07)	12.63**	0.239
Other competing responsibilities (e.g. athletics, clubs, internships)	405	2.58 (1.16)	795	2.55 (1.11)	1.49	0.026
Weak English skills	404	1.42 (0.86)	796	1.17 (0.58)	18.66**	0.341
Weak math skills	402	1.73 (1.01)	793	1.60 (0.91)	7.49**	0.135
Inadequate study skills (e.g. knowing how to start, knowing how to get help, organizing material)	404	2.41 (1.12)	794	2.18 (1.04)	11.19**	0.213
Poor study behaviours (e.g. wait until the last minute, easily distracted, too much social time, too much web surfing)	404	3.03 (1.16)	794	2.87 (1.12)	7.14**	0.140
Bad study environment (e.g. noisy roommate, poor internet access, inadequate computer or software)	403	2.64 (1.08)	794	2.54 (1.03)	4.90**	0.095
Feeling depressed, stressed, or upset	404	2.80 (1.12)	796	2.71 (1.09)	4.10**	0.081
Physical illness or condition	405	2.03 (0.92)	797	2.00 (0.91)	1.63	0.033

Note. ***p < .001

Scale: 1-5, ("not at all" to "all the time")

First, practitioners are encouraged to initiate honest conversations with immigrant college students about their study environments. Are they working in a physical space that is conducive to productive study efforts? Many immigrant students live with their families and commute to campus. In these cases, some immigrant students may find it difficult to successfully complete academic work at home due to family distractions or family responsibilities. Many immigrants are first-generation students (Vuong, Brown-Welty, & Tracz, 2010) and, if they are the first in their families to pursue higher education, well-intentioned parents may not understand the demands of college-level work (i.e., they may question why students need to complete school work in the evenings and weekends) (Jehangir, 2009). Staff in learning assistance centers and developmental educators can encourage immigrant students to seek out study spaces on campus or in the university/college community. Students may not be aware of the resources, including extended weekend and evening study hours, which are available to them.

Second, immigrant students often have multiple family responsibilities especially if they live at home. These familial tasks may often interfere with academic work as well as academic self-efficacy and career decision-making (Ma & Yeh, 2010; Stebleton, 2007). Pending cultural traditions and expectations, these family expectations often fall on the shoulders of female immigrant students or older siblings. Educators may opt to initiate conversations with immigrant students about home and school balance issues. Issues and skill development related to time management, goal setting, and negotiation may be valuable discussion topics.

Third, based on the results, immigrant college students may perceive obstacles such as poor study behaviors and skills. Learning assistance center staff, academic advisors, and other educators are in an ideal position to address these concerns. For example, most colleges and universities offer study skills courses and/or life-planning skills development options. Furthermore, practitioners in learning assistance centers or tutorial services can provide ongoing workshops to address concerns related to study habits (Cole & Denzine, 2004; Reinheimer & McKenzie, 2011). Immigrant college students can be advised of these opportunities and encouraged to attend. Ideally, students will feel more confident with their abilities as they develop these important college survival skills.

Fourth, issues related to mental health and counseling needs can be sensitive topics, perhaps even more so with immigrant college students. Often immigrants will not seek out traditional mental health services or professional counseling help (Ogbu & Simons, 1998; Omizo, Kim, & Abel, 2008). Again, depending on cultural norms and expectations, many immigrants will opt to seek out support from family and community resources, or rely on their religious beliefs and practices (Constantine, Myers, Kindaichi, & Moore, 2004; Winograd & Tryon, 2009). Often, students may not even be aware of mental health resources on their campus (Stebleton, Soria, & Huesman, in press). Instructors,

advisors, and tutors again are in an ideal position to help immigrant students (and all students for that matter) to be more informed about the resources available both on and off campus. For instance, some students may opt to utilize counseling services in the community rather than the student health center or counseling office. Other barriers to the use of services include concerns about confidentiality, access to location and hours, questions about insurance, and myths about the purpose and stereotypes of using counseling services (Loya, Reddy, & Hinshaw, 2010). Practitioners, including advisors, faculty, and student affairs staff, can help educate students about misperceptions and serve as brokers of services, referring students in need to the array of services that might be available on respective campuses.

Finally, low self-efficacy beliefs around math and English abilities may serve as significant barriers to success (DelliCarpini, 2011). This can be especially challenging when new immigrant students are faced with completing multiple courses in developmental Math and English; often these courses do not bear any college-level credit that can be used toward graduation. Students who begin at the 2-year community college are frequently reuired to take several ESL or ELL classes in order to develop stronger English communication skills. Students need to be aware that there are resources on campus (e.g., individual tutoring, study groups, and office hours) that will help them succeed in these important courses. Professionals who are employed in student affairs offices or academic learning centers might explore the use of peer mentoring programs or other targeted initiatives that will help students to develop stronger academic self-efficacy and become more successful in academic coursework that eventually will lead to degree completion (Gloria, 2010).

There are other institutional efforts that colleges and universities can implement to help address the self-efficacy issues and other needs of immigrant college students. Learning assistance center staff and other student affairs practitioners may opt to take lead roles on some of these initiatives (Blake, 2007; Stuart Hunter & Murray, 2007). Examples include getting involved with first-year experiences such as freshmen seminars, collaborating with faculty and instructional staff in living-learning communities, teaching or co-teaching a college success course, and seeking out involvement opportunities in other high impact educational practices that often lead to student engagement and success (Kuh, 2008). Ramos-Sanchez and Nichols (2007) noted that the transitional needs of students are often not met by traditional support services offered by the university, so they suggested interventions that focus primarily on increasing self-efficacy to build student confidence related to perceptions of academic ability. Self-efficacy beliefs are malleable (Bouffard-Bouchard, 1990); therefore, helping students to increase their academic self-efficacy may increase their motivation to persist and become successful in their academic pursuits. College staff members—including learning center staff, peer advisors and mentors, student affairs staff, faculty advisors, and academic/staff advisors—can reach

out to provide the necessary support and encouragement to facilitate increased academic self-efficacy among immigrant students in college. Several examples of ways that staff and faculty can assist immigrant college students with building their academic self-efficacy follow.

Garing (1993) has recommended several key times during which it is critical for college advisors to reach out and contact students, starting within the first three weeks of the semester, when students are beginning to feel more comfortable about asking questions and have a clearer understanding of course requirements. Intrusive advising at this stage is important, so advisors can proactively address any perceived problem areas and provide relevant information regarding campus services; this is also a great time to provide positive feedback for immigrant students regarding their progress. Garing (1993) also suggested that advisors meet with students during their sixth week of courses, a time when students will have already undertaken the challenge of at least one major examination and can begin to project their academic progress—this is also a great time to reinforce academic accomplishments. Finally, Garing recommended that advisors reach out to students between semesters—a time when "students tend to disappear…due to family pressures, changes in work, or perceived changes in their career goals" (1993, p. 103). Developing frequent and regular advising conversations can support immigrant students at these crucial stages—especially during their first year, when advising staff can initiate regular communications with new students.

Feedback from faculty members can also reinforce immigrant students' successes. Researchers have long recognized the importance of student-faculty contact in student retention. Chickering and Gamson (1987) noted that student-faculty interactions in and out of classes are the "most important factor in student motivation and involvement" (p. 3). Research has shown that faculty-student interactions, mentorship, and academic advising—all modes of academic and social integration— appear to be highly integral to college student development and achievement. As one means of facilitating student-faculty interactions, faculty advising has been shown to "positively influence students' degree aspirations, self-efficacy and esteem, academic success, satisfaction, goal development, and adjustment to college" (Chang, 2005, p. 770). In a frequently cited study of student retention, Astin (1993) concluded that "next to peer group, the faculty represents the most significant aspect of the student's undergraduate development" (p. 410). As faculty are directly involved in reviewing students' work, they are key players in helping students to increase their academic self-efficacy.

Studies of first-year students have also confirmed that faculty-student contact is an influential factor in student achievement, persistence, academic skill development, and personal development (McArthur, 2005). According to King (1993), academic advisement and the role faculty play in its delivery is the most critical service available for college

students. Light (2001) concluded that "students who get the most out of college, grow the most academically, and [those] who are the happiest, organize their time to include activities with faculty members" (p. 10). The reasons for such potent influence are better understood when considering instructors' multiple roles as educators, role models, employers, advisors, and sources of support and guidance (Chang, 2005); consequently, immigrant students have a lot to gain from faculty interactions.

Although many immigrant students may not participate in co-curricular school activities due to their family obligations, colleges can create positive experiences within the classroom that can encourage persistence. Students who are actively involved with peers, faculty, and staff—especially in learning activities—are more likely to learn, persist, and graduate. The focus on the classroom is important, as many retention theories are focused on the creation of learning communities or cohorts as a means to help students develop academic and social connections with peers and faculty (Ellertson & Thoennes, 2007; Lardner & Malnarich, 2008). Taylor, Moore, MacGregor, and Limblad (2003) have concluded that "a preponderance of studies indicate that learning communities strengthen student retention and academic achievement" (p. iii). Among the many well-documented benefits of learning communities are that they organize students and faculty into smaller groups, encourage integration of the curriculum, help students to be socialized to the expectations of college or specific disciplines, and offer a community-based delivery of academic support programs (Shapiro & Levine, 1999). These are all conditions that can foster positive academic self-efficacy among immigrant students. Immigrant students can be encouraged to actively participate in these types of high impact educational practices (e.g., learning communities, study abroad, service learning, directed research with faculty, and others) (Kuh, 2008).

Limitations and Suggestions for Future Research

The generalizability of this study is limited because it explores immigrant students at a single institutional type—large, public research universities; as a result, further work on immigrant students to include multiple institutional types is recommended. Additionally, while the purpose of this study is to examine differences between immigrant and non-immigrant students only, future studies could control for possible confounding variables such as gender or socioeconomic status. Further, we grouped all immigrant students together when clearly students of different racial and ethnic backgrounds have different experiences on college campuses; consequently, future studies are encouraged to explore differences between different racial and ethnic immigrant groups.

Additionally, the SERU is a census survey that relies solely on self-reported student data. Porter (2009) outlined and critiqued the challenges of interpreting self-reported student data on surveys that purport to understand student behaviors and measures. Porter's critique focused on

the NSSE instrument; however, the premise can be applied to all student surveys that rely on self-reported behaviors. In addition to positivistic approaches to understanding immigrant experiences, the researchers for this study advocate for rigorous interpretive studies through the use of narrative, photoethnography, the qualitative research practice of capturing visual images that depict the experiences of college students' lives, and other non-traditional approaches to better understand student development (Evans, Forney, Guido, Patton, & Renn, 2010).

While recognizing the complexity of immigrant students' identities and the unique experiences of each individual student; the intention of this paper is to shed light on only the differences in perceived academic obstacles between immigrant and non-immigrant students. Stebleton, Huesman, and Kuzhabekova (2010) have noted important differences between different generations of immigrant students based on when they arrived in the United States; to that end, we encourage future studies to take into account such factors in exploring the experiences of immigrant students. Finally, we advocate longitudinal research to examine the impacts of these self-perceived obstacles on immigrant students' academic successes and the extent to which academic self-efficacy can moderate those impacts. Learning which educational practices best influence academic self-efficacy can also help higher education administrators with deciding upon the most effective practices to engage immigrant students and help them to overcome obstacles to their success.

Conclusion

In conclusion, immigrant students are more likely to report that they have greater obstacles to their academic success than non-immigrant students. Specifically, immigrant students were more likely to cite competing family responsibilities, weak English skills, weak math skills, inadequate study skills, poor study behaviors, poor study environments, and feeling depressed, stressed, or upset as obstacles to their academic success. These findings have implications for higher educational professionals in learning centers, as immigrant college student populations will continue to grow. Further, the obstacles to their academic success that immigrant students encounter may have serious implications for their degree progression and attainment over time. In this article, several recommendations have been presented which student affairs practitioners and other educators, including learning assistance center staff, can take to enhance immigrant students' academic self-efficacy and help them to overcome academic obstacles.

References

Astin, A. W. (1993). *What matters in college? Four critical years revisited.* San Francisco, CA: Jossey-Bass.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*, 191-215.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: W. H. Freeman.

Blake, J. H. (2007). The crucial role of student affairs professionals in the learning process. In E.L. Moore (Ed.), *Special issue: Student affairs staff as teachers* (pp. 65-72). New Directions for Student Services, No. 117. San Francisco, CA: Jossey-Bass.

Bouffard-Bouchard, T. (1990). Influence of self-efficacy onperformance in a cognitive task. *Journal of Social Psychology, 130*, 353-363.*

Brown, S. D., Lent, R. W., and Larkin, K. C. (1989). Self-efficacy as a moderator of scholastic aptitude: Academic performance relationships. *Journal of Vocational Behavior 35*(1): 64–75.

Camarota, S. (November, 2010). *Immigration and Economic Stagnation: An Examination of Trends 2000 to 2010*. Retrieved from Center for Immigration Studies http://www.cis.org/highest-decade.

Cervone, D., & Peake, P. K. (1986). Anchoring, efficacy, and action: The influence of judgmental heuristics on self-efficacy judgments and behavior. *Journal of Personality and Social Psychology, 50,* 492-501.

Chang, J. C. (2005). Faculty student interaction at the community college: A focus on students of color. *Research in Higher Education, 46*(7), 769-802.

Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *American Association for Higher Education, 3*, 2-8.

Cole, J. S., & Denzine, G. M. (2004). I'm not doing as well in this class as I'd like to: Exploring achievement motivation and personality. *Journal of College Reading and Learning, 34*(2), 29-44.

Constantine, M. G., Myers, L. J., Kindaichi, M., & Moore, J. L. (2004). Exploring indigenous mental health practices: The roles of healers and helpers in promoting well-being in people of color. *Counseling & Values, 48*, 110-125.

DelliCarpini, M. (2011). Supporting ELLs before, during, and after reading. *English Journal, 100*, 108-112.

Elias, S. M., & Loomis, R. J. (2000). Using an academic self-efficacy scale to address university major persistence. *Journal of College Student Development*, *41*, 450–454.

Ellertson, S., & Thoennes, K. V. (2007). Reframing teaching and learning: Lessons from learning communities for student affairs. In E.L. Moore (Ed.), *Special issue: Student affairs staff as teachers* (pp. 35-46). New Directions for Student Services, No. 117. San Francisco, CA: Jossey-Bass.

Erisman, W., and Looney, S. (2007*). Opening the door to the American dream: Increasing higher education access and success for immigrants*. Washington, DC: The Institute for Higher Education Policy.

Evans, N. J., Forney, D. S., Guido, F. M., Patton, L. D., & Renn, K. A. (2010). *Student development in college: Theory, research, and practice* (2 ed.). San Francisco, CA: Jossey-Bass

Garing, M. T. (1993). Academic advising: Organizing and delivering services for student success. *New Directions for Community Colleges, 82*, 97-105.

Gildersleeve, R. E., & Ranero, J. J. (2010). Precollege contexts of undocumented students: Implications for student affairs professionals. In J. Price (Ed.), *Special issue: Understanding and supporting undocumented students* (pp. 19-33). New Directions for Student Services*, No. 131. San Francisco, CA: Jossey-Bass.

Gloria, C. (2010). The impact of mentoring on the success of community college students. *The Review of Higher Education, 34*, 39-60.

Hackett, G., Betz, N. E., Casas, J. M., & Rocha-Singh, I. A. (1992). Gender, ethnicity, and social cognitive factors predicting the academic achievement of students in engineering. *Journal of Counseling Psychology 39*, 527–538.

Humes, K., Jones, N. & Roberto,R. (March, 2011). *Overview of Race and Hispanic Origin: 2010 U.S. Census Brief.* Retrieved July 18, 2011 from http://www.census.gov/prod/cen2010/briefs/c2010br-02.pdf.

Kim, E. (2009). Navigating college life: The role of student networks in first year adaptation college adaptation experience of minority immigrant students. *Journal of the First Year Experience and Students in Transition, 21*(2), 9-34.

King, M. (1993). Academic advising, retention, and transfer. In M. King (Ed.), *Academic advising: Organizing and delivering services for student success* (pp. 21-31). *New Directions for Community Colleges, 82*. San Francisco, CA: Jossey-Bass.

Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges and Universities.

Jakubowski, T. G. (2004). The relationship of self-efficacy, identity style, and stage of change with academic self-regulation. *Journal of College Reading and Learning, 35*(1), 7-24.

Jehangir, R. (2009). Cultivating voice: First-generation students seek full academic citizenship in multicultural learning communities. *Innovative Higher Education, 34*(1), 33-49.

Lardner, E., & Malnarich, G. (2008). A new era in learning: Why the pedagogy of intentional integration matters. *Change, 40*(4), 30-37.

Light, R. J. (2001). *Making the most of college: Students speak their minds.* Cambridge, MA: Harvard University Press.

Loya, F., Reddy, R., & Hinshaw, S. P. (2010). Mental illness stigma as a mediator of differences in Caucasian and South Asian college students' attitudes toward psychological counseling. *Journal of Counseling Psychology, 54*, 484-490.

Ma, P.-W. W., & Yeh, C. J. (2010). Individual and familial factors influencing the educational and career plans of Chinese immigrant youths. *Career Development Quarterly, 58*, 230-245.

McArthur, R.C. (2005). Faculty-based advising: An important factor in community college retention. *Community College Review, 32*(4), 1-19.

Multon, K. D., Brown, S. D., & Lent, R. W. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology 38*(1): 30–38.

Ogbu, J. U., & Simons, H. D. (1998). Voluntary and involuntary minorities: A cultural-ecological theory of school performance with some implications for education. *Anthropology & Education Quarterly, 29*, 155-188.

Omizo, M. M., Kim, B. S. K., & Abel, N. R. (2008). Asian and European American cultural values, bicultural competence, and attitudes toward seeking professional psychological help among Asian American adolescents. *Journal of Multicultural Counseling & Development, 36*, 15-28.

Ortiz, A. M., & Hinojosa, A. (2010). Tenuous options: The career development process for undocumented students.   In J. Price (Ed.), *Special issue: Understanding and supporting undocumented students* (pp. 53-65). New Directions for Student Services*,* No. 131. San Francisco, CA: Jossey-Bass.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research* (3rd ed.)*.* San Francisco, CA: Jossey-Bass.

Porter, S. (2009). *Do college student surveys have any validity?* Paper presented at the Association for the Study of Higher Education, Vancouver, BC.

Ramos-Sanchez, L., & Nichols, L. (2007). Self-efficacy of first generation and non-first-generation college students: The relationship with academic performance and college adjustment. *Journal of College Counseling, 10*, 6-18.

Reinheimer, D., & McKenzie, K. (2011). The impact of tutoring on the academic success of undeclared students. *Journal of College Reading and Learning, 41*(2), 22-36.

Shapiro, N. S., & Levine, J. H. (1999). *Creating learning communities: A practical guide to winning support, organizing for change, and implementing programs.* San Francisco, CA: Jossey-Bass.

Schunk, D. H., & Ertmer, P. A. (2000). Self-regulation and academic learning: Self-efficacy enhancing interventions. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 631–649). New York, NY: Academic Press.

Stebleton, M. J. (2007). Career counseling with African immigrant college students: Theoretical approaches and implications for practice. *Career Development Quarterly, 55*, 290-312.

Stebleton, M. J., Huesman, R. L., Jr., & Kuzhabekova, A. (2010). *Do I belong Here? Exploring immigrant college student responses on the SERU survey Sense of Belonging/Satisfaction factor.* CSHE Research and Occasional Paper Series 13.10. Berkeley, CA: University of California-Berkeley, Center for Studies in Higher Education. Retrieved August 12, 2011, fromhttp://cshe.berkeley.edu/publications/docs/ROPS.Stebleton20et20al.ImmigrantStudents.9.14.10.pdf.

Stebleton, M. J., Soria, K. M., & Huesman, R. L., Jr. (in press). First-generation students' sense of belonging, mental health status, and use of counseling services at research universities. *Journal of College Counseling*.

Stuart Hunter, M., & Murray, K. A. (2007). New frontiers for student affairs professionals: Teaching and the first-year experience. In E.L. Moore (Ed.), *Special issue: Student affairs staff as teachers* (pp. 25-34). New Directions for Student Services, No. 117. San Francisco, CA: Jossey-Bass.

Szelényi, K., and Chang, J.C. (2002). Educating immigrants: A community college role. *Community College Review, 32*, 55-73.

Taylor, K., Moore, W. S., MacGregor, J., & Limblad, J. (2003). *Learning community research and assessment: What we know now.* National Learning Communities Project Monograph Series. Olympia, WA: The Evergreen State College, 192, Washington Center for Improving the Quality of Undergraduate Education, in cooperation with the American Association for Higher Education.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed). Chicago, IL: University of Chicago Press.

Vuong, M., Brown-Welty, S., & Tracz, S. (2010). The effects of self-efficacy on academic success of first-generation college sophomore students. *Journal of College Student Development, 51*, 50-64.

Winograd, G., & Tryon, G. S. (2009). Counseling expectations among students in an opportunity program: Dispositional and cultural influences. *Journal of Counseling & Development, 87*, 438-448.

Zimmerman, B. J., & Ringle, J. (1981). Effects of model persistence and statements of confidence on children's self-efficacy and problem solving. *Journal of Educational Psychology*, *73*, 485–493.

BOOK REVIEW:
Access at the Crossroads:
Learning Assistance in Higher Education

Arendale, D. R. (2010). Access at the crossroads: Learning
assistance in higher education. *ASHE Higher Education Report,
35*(6). San Francisco, CA: Jossey-Bass.

REVIEWED BY ALAN CRAIG
GEORGIA PERIMETER COLLEGE

David Arendale, a preeminent practitioner and researcher in
the field of learning assistance and a Fellow of the Council of
Learning Assistance and Developmental Education Associations,
has written an important book that I recommend everyone in the
field read—and then give copies to campus leaders to initiate or
continue a campus-wide dialogue on the importance and impact of
learning assistance to the success of students and to the institution
itself. What comprises the field of learning assistance? In Arendale's
parlance, the phrase includes a broad array of efforts to bolster
learning in higher education including learning centers, developmental
education, tutoring, supplemental instruction, computerized learning
resources, student success workshops, and related offerings.

Arendale placed learning assistance "at the confluence of academic
affairs, student affairs, and enrollment management" (p. 4)—hence, at
the crossroads of higher education. This is a position, he noted, with the
potential for both great benefit to students and significant controversy
in the institution. After introducing the subject, Arendale addressed
key questions about learning assistance: Who belongs in college? Why
should taxpayers pay twice for something students should have already
learned? Why do we need learning assistance? How are equity issues
and students' civil rights impacted by the provision or absence of learning
assistance in the institution? Why does learning assistance not figure more
prominently in the histories of higher education? Arendale's responses
to these questions and related discussions are particularly well done.

In his third chapter, Arendale described his historical model of six phases
of learning assistance. Each phase is characterized by both the particular
learning assistance efforts most commonly employed at the time and by
students served. These efforts ranged from tutoring during the colonial
era, to preparatory departments in the mid-to-late 1800s, to remedial,

For more information contact: Alan Craig | GPC Learning & Tutoring Center | Georgia
Perimeter College Dunwoody Campus | 2101 Womack Raod | Dunwoody, GA 30338-4445 |
Email Alan.Craig@gpc.edu

compensatory, and developmental education efforts from 1870 to 1990, to current access and enrichment programs. Many historians of higher education give little space to learning assistance in their texts. This is compounded by the fact that, often, learning assistance professionals themselves are unaware of the long and rich history of the field. As Arendale noted, this lack of knowledge and understanding of the "historic importance" (p. 9) of learning assistance contributes to the devaluation of the field and ultimately the elimination of learning assistance programs.

Arendale's focus on the historical importance of learning assistance is one I share. If anything, Arendale's model does not go far enough in highlighting the early days of learning assistance. The two earliest state universities (both have a claim on being first), the University of North Carolina and the University of Georgia, had preparatory departments much earlier than Arendale's model allows. Indeed, in the colonial era, the College of William and Mary followed the Scottish university tradition rather than that of Oxford or Cambridge, maintaining a preparatory grammar school so that underprepared students could learn Latin and Greek grammar (Cutts, 1935).

In the next chapter, Arendale described the current state of learning assistance. In the first part of the chapter, he examined estimates of the number of students who use learning assistance services each year and the costs of providing those services. In the second part of the chapter, Arendale reviewed the wide variety of approaches to learning assistance by categorizing them into those that support gaining needed knowledge and skills

- prior to taking college-level classes (e.g., summer bridge programs, remedial courses, and developmental courses),

- concurrently with college-level classes (e.g., learning centers, tutoring, and peer learning groups), or

- through an external source (e.g., moving support out of the institution to high schools, community colleges, or commercial vendors).

Arendale noted that outsourcing was not only for developmental courses but also for other forms of learning assistance such as tutoring. In the third part of the chapter, Arendale presented an updated version of Keimig's hierarchical model of learning assistance, ranging from the lowest level of "isolated development of remedial skills" (p. 82) (e.g., study skills workshops) to the highest level of "an embedded and comprehensive learning assistance system" (p. 81) (e.g., implementation of Universal Instructional Design in a course). This chapter could have been strengthened by a review of the extensive work on basic skills undertaken by the California Community Colleges (Boroch et al., 2010).

Next, Arendale reviewed and categorized learning assistance best practices. He began by drawing the reader's attention to a few educational theories or pedagogies that have proven useful in framing best practices. These included situated cognition, metacognition, Universal Instructional Design, Astin's talent development model, and multiculturalism. Although Arendale noted that his list was only a sample of emerging pedagogies, a useful and powerful approach that I wish he had added is *culturally responsive teaching*, a model particularly relevant to learning assistance that combines multiculturalism and motivation (Ginsberg & Wlodkowski, 2009). In the remainder of the chapter, Arendale reviewed best practices from the literature and highlighted specific institutions and programs that make use of one or more of them. Arendale arranged best practices into the following six categories:

- Organizational and administrative practices

- Essential program components

- Critical instructional practices

- Important personnel practices

- Rigorous evaluation procedures

- Necessary institutional practices, policies, and culture

In the final chapter on the future of the learning assistance field, Arendale focused on key recommendations for future research and suggestions for change at all levels from the professionalization of learning assistance administrators to collaboration with state and federal officials. Arendale highlighted the need for research on best practices in developmental courses because this area is the "most vexing and controversial element in learning assistance" (p. 69). To this end, he suggested comparison of programs that have been certified versus similar programs that have not. Arendale also renewed the call for creation of a new learning assistance organization combining and expanding the current professional organizations. This somewhat controversial proposal, formally introduced in 2006 by the Blue Ribbon Commission composed of leaders of the national organizations, has, so far, not been implemented. However, coordination and collaboration have increased significantly under the aegis of the Council of Learning Assistance and Developmental Education Associations. In addition, Arendale called for a federally-funded national center focused on postsecondary access and success. In this regard, Arendale could have mentioned the National Center for Postsecondary Research. This center was established in 2006 with a $10 million grant from the U.S. Department of Education, and the mission of the center appears to overlap significantly with Arendale's recommendation (National Center for Postsecondary Research, n.d.).

Arendale's arguments on behalf of learning assistance are well framed, succinct, and persuasive. The book provides an excellent overview of the learning assistance field and offers an extensive reference list for those desiring more depth on a particular topic. Practitioners can read this book to gain a multitude of implementable ideas on enabling or improving access and success. Local and national leaders can use the book to help foster a more informed dialog on institutional, state, and national learning assistance policies. I exhort you to read it now. Give copies to others involved in learning assistance or those who need to know more about it. Access and learning assistance are at a crossroads. Reading this book will help us all focus on the best path forward.

References

Boroch, D. J., Hope, L., Smith, B. M., Gabriner, R. S., Mery, P. M., Johnstone, R. M., & Asera, R. (2010). *Student success in community colleges: A practical guide to developmental education*. San Francisco, CA: Jossey-Bass.

Cutts, A. B. (1935). The educational influence of Aberdeen in seventeenth century Virginia. *The William and Mary Quarterly, 15*, 229-249. doi:10.2307/1923179

Ginsberg, M. B., & Wlodkowski, R. J. (2009). Diversity and motivation: Culturally responsive teaching in college (2nd ed.). San Francisco, CA: Jossey-Bass.

National Center for Postsecondary Research. (n.d.). *Welcome*. Retrieved August 12, 2012, from http://www.postsecondaryresearch.org

Coupons for Success: A Marketing Incentive in Academic Support

DONNA R. POTACCO
PETER CHEN
DANIELLE DESROCHES
DANIEL R. CHISHOLM
SANDRA DE YOUNG

WILLIAM PATERSON UNIVERSITY

Abstract

How does a Coupon Incentive Program motivate students to seek academic support in high-risk courses? Results from this study demonstrated that the Coupon Incentive Program was effective in motivating voluntary student attendance and improving student outcomes. Recommendations related to implementation of the Coupon Incentive Program are discussed.

Keywords: **reward, motivation, academic support, Study Group, academic performance**

Introduction

A primary dilemma in academic support is the ability to motivate students to seek academic intervention early in the semester before they are in academic jeopardy. This need is particularly important for students in "high-risk" courses who are not cognizant of and/or prepared for the demands of higher education.

Extrinsic motivation in the form of salaries, bonuses, commissions, promotions, and prestige is a form of encouragement used in society to improve behavior. It is also widespread in higher education in the form of scholarships, awards, and grades. However, there is controversy over the use of incentives to motivate learning in that some academicians believe that students should be intrinsically self-motivated to learn, rather than extrinsically motivated.

This paper reports the efficacy of using an extrinsic incentive program in academic support to increase the academic performance

For more information contact: Donna R. Potacco | William Paterson University | College of Science and Health | 300 Pompton Road | Wayne, NJ 07470 | Telephone: 973.720.3418 | Fax: 973.720.3414 | e-mail: PotaccoD@wpunj.edu |

of students. Within this discussion, student performance outcomes will be reported and recommendations will be made relative to the program factors used to influence this effectiveness.

Theoretical framework of the Reward Mechanism

The relationship of influences capable of affecting motivation and self-regulation in learning has been debated extensively. Eisenberger and Cameron (1996) suggested that "a tangible reward that one perceives as being deserved for successful performance of an activity is likely to maintain or enhance the perception of self-competence" (p. 1164). Alternatively, Stage (1996) addressed the reciprocal relationship of success, self-efficacy, and motivation reporting that as "students' beliefs about themselves become increasingly positive, their motivation to perform and, ultimately, [their] performance are enhanced" (p. 230). He proposed that the development of self-efficacy for college students is related to their previous conceptions of ability, social environment, progress feedback, and perceived controllability. Driscoll (2005) further suggested that a "strong source of motivation comes from learners' beliefs about themselves in relation to task difficulty and task outcome" (p. 316), implying students' beliefs that they are capable of satisfactorily achieving task expectations is important in motivating them to pursue a task.

Based on the literature (Driscoll, 2005; Eisenberger & Cameron, 1996; Stage, 1996), reward, motivation, performance, and self-efficacy can, therefore, be perceived as a cycle of interacting mechanisms that are capable of sustaining a behavior when supplemented with the correct learner, social, and instructional variables (Figure 1). That is, when properly selected, rewards or incentives have the capability of motivating a behavior. As a result of performing that behavior, a student will experience either a good or bad outcome (performance). If the outcome is positive, student self-efficacy and competence will be positively affected and the student will be motivated to attempt the behavior again. The focus of this paper will be directed to research which elucidates how rewards can be used to maximize the utility of the proposed model for academic support.
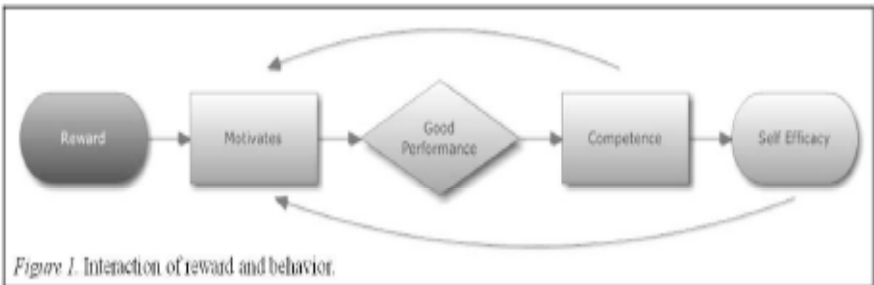

Figure 1. Interaction of reward and behavior.

Rewards

A well-run rewards system has the ability to encourage both workers and students to accept tasks, set goals, and invest time that they might not accept or set on their own. Covington and Müeller (2001) aptly stated that intrinsic motivation "does not operate in a reward vacuum. Human beings always anticipate some payoff for their actions, intrinsically driven or not" (p. 162). The practice of using incentives to increase academic performance and task interest has been well-documented both in the literature (Schunk, 1984; Eisenberger, Rhoades, & Cameron, 1999; Harackiewicz & Manderlink, 1984) and experientially in the classroom (Haywood, Kuespert, Madecky, & Nor, 2008; Ash, 2008; Reeves & Taylor-Cox, 2003; Spencer, Noll, & Cassidy, 2005).

Performance

When higher rewards were given for a greater skill (performance), Rosenfield, Folger, and Adelman (1980) observed that the intrinsic motivation of subjects was greater. In corroboration, Eisenberger, Rhoades, and Cameron (1999) reported that "Reward for high performance increased perceived autonomy and intrinsic motivation among college students who were given a novel task" (p. 1036). In explanation, Eisenberger, Pierce, and Cameron's (1999) meta-analysis suggested that "reward procedures requiring specific high task performance convey[ed] a task's personal or social significance, increasing intrinsic motivation" (p. 677).

Task Interest

It has been proposed that (a) reward can increase or maintain a participant's interest in the activity and (b) reward can also influence the participant's behavior after initial task interest has faded.

In support of proposition (a), above, meta-analyses have been conducted on the topic of reward and task interest (Cameron, Banko, & Pierce, 2001; Deci, Koestner, & Ryan, 1999; Tang & Hall, 1995). Furthermore, Harackiewicz and Manderlink (1984) found that "the promise of performance-contingent rewards significantly enhanced interest, relative to no-reward controls receiving identical performance feedback" (p. 531). In a later study, Hidi and Harackiewicz (2000) observed that

> a combination of carefully administered external rewards and situationally interesting activities may be one of the most realistic approaches to educational intervention. If students become engaged in academic tasks, there is at least a chance that genuine interests and intrinsic motivation will emerge. (p. 159)

Regarding proposition (b), Covington and Müeller (2001) suggested that if the activity is found engaging, extrinsic rewards can support intrinsically oriented activities and may reinforce intrinsically oriented behaviors.

Reward Value

Rosenfield et al. (1980) found that greater rewards (in terms of payment given) for greater skill "led to a greater willingness to work on the task in the future, greater liking for the task, and more free time spent playing with the task than did low pay" (p. 374). The authors suggested that greater reward indicated greater competence and, consequently, greater intrinsic motivation. In a later study, Akin-Little, Eckert, Lovett, and Little (2004) proposed that "Rewards that communicate task performance and satisfy needs, wants, and desires can increase intrinsic motivation, whereas rewards that convey a message that the task is extraneous to needs, wants, and desires may decrease intrinsic motivation" (p. 349).

Timing and Frequency

Research has provided evidence that the frequency of a behavior is more likely to result from repeated administration of the reward (Carton, 1996; Skinner, 1938) and reward-behavior proximity (Carton, 1996; Skinner, 1938; Thomas, 1981, 1983). In corroboration of the latter, when Hitt, Mariott, and Esser (1992) investigated the effect of reward timing relative to task interest, it was found that undergraduate students asked to perform tasks of low interest for a minimum of ten minutes spent additional, voluntary, time in immediate-reward conditions compared to students in the delayed-reward and students in the no reward conditions. Furthermore, students asked to perform tasks under delayed-reward conditions spent additional, voluntary, time on tasks of low interest, compared to students in the no-reward control.

Incentive Type

In a classic study, Lipe and Jung (1971) outlined a wide range of incentives, including material incentives, social incentives (praise, social pressure), knowledge of results (corrective feedback), secondary reinforcement (tokens, tickets, points), vicarious reinforcement (reward for a behavior), and aversive incentives (reprimands, disapproval), that are still used in education today, along with grades, scholarships, and financial assistance. Lipe and Jung (1971) further observed that the

> Secondary incentives appear to be as effective as material or social incentives in influencing behavior, once a system for their delivery and exchange has been established. The additional value of secondary reinforcers is their flexibility. They can be adapted in countless ways to be both convenient and effective. (p. 260)

Coupon Incentive Study

The Coupon Point program was constructed based on the theoretical framework of the reward mechanism and modeled after the highly

successful $6.6 billion coupon industry (Sloan, 2008). Similar to the marketing model, these Coupon Points (product discount) were exchanged for a cost (active participation in a Study Group). Since these points were a secondary incentive, professors were able to establish a rate of exchange for these points based on class and/or program needs.

Study Group

The success of Study Groups in promoting student achievement has been well documented (Potacco & DeYoung, 2007; Light, 1990, 1992; Martin & Arendale, 1990, 1992, 1994; Matyas & Malcom, 1991). Effectual groups can help learners satisfy social needs, such as camaraderie (Bowman, 2007), connectedness (Ryan & Deci, 2000), and increased engagement (Johnson, Johnson, & Stanne, 1985; Akey, 2006), thereby helping students continue participation or task persistence within the group (Eisenberger, Kuhlman, & Cotterell, 1992). Within our Study Groups, study skills were developed; content discussed; and feedback were provided by positive role models. As facilitators, Group Leaders empowered students by showing them how to learn through peer teaching and teamwork. In agreement with previous findings (Benware & Deci, 1984; Dansereau, 1988; Devin-Sheehan, Feldman, & Allen, 1976; Newbern, Dansereau, Patterson, & Wallace, 1994; Slavin, 1996; Webb, 1989, 1992), we found that group learning has many benefits, including the understanding and reinforcement of concepts, the development of self-esteem and increased confidence.

Purpose

The purpose of the current study was to determine the effects of the Coupon Incentive Program and Study Group attendance on student grade performance and to identify factors influencing the Coupon Incentive Program's effectiveness. Four research questions were evaluated:

1. To what extent does the Coupon Incentive Program Motivate Study Group attendance?

2. What is the effect of this Study Group attendance on the first exam performance?

3. Is Study Group attendance still effective after the first exam if students have not previously chosen to attend a Study Group?

4. To what extent does exam failure motivate a student to choose the Study Group/Coupon Incentive Program option?

Methods Subjects

A total of 311 students at a metropolitan, state university participated in this study. The students were enrolled in nine sections of a Basic Anatomy and Physiology I course populated by Kinesiology majors and seven sections of a General Anatomy and Physiology II course consisting of Nursing majors. Both of these courses are considered high-risk based on the proportion of students who historically receive a failing grade. These courses were taught by two different professors. Data was collected for three semesters.

Procedures

Information about the Coupon Incentive Program was provided to students in each course section by both a Coupon Program representative and the course instructors. Additional program information was provided through flyers, brochures, and the university's website. Study Groups were used to provide academic support. Study Group facilitators were undergraduate upper level Biology or Nursing students who had taken at least one year of Anatomy and Physiology.

Program administration

Students were required to sign a "Study Group Sign-in" Sheet and a "Lecture Tutoring Coupon". Student names on the "Sign-in" sheet were entered into a dynamic database to provide professors and staff with real-time information of student attendance. The "Lecture Tutoring Coupon" was submitted by students to their professors in exchange for exam points.

Since this program impacted students' grades, it was critical to implement appropriate security measures. Red ink was used for signatures and the "Lecture Study Group Sign-In Sheet" and "Lecture Tutoring Coupon" were color-coded to prevent Coupon photocopying. Each Study Group session was documented with two signatures, the tutor's and the director's; student attendance was entered into the database by office staff.

Measures

The extent of student participation in the Coupon Incentive Program was determined quantitatively through several measures: the number of Study Groups attended by students per exam cycle or semester; the number of Coupon Points earned; and/or at what time during the semester Coupon Points were earned. Study Group sessions were recorded by day, week, and exam to establish the frequency of Study Group attendance and distribution over time.

The redemption value of each Coupon Point was one extra exam point for the purposes of this study. No more than six extra points could be added to an exam for a total possible exam score of 106%. Each Study Group session

consisted of 1.25 hours of student participation. Students redeemed their Coupon Points with their professors at the end of each exam cycle.

Coupon cycles were given a value of "1" if the student attended more than three Study Group sessions over three or more weeks during a five-week exam cycle or if the student attended more than three Study Group sessions over two or more weeks during a four week exam cycle. Student attendance in any Coupon cycle that did not satisfy these criteria was assigned a Coupon value of "0". Coupon cycles were labeled based upon the point in time at which the Coupon Points were issued. For example, Coupon Cycle 1 refers to Coupon Points issued for Study Group attendance prior to the first exam, Coupon Cycle 2 refers to Coupon Points issued for Study Group attendance between exams 1 and 2, and Coupon Cycle 3 refers to Coupon Points issued for Study Group attendance between exams 2 and 3.

"Student outcome" was measured using students' exam scores, exam averages, or final grades. Exam scores and averages did not include extra points exchanged for Coupon Points. "Final Grade" was the letter grade earned by the student at the end of the semester. Extra points the students may have received in exchange for Coupon Points were included in the final grade. Each exam cycle ranged from the beginning of the course, or from the day after the previous exam, until the day of the next exam. All exam scores are collapsed into Pass/Fail categories (Pass = "C" or above; Fail = "D" or "F").

Analysis

There are two ways that we could have shown that Study Group participation had a positive effect on test scores: independent samples t test or logistic regression. Although t test would have shown whether average scores increased in the tutored group, the more important question for us was whether there was an increased proportion of students successfully finishing their course with a grade of C or better. For this reason we used logistic analysis which provided us with odds ratio and proportion.

The Odds Ratio is defined as the odds of a students receiving valid Coupon Points and failing versus the odds of students earning no Coupon Points and passing. For example, if the Odds Ratio for exam 1 is 0.345 (Table 1), the odds of receiving a failing grade for the group receiving Coupon Points before exam 1 (Coupon Cycle 1) is 34.5% of their odds of receiving a failing grade without getting the Coupon Points. This means that individuals receiving Coupon Points during this interval had reduced odds of receiving a failing grade by 65%. A 95% confidence interval was used for all true odds reduction ranges.

Table 1

Effect of Study Group Attendance Before Exam 1 on Student Academic Outcomes

Student Outcomes	Odds Ratio	Odds Reduction	95% Confidence Interval
Exam 1 Score without Coupon Points	.345*	65%	[.206, .578]
Exam Average without Coupon Points[a]	.362**	64%	[.215, .611]
D_F final with Coupon Points	.153*	85%	[.07, .331]

[a] Exams 1, 2, and 3. *p<.0001 **p=.0001

Results

To what Extent did the Coupon Incentive Program Motivate Study Group Attendance?

Since the incorporation of the Coupon Incentive Program in 2003, student attendance increased 139%. This growth was gradual in the beginning but increased substantially as professors and students increased use of the program.

What is the Effect of this Study Group Attendance on the First Exam Performance?

The outcome of students receiving Coupon Points was studied at three times during the semester cycle to determine whether the time at which students received help had an impact. Three measures were used for each evaluation: the exam score without Coupon Points; the exam average without Coupon Points; and the final course grade with Coupon Points. As shown in Table 1, all three of these measures demonstrated that the odds of receiving a failing, "D" or "F", grade were significantly lower for students attending Study Group sessions before the first exam (Coupon Cycle 1), compared to students who did not attend Study Group sessions during this cycle. Students attending Study Group sessions before exam 1 also had a 65% reduction in the odds of receiving a failing grade on exam 1 and a 64% odds reduction of receiving a failing exam average for the first three exams compared to students not attending Study Groups during this cycle. When the final letter grade was used as the measure, this effect was more dramatic. Students attending Study Groups before exam 1 had an 85% lower chance of receiving a failing final grade than those who did not.

Is Study Group Attendance still Effective After the First Exam, if Students have not Previously Chosen to Attend a Study Group?

This question was addressed by comparing the academic outcomes of students who chose to attend Study Groups after, but not before, the first exam. Since it is possible that student success was influenced by confounding variables, we addressed this question by first comparing the academic outcomes of students who failed the first exam and then comparing the academic outcomes of students who passed the first exam.

The academic outcomes of students who failed exam 1, but attended Study Groups between exams 1 and 2 (Coupon Cycle 2), were compared with students who failed the first exam and did not participate in Study Groups between exams 1 and 2 (Table 2). Students who failed exam 1 did not attend a Study Group before the first exam (Coupon Cycle 1), and attended a Study Group between exam 1 and 2 (Coupon Cycle 2), reduced their odds of failing exam 2 by 70%. The impact of this effect on students' academic outcome was more pronounced when the average scores of exams 2 and 3 and the final grades were used as measures. Students not attending a Study Group before the first exam, failing exam 1, and attending a Study Group between exams 1 and 2 had an 88% reduction in odds of receiving a "D" or "F" on the average of exams 2 and 3. Furthermore, the odds of these students receiving a failing final grade were reduced 78%.

Table 2

Effect of Study Group Attendance Between Exams 1 and 2 on the Academic Outcomes of Students who Failed the First Exam

Student[a] Outcomes	Odds Ratio	Odds Reduction	95% Confidence Interval
Exam 2 Score without Coupon Points	.301*	70%	[.115, .791]
Exam Average without Coupon Points[b]	.125**	88%	[.028, .554]
D_F final with Coupon Points	.222***	78%	[.085, .582]

[a]Students did not attend Study Groups during Coupon cycle 1. [b]Exams 2 and 3. *p=.0148. **p=.0062. ***p=.0022.

Table 3

Effect of Study Group Attendance Between Exams 1 and 2 on the Academic Outcomes of Students who Passed the First Exam

Student Outcomes[a]	Odds Ratio	Odds Reduction	95% Confidence Interval
Exam 2 Score without Coupon Points	.069*	93%	[.009, .542]
Exam Average without Coupon Points[b]	.177**	82%	[.048, .657]
D_F final with Coupon Points	N/A	N/A[c]	N/A

[a]Students did not attend Study Groups during Coupon Cycle 1. [b]Exams 2 and 3. [c]All Students Passed Course. *p=.0111. **p=.0096.

The academic outcome of students who did not attend Study Groups before exam 1, passed exam 1, and attended Study Groups between exams 1 and 2 was even better. As shown in Table 3, students who did not attend Study Groups before exam 1, passed their first exam, and attended Study Groups between exams 1 and 2, reduced their odds of getting a "D" or "F" on exam 2 by 93%. When the measure of student outcome was changed to the average of exams 2 and 3, the odds reduction remained high at 82%. A similar analysis could not be done for these students using the final letter grade as a measure because the sample size of students not seeking Coupon Points was too small. It is noteworthy, however, that 100% of the students who passed the first exam and attended Study Groups between exams 1 and 2 passed the course, compared to the 82% pass rate of the student cohort who passed the exam 1, but did not attend Study Groups before exams 1 or 2 (Coupon Cycles 1 and 2).

Although students who passed the first exam had a more favorable outcome than students who failed the first exam, it is apparent that both cohorts reduced the odds of receiving a "D" or "F" by attending Study Groups between exams 1 and 2. This provides evidence that students attending Study Groups prior to exam 2 were still able to positively influence the academic outcome.

To what Extent does Exam Failure Motivate a Student to Choose the Study Group/Coupon Incentive Program Option?

The greatest demand for a Study Group was observed when a student failed the first exam and remained in the course. At this point, the student was aware of academic jeopardy, yet had time to improve the grade. In support, using the proportion of students who sought academic support before the first exam as a reference value and a large sample Z test for proportion, it was found that significantly more students attended Study Groups after failing the first exam ($z=12.76$, $p < 0.001$). Conversely, if students passed the first exam, there was no significant difference in the proportion of students who attended Study Groups before and after the first exam, ($z=.68$, $p=.500$). We propose that the positive incentive of the Coupon Incentive Program in combination with negative incentive of a poor exam grade was responsible for the increase in Study Group demand.

Discussion and Recommendations

There were advantages in using Coupon Points as a secondary incentive to extrinsically motivate students. The immediacy of the reward (Coupon Points) accomplished the goal of helping students quickly see the connection between a behavior (academic support) and the reward (extra credit). Ideally, after students are engaged through these incentives, institutions then have the opportunity to provide students with learning skills that will empower them to be intrinsically motivated self-learners. Study Groups have the potential to facilitate this transition.

The Study Group Connection

Study Groups proved to be an ideal medium for providing students with training, experience, and role modeling that could influence academic competence, self-efficacy and goal persistence. As noted by Locke (1996),

> People are most likely to believe they can attain a goal when they believe that it is within their capability. This implies three paths to commitment: *adjust the goal* to the person's present capacity; raise the person's capacity through providing *training and experience*; or change the person's perspective on their capacity through *expressions of confidence and role modeling* (Bandura, 1986). (p. 119)

Furthermore, Study Groups provided a means of achieving the long range goal of inducing student learning that would be intrinsically rewarding. As noted by Williams and Stockdale (2004), it may be in the best interest of college students for educators to maximize the utility of extrinsic motivators recognizing that "most behaviors are probably sustained through a combination of intrinsic and extrinsic consequences" (p. 216).

Program Influences

Competence versus complexity

Student perception of personal competence appeared to influence the reaction to the reward program. That is, students believing there was no need for academic support were less motivated to seek Coupon Points. The significantly higher proportion of students seeking academic support post-exam, compared to pre-exam, provided strong evidence of this observation. This phenomenon was frequently observed with freshmen and those students taking the first challenging course, quite possibly due to overestimation of personal capability and/or underestimation of the course's difficulty.

Grades

Covington and Wiedenhaupt (1997) found that

> virtually all the students in our college samples rate achieving the highest grade possible as the main reason for learning, with such reasons as increasing one's knowledge or undertaking work as a matter of personal challenge rated far less important. (Covington and Mueller, 2001). (p. 159)

In corroboration, our study found that one of the most powerful incentives capable of motivating students to participate in the Coupon Incentive program was grades. A significantly greater number of students sought Coupon Points after failing the first exam versus students who passed it, providing evidence that students appear to be more inclined to participate in this type of incentive program if perceived academic outcome was in jeopardy.

Reward

Reward value

Williams and Stockdale (2004) related the importance of reward type and value to effectiveness, stating that if a reward is highly valued, the activity will be highly valued and may enhance the student's sense of perceived competence and self-determination. The authors further noted that "Highly valued rewards appear especially important for activities of minimal interest to students" (p. 226). In this study, both professors adopted the same Coupon Point exchange value. However, the symbolic value of Coupon Points can be adjusted to meet instructor, course, program, and/or student needs. Factors that appeared to influence the value of Coupon Points for students included goals, personality, self-efficacy, perceived competence, grades, and perceived professor opinion.

Reward timing

How frequently and when rewards are distributed within each semester appeared to be important factors in determining students' subsequent behavior and outcome. As an example, we know from our research that when professors award points to students at the end of the semester or before an exam, and do not require evenly spaced attendance, most students would seek Coupons close to the deadline. This behavior reduced Coupon Point effectiveness in that the ability to help students improve performance "last minute" is very limited. The sooner a student is helped, the more he or she will be able to use learned concepts to understand new content and the less chance negative assessments will adversely affect their academic outcome.

Conclusion

When carefully designed, a reward program in academic support can be highly successful in motivating students to enhance efforts, persistence, and academic outcomes in challenging courses. The Coupon Incentive Program also provided a mechanism for engaging students in Study Groups where multiple academic support strategies were used to influence their academic competence, self-efficacy, goal persistence, and intrinsic motivation. The use of extrinsic rewards for these purposes may be particularly effective for students in high-risk courses and/or for at-risk populations.

Acknowledgments

References

Akey, T. M. (2006). *Student context, student attitudes and behavior, and academic achievement: An exploratory analysis*. Retrieved from the MDRC website: http://www.mdrc.org/ publications/ 419/full.pdf

Akin-Little, K. A., Eckert, T. L., Lovett, B. J., & Little, S. G. (2004). Extrinsic reinforcement in the classroom: Bribery or best practice. *School Psychology Review, 33*(3), 344-362.

Ash, K. (2008). Promises of money meant to heighten student motivation. *Education Week, 27*(23), 1-17.

Benware, C., & Deci, E.L. (1984). Quality of learning with an active versus passive motivational set. *American Educational Research Journal, 21,* 755-766.

Bowman, R. F. (2007). How can students be motivated: A misplaced question? *The Clearing House, 81*(2), 81-86.

Cameron, J., Banko, K. M., & Pierce, W. D. (2001). Pervasive negative effects of rewards on intrinsic motivation: The myth continues. *The Behavior Analyst, 24*(1), 1-44.

Carton, J. S. (1996). The differential effects of tangible rewards and praise on intrinsic motivation: A comparison of cognitive evaluation theory and operant theory. *The Behavior Analyst, 19*(2), 237-255.

Covington, M. V., & Müeller, K. J. (2001). Intrinsic versus extrinsic motivation: An approach/avoidance reformulation. *Educational Psychology Review, 13*(2), 157-176.

Covington, M. V., & Wiedenhaupt, S. (1997). Turning work into play: The nature and nurturing of intrinsic task engagement. In R. P. Perry &, J. C. Smart (Eds.), *Effective teaching in higher education research & practice* (pp. 101-114). New York: Agathon Press.

Dansereau, D.F. (1988). Cooperative learning strategies. In C. E. Weinstein E.T. Goetz & P.A. Alexander, (Eds.), *Learning and student strategies: Issues in assessment, instruction, and evaluation* (pp.103-120). Orlando, FL: Academic Press.

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin, 125(6)*, 627-668.

Devin-Sheehan, L., Feldman, R., and Allen, V. (1976). Research on children tutoring children: A critical review. *Review of educational research*, *46*(3), 355-385.

Driscoll, M. P. (2005). *Psychology of learning for instruction* (3rd ed.). Boston: Allyn and Bacon and Pearson Education.

Eisenberger, R., Kuhlman, D.M., Cotterell, N. (1992). Effects of social values, effort training, and goal structure on task persistence. *Journal of Research in Personality, 26(* 3), 258-272.

Eisenberger, R., & Cameron, J. (1996). Detrimental effects of reward. *American Psychologist, 51*(11), 1153-1166.

Eisenberger, R., Pierce, W. D., & Cameron, J. (1999). Effects of reward on intrinsic motivation-negative, neutral, and positive: Comment on Deci, Koestner, and Ryan (1999). *Psychological Bulletin, 125*(6), 677-691.

Eisenberger, R., Rhoades, L., & Cameron, J. (1999). Does pay for performance increase or decrease perceived self-determination and intrinsic motivation? *Journal of Personality and Social Psychology, 77*(5), 1026-1040.

Harackiewicz, J. M., & Manderlink, G. (1984). A process analysis of the effects of performance-contingent rewards on intrinsic motivation. *Journal of Experimental Social Psychology, 20*(6), 531-551.

Haywood, J., Kuespert, S., Madecky, D., & Nor, A. (2008). *Increasing elementary and high school student motivation through the use of extrinsic and intrinsic rewards.* (Master's Thesis, Saint Xavier University & Pearson's Achievement Solutions, Inc.). Retrieved from ERIC database (ED503268).

Hidi, S., & Harackiewicz, J. M. (2000). Motivating the academically unmotivated: A critical issue for the 21st century. *Review of Educational Research, 70*(2), 151-179.

Hitt, D. D., Marriott, R. G., & Esser, J. K. (1992). Effects of delayed rewards and task interest on intrinsic motivation. *Basic and Applied Social Psychology, 13*(4), 405-414.

Johnson, R.T., Johnson, D.W., & Stanne, M.B. (1985). Effects of cooperative, competitive, and individualistic goal structures on computer-assisted instruction. *Journal of Educational Psychology, 77*(6), 668-677.

Light, R. J. (1992). The Harvard assessment seminars: Explorations with students and faculty about teaching, learning, and student life. (Report No. 2). Cambridge, Massachusetts: Harvard University, Graduate School of Education and Kennedy School of Government.

Light, R. J. (1990). The Harvard assessment seminars: Explorations with students and faculty about teaching, learning, and student life. (Report No. 1). Cambridge, Massachusetts: Harvard University, Graduate School of Education and Kennedy School of Government.

Lipe, D., & Jung, S. M. (1971). Manipulating incentives to enhance school learning. *Review of Educational Research, 41*(4), 249-280.

Locke, E. A. (1996). Motivation through conscious goal setting. *Applied and Preventive Psychology,* 5, 117-124.

Martin, D. C., & Arendale, D. R. (1990). Supplemental instruction: Improving student performance, increasing student persistence. Kansas City, Missouri: Center for Academic Development, University of Missouri-Kansas City. (ERIC Document Service No. ED327103).

Martin, D. C., & Arendale, D. R. (1992). Supplemental instruction: Improving first-year student success in high-risk courses (The Freshman Year Experience: Monograph Series No. 7). Columbia, South Carolina: Center for the Freshman Year Experience, University of South Carolina. (ERIC Document Service No. ED354839).

Martin, D. C., & Arendale, D. R. (1994). Review of research concerning the effectiveness of SI from the university of Missouri-Kansas City and other institutions from across the United States. Kansas City, Missouri: National Center for Supplemental Instruction, University of Missouri-Kansas City. (ERIC Document Service No. ED370502).

Matyas, M. L., & Malcom, S. M. (Eds.). (1991). Investing in human potential: Science and engineering at the crossroads. Washington, D.C.: American Association for the Advancement of Science.

Newbern, D., Pansereau, D.F., Patterson, M.E., and Wallace, D.S. (1994, April). *Toward a science of cooperation.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans.

Potacco, D. R., & De Young, S. (2007). The business of academic support. *The Learning Assistance Review, 12*(2), 19-31.

Reeves, C.A., & Taylor-Cox, J. (2003). Using rewards in mathematics education: Two points of view. *Teaching Children Mathematics, 9*(7), 381-383.

Rosenfield, D., Folger, R., & Adelman, H. F. (1980). When rewards reflect competence: A qualification of the overjustification effect. *Journal of Personality and Social Psychology, 39*(3), 368-376.

Ryan, R.M. & Deci, E.L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology,* 25, 54–67.

Schunk, D. H. (1984). Enhancing self-efficacy and achievement through rewards and goals: Motivational and informational effects. *The Journal of Educational Research, 78*(1), 29-34.

Skinner, B. F. (1938). *The behavior of organisms: A experimental analysis.* New York: D. Appleton-Century-Crofts.

Slavin, R. E. (1996). Research on cooperative learning and achievement: What we know, what we need to know. *Contemporary Educational Psychology, 21*, 43-69.

Sloan, P. (2008). Listening to the coupon clickers. *Fortune, 157*(13), 114.

Spencer, M. B., Noll, E., & Cassidy, E. (2005). Monetary incentives in support of academic achievement: Results of a randomized field trial involving high-achieving, low-resource, ethnically diverse urban adolescents. *Evaluation Review, 29*(3), 199-222.

Stage, F. K. (1996). Setting the context: Psychological theories of learning. *Journal of College Student Development, 37*(2), 227-235.

Tang, S., & Hall, V. C. (1995). The overjustification effect: A meta-analysis. *Applied Cognitive Psychology, 9*(5), 365-404.

Thomas, G.V. (1981). Contiguity, reinforcement rate and the law of effect. *Quarterly Journal of Experimental Psychology,* 33B, 33-43.

Webb, N.M. (1989). Peer international and learning in small groups. *International Journal of Educational Research, 13* 21-39.

Webb, N.M. (1992). Testing a theoretical model of student interaction and learning in small groups. In R. Hertz-Lazarowitz & N. Miller (Eds.), *Interaction in cooperative groups: The theoretical anatomy of group learning* (pp. 102-119). New York: Cambridge University Press.

Williams, R. L., & Stockdale, S. L. (2004). Classroom motivation strategies for prospective teachers. *The Teacher Educator, 39*(3), 212-230.

The Effect of Tutoring on Math Scores for the Praxis I Exam

ROBERT LONGWELL-GRICE
JANINE MCILHERAN
MARK SCHROEDER
STEVE SCHEELE

UNIVERSITY OF WISCONSIN - MADISON

Abstract

The Praxis test is one of a series of national teacher certification exams written and administered by the Education Testing Service (ETS) since 1947. Currently, forty states now require some form of the Praxis Series (Educational Testing Service, 2011). Using pre- and post-tests similar to the Praxis I math exam, this study examined the affect tutoring has on scores. Results were analyzed by race, gender, year in school and number of math courses taken. The study shows that tutoring has a significant, positive effect on scores. The paper makes recommendations for helping students prepare for the Praxis I exam.

Key words: **praxis preparation, tutoring**

The Praxis test is one of a series of national certification exams written and administered by the Education Testing Service (ETS) since 1947. Various Praxis tests are usually required before, during, and after teacher training courses in the U.S. Currently, forty states now require some form of the Praxis Series (Educational Testing Services, 2011). This study examined whether or not tutoring improves the scores for students taking the math section of the Praxis I exam. Student results were analyzed by race, gender, year in school and number of math courses taken. The study shows that tutoring can have a significant, positive effect on test scores for students.

The Praxis I, or Pre-Professional Skills Test (PPST), consists of three exams: reading, writing, and mathematics. In most colleges and universities, a passing score must be earned for admission to the teacher education program. In the 40 states that now require the Praxis exam, a passing score must be earned before the teacher education grad uate can apply for his or her teaching license or certificate. Praxis

For more information contact: Robert Longwell-Grice | 118 Mellencamp Hall | UW Milwaukee | Milwaukee, WI 53211 | Telephone: 414.229.4633 | Fax: 414.229.6793| e-mail: robert@uwm.edu |

tests are assessments that provide colleges and state agencies with "objective" information that can be used in making licensing decisions. States requiring the Praxis exam generally require students applying for admission to their initial teacher licensure program to pass all three parts of the Praxis I exam (reading, writing, and math) prior to being admitted. Programs affected by this requirement are generally housed within departments of curriculum and instruction, special education, and often within departments such as art and dance. Many states allow institutions of higher education to grant waivers to no more than 10 percent of the total number of students admitted for each admissions year under conditions determined by the university.

While the requirement that prospective teachers demonstrate a level of competency on basic skills has existed for many years, the requirement still causes a considerable amount of debate. Proponents of testing for teacher certification argue that other professions such as law and medicine require certification exams and maintain that current teacher testing requirements are, if anything, too lenient (Center for Education Reform [CER](CER, 2011). Opponents of teacher certification exams counter that high-stakes testing is unreliable and has not been shown to be related to good teaching (Fair Test, 2011). Furthermore, critics maintain that certification exams such as the Praxis I exam tend to discriminate on the basis of race and gender, resulting in larger numbers of people of color and females failing (than whites or males).

Recruitment of students of color into teaching has clearly not kept pace with enrollment increases, and critics speculate that reliance on the Praxis exams could be a factor (Broughman & Rollefson, 2000). In support of this argument, Gitomer, Latham & Ziomek (1999) found that among teacher candidates taking the Praxis I exam, White candidates passed at the highest rate (87%) and Black candidates at the lowest rate (53%).

A second controversy in the field of teacher education revolves around the relationship between these required teacher certification exams and teacher quality. To date the relationship between success on certification exams and effectiveness in the classroom is unproven (Bowen, 2002); however, research suggesting that teachers exert an influence on student achievement certainly exists and there is an argument to be made that knowledge of subject matter may be related to successful teaching (Rowan, Correnti & Miller, 2002; Hanushek, Rivkin & Kain, 2004; Wright, Horn & Sanders, 1997).

Data collected by the University of Wisconsin-Milwaukee found differences in the passing rates based upon gender and ethnicity that appear to support the critics opposed to mandatory testing for teachers. Consider the following data provided by ETS for 2009-2010. These data compare overall national means (for math, writing and reading) to the mean scores of students attending the University of Wisconsin-Milwaukee (by gender and ethnicity):

Table 1. Mean Scores for Praxis I for UWM Males and Female Students

Test Overall	Overall	Male	Female
National		UWM	
Math 177.25	179.40	181.00	178.84
Writing 175.21	177.55	180.38	176.12
Reading 176.97	179.24	179.71	177.75

Table 2. Mean scores for Praxis I for UWM Students by Ethnicity

Test Overall	Overall	Asian	Black	Hispanic	White
National			UWM		
Math 177.25	179.34	175.69	172.62	173.72	180.21
Writing 175.21	177.55	174.13	173.94	175.00	176.59
Reading 176.97	178.40	174.50	174.60	176.58	179.00

These data are comparable to the data provided by ETS and appear to support the critics' contentions that males and whites do better on the Praxis exam than their peers.

Regardless of which side one takes on the argument regarding national testing requirements for teachers, it does appear that this requirement will remain for the foreseeable future. This fact has caused many teacher certification programs to design workshops that prepare their students for the respective certification exam. Additionally, with over 40 states now requiring the Praxis exam, the focus for most of these programs has been on preparing for the Praxis I exam.

To assist University of Wisconsin-Milwaukee students, the School of Education opened the Education Resource Center (ERC) in 2003. The ERC's sole purpose was to assist students in preparing for the Praxis exams, particularly the Praxis I exam. In addition to providing students with self-directed study guides and computer-assisted material, the ERC offers regular workshops. Shortly after it opened the ERC also began to offer tutoring to students who requested it. As we began to collect data about our students, and how they performed on the Praxis I exam, it became clear that some students (as shown in the previous charts) performed better than others. Having this information made us wonder if the tutoring we offered was assisting our students. Specifically, we wondered if students who performed poorly on the Praxis I exam were being helped by our tutoring and if this tutoring helped them pass the exam. This led us to a decision to conduct a study that would help answer this question.

Methods

   In 2006, the University of Wisconsin-Milwaukee was granted permission to conduct a study to assess the effectiveness of the tutoring provided by the ERC. The study was conducted over a three-year span, beginning in the fall of 2006, concluding in the summer of 2009. During this time period, 107 students participated in the study, resulting in 104 usable scores.

   Students were recruited each semester through the ERC, which is housed in the School of Education. Participants for this study were recruited through e-mails and fliers posted throughout the School of Education. Faculty members from various courses also encouraged students to participate in the study as well. Most of these faculty members taught courses (e.g., Educational Psychology) that required students to participate in a campus research study. Participation in this study met that requirement. Since the students were usually education majors, participation in the study served two purposes for them: class credit and preparation for the Praxis I exam. Although these faculty members taught courses that were required of Education majors, non-majors who took the courses were also allowed to participate in the study. Care was taken by the tutors conducting the study to insure that participants were taking the study seriously and were not there simply to meet the requirement, resulting in a high participant-to-usable data score.

   Upon completion of the required consent forms, participants completed a multiple choice math pre-test. The pre-test was a shorter version of the Praxis I exam and was comprised of 20 questions. Participants had 30 minutes to complete the pre-test, after which the test was graded and a tutor reviewed the test with the participant. The participant then received tutoring to explain the math concepts covered by the exam. The tutoring portion lasted approximately 45 minutes. Immediately following the tutoring session, participants were given a second (post) test. The post-test also was comprised of 20 multiple-choice questions and was again a shortened version of the Praxis I exam. The pre- and post-tests were of equal difficulty, and contained the same categories of questions. Following the post-test, the scores of the pre-test and post-test were compared to determine the effect tutoring had on the post-test results. After sufficient results were collected, an analysis of the data was conducted to determine the collective effect tutoring had.

   For the math practice test, questions were divided into degrees of difficulty: easy, average and difficult. The pre-test and the post-test contained an equal number of easy, average and difficult questions. In addition, each test contained the same categories of questions. For the math tests, the categories were: Conceptual and Procedural Knowledge (which include fractions and estimations); Understanding of and Use of Representations of Quantitative Information (which includes reading and interpreting visual displays of quantitative information such as graphs); and Understanding and Use of Informal Geometry and Measurement

and Reasoning in a Quantitative Context (which includes knowledge of measurement problems). Using the degree of difficulty as determined by the information given for each question by ETS, and the categories for each question, we were able to construct two equal tests for the study.

In addition to the scores from the participants pre- and post-tests, participants also provided descriptive data. The data included: age; gender, year in school, number of credits completed, major, number of math courses taken in high school and college, and whether or not the person had taken the Praxis I exam before (and number of times). The data was collected in order to determine the effect each variable had on tutoring. No names or other method of identifying the participants was collected. Data was anonymous and confidential.

Score data was recorded on an Excel database and kept in a shared drive with limited access given to the tutor (for recording purposes), and the Primary Investigators. The original pre- and post-tests were kept in a locked drawer in the School of Education. The tutors were undergraduate and graduate students who had been trained as math tutors through the Academic Support program on campus. Each tutor was also required to have met the university's math requirement by having taken at least one college-level math course with a grade of B or higher. A decision was made to allow several tutors to work with the study (as opposed to one specific tutor) as a way to mitigate any effects related to the strengths or weaknesses of the tutors themselves.

Results

Pre-test Scores

Detailed means, standard deviations, and number of participants are presented for each value of the demographic variables in Table 5. Bivariate correlations were calculated for continuous and ordinal demographic variables with pre-test scores. Age in the study was represented as an ordinal variable and was negatively correlated with pre-test scores, while the number of credits and the number of high school math courses, and the total number of math courses taken were positively correlated with pre-test scores. Means, standard deviations, and correlations are provided in Table 6. Examinations of differences between categorical variables revealed that males tended to have slightly higher pre-test scores than females, t (104) = 2.36, p = .020, r^2 = .051, but no other differences between groups were apparent, possibly due to low representation in some ethnic and college-level groups.

Table 3. Descriptive statistics for categorical demographic variables

Demographic Variable	N	Mean Pre-Test	Standard Deviation
		Scores	
Gender			
Male	28	14.39	3.44
Female	78	12.40	3.97
College level			
Undergraduate	104	12.91	3.93
Graduate	2	13.50	4.95
Ethnicity			
African American	4	10.00	2.16
Hispanic/Latino	5	10.00	5.39
Southeast Asian	1	17.00	–
Other Asian/Pacific Islander	6	14.50	3.21
White, Non-Hispanic	56	12.84	3.32
Unidentified	34	13.44	4.64
Age Groups			
18-25	79	13.52	3.61
26-35	11	12.82	4.19
36-45	9	11.00	3.39
46-55	7	8.86	5.11

Table 4. Correlations between pre-test scores and demographic variables

	1.	2.	3.	4.	5.	6.†
1. Pre-test		.338**	.232**	.055	.221*	-.276**
2. Credits			.417**	.253**	.493**	-.650**
3. Total High School Math Courses				-.038	.779**	-.266**
4. Total College Math Courses					.597**	-.290**
5. Total Math Courses						-.358**
6. Age†						
Mean		13.04	11.79	2.36	3.27	0.91	–
Standard Deviation		3.76	5.46	1.33	1.64	1.02	–

Note: * $p < .05$; ** $p < .01$; † ordinal variable

Difference Scores

Because of the possible impact of ceiling effects, it was expected that initial pre-test performance would interact with difference scores such that higher pre-test scores would be associated with higher gains. To test this hypothesis, a one-way within subjects ANCOVA was run with time as (pre-test, post-test) as the within-subjects variable and pre-test scores as a covariate. There was a significant main effect of time, $F(1,104) = 18.71$, $p < .001$, $h_p^2 = .15$ and a pre-test by time interaction, $F(1,104) = 16.75$, $p < .001$, $h_p^2 = .14$. Follow up analyses were conducted to examine the impact of tutoring at one standard deviation below the mean pre-test score (9.00), the mean pre-test score (12.93), and one standard deviation above the mean pre-test score (16.84) (see table 7). Results indicate that one standard deviation below the mean pre-test score there was significant improvement, while at the mean pre-test score a smaller positive change was not statistically different, and one standard deviation above the mean pre-test score a small negative change was also not statistically different. Additional tests were conducted to determine if the interaction between time and pre-test scores was moderated by age, ethnicity, gender, and number of math classes taken, but no significant moderating effects were found. A broad view of these results suggest that changes in scores are largely a function of regression to the mean, and although the impact of the tutoring program was significant for people with a relatively low level of initial ability, the practical meaning of that change was small.

Table 5. Pre-test and Post-test Scores at Different Levels of Initial Ability

	Pre-test	Post-test	95% confidence interval for post-test scores
Pre-test = 9.00	9.00	10.37	9.67 – 11.06
Pre-test = 12.93	12.93	13.27	12.78 – 13.76
Pre-test = 16.84	16.84	16.17	15.48 – 16.86

Discussion

Based on the data, several implications become clear. In answer to the question, "What is the effect of tutoring on math scores for the Praxis I exam?", this study indicates that there is no practically meaningful overall effect, and accounting for age, ethnicity, gender, and number of math classes taken did not alter this finding. While this was surprising, a close review of the pre-test, the post-test, and the tutoring procedure provide understanding. Like the Praxis I exam itself, the pre-test and post-test was constructed with questions from different categories and difficulty levels. However, each category is also comprised of many subcategories, and each subcategory requires specific knowledge and skills. A test that would exhaustively cover all specific knowledge and skills would be far too long to be reliable. Thus, different versions of Praxis exams are not simply different versions of the exact types of problems; rather, there is variation between tests as to the specific skills that are assessed. Because the tutoring program addressed only those specific problems that participants answered incorrectly on the pre-test, there was no guarantee that those same exact skills would be present on the post-test. Thus, tutoring likely improved math knowledge for specific concepts, but unsurprisingly this did not generalize to the broader categories. A true test of the effectiveness of a tutoring program such as this for specific skills would involve a post-test that assessed the same specific skills in the exact same manner; but this would not show the effectiveness for Praxis preparation, rather simply the effectiveness of tutoring.

One finding of interest was that pre-test achievement interacted with the tutoring effect. Specifically, students who scored in the mid-range of the pre-test might potentially benefit the most from tutoring as a small effect might be enough to push them past the threshold, while students who scored on the low end of the pre-test would not likely receive enough benefit to push them over the threshold and those who scored on the high end showed no significant effects, likely because there were fewer opportunities to learn. This finding is very meaningful for students preparing for the Praxis I exam and for educators helping to prepare

students for the exam. Thus a direct implication is that a short tutoring program will likely not be effective for students of relatively low math achievement, as there is not enough time to cover the breadth of topics that would have to be addressed. In contrast, students of high math achievement would likely not benefit from tutoring, and should be encouraged to simply take the exam. Only those students in the middle range of math achievement would be likely to benefit from this type of tutoring program, as their needs are limited, and a short session addressing some of these areas might be sufficient to enable them to pass the exam.

For schools of education that have pre-education students (students who have not yet taken the Praxis I exam and have not yet been accepted into the major), this study has particular relevancy. Faculty and staff working with these pre-education majors could conduct pre-tests to identify the needs of their students. If a student scores low on an initial pre-test, limited tutoring will likely not be sufficient to help the student pass the exam, and more comprehensive instruction should be pursued (possibly in the form of a remedial math course) in order to develop the necessary math competence. Because the Praxis I covers a broad array of categories and sub-categories, pre-tests should be comprehensive enough to be diagnostic, providing an outline of specific strengths and weaknesses. Students could then select the course or courses that best fit their needs. Ideally, because needs will likely vary greatly between students, a guided program that employs free online resources, such as the Khan Academy, would limit costs and provide the supports needed for growth of mathematical knowledge.

At the University of Wisconsin-Milwaukee, we often find that most of the students we see in the ERC turn to us for help after they have failed the Praxis I test. When we meet with the students we have them complete the pre-test. This, along with the test information from their failed Praxis exam, gives us some baseline information on the student seeking help. Based on this information, we can make suggestions to the students on the best way to prepare for the exam. How much more effective could our program be if it were incorporated into the pre-education curriculum? This study provides us, and can provide others, with a better sense of what types of support programs will be most effective.

Limitations and Future Research

One limitation of the current study was the limited sample of members of different ethnicities and age ranges. Limited representation did not allow investigation of potential differences in the effectiveness of the tutoring program for members of different ethnic groups. It remains to be seen whether or not a tutoring program such as this or tutoring programs in general differ in effectiveness based on ethnicity. Limited age representation prohibited a similar investiga-

tion for members of different age groups; and observed group differences and correlations between demographic variables and pre-test scores suggest more work needs to be done in these areas.

A second limitation is that only one type of tutoring program was explored. While cost-effective, results suggest that this type of intervention is not sufficient for improvement. Because programs such as these are costly to start and support, further investigations should examine what types of programs (e.g., comprehensive remediation, guided self-study, existing college courses) are most effective in meeting the needs of a diverse student population. It may be that those with moderate math achievement would benefit most from a guided self-study program, while those whose math achievement is low would benefit most from comprehensive remediation. It remains to future work to determine what is effective for whom, and how opportunities for students to develop their math skills are best delivered.

References

Broughman, S., & Rollefson, M. (2000). Teacher supply in the united states: Source of newly hired teachers in public and private schools: 1987-88 to 1993-94. *Education Statistics Quarterly, 2*(3), 28-32.

Bowen, B. (2002). Teacher testing: Advice for faculty in literature, rhetoric and creative writing. *The English Journal,* 34(2) 127-135.

Center for Education Reform. Retrieved from: http://www.edreform.com/.

Educational Testing Service (2011). *The Praxis series.* Retrieved from: http:/www.ets.org/praxis/institutions/faq/.

Gitomer, D., Latham, A., & Ziomek, R. (1999). Generalizations in teacher education:Seduction and misleading. *Journal of Teacher Education, 51*(3) 215-20.

Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (2004). The revolving door. *Education Next, 4*(1) 76-82.

Mitchell, K. J., Robinson, D. Z., Plake, B. S.and Knowles, K. T., (Eds.) (2001). Testing teacher candidates: The role of licensure tests in improving teacher quality. National Academy of Sciences. Retrieved from http://www.nap.edu/catalog.php?record_id=10090.

Rowan, B., Correnti, R. & Miller, R. (2002). What large-scale research tells us about teacher effects on student achievement: Insights from the prospects study of elementary schools. *Teacher College Record, 104*(8), 1525-1567.

Wright, S., Horn, S. & Sanders, W. (1997). Teacher and classroom context effects on student achievement: Implications for teacher evaluation. *Journal of Personnel Evaluation in Education, 11,* 57-67.

BOOK REVIEW:
Test Success!: How to Be Calm, Confident, and Focused on Any Test

REVIEWED BY KIMBERLY A. BETHEA
UNIVERSITY OF MARYLAND

In *Test Success: How to Be Calm, Confident & Focused on Any Test*, Ben Bernstein presents nine essential tools individuals can use to reduce stress and perform well on tests. The book is geared toward anyone who dislikes taking tests or who suffers from test anxiety or poor self-confidence related to test taking. Bernstein points out that his goal is not to get readers to like tests but to perform well on them. While there is a plethora of test preparation books on the market that help familiarize test takers with test format and test content, few of them help students deal with stress often associated with preparing for and taking tests. The information shared by Bernstein is relevant to test takers of all ages from high school students to working professionals.

Bernstein presents the book as a toolbox and views himself as a performance coach who will help readers fix their problems with testing by ensuring that they know what tool to use and when to use it. Readers may approach the book by reading straight through or by reading selected chapters found to be relevant to them based on the results of a trouble shooting diagnostic provided in the book. The book is divided into ten chapters and begins by explaining the causes of stress. Bernstein challenges long held beliefs about test stress by stating that there are pleasant, unpleasant, or neutral reactions to outside events and these reactions are what cause stress not the events themselves. The unpleasant reactions can typically be categorized as physical tension, negative thinking, and continual distraction. These reactions cause one to disconnect or push away from test preparation or the actual test. Bernstein asserts that one can disconnect through body (physical tension), mind (negative thinking), and spirit (continual distraction from the goal). These means of disconnection lead to Bernstein's model for test success.

Because disconnection can occur through the body, mind or spirit, Bernstein states that to counter disconnection one must have a calm body, a confident mind, and a focused spirit. If these three

For more information contact: Kimberly A. Bethea | Learning Assistance Service | University of Maryland, 2202 Shoemaker Building, College Park, MD 20742 | Telephone: 301.314.7701| Fax: 301.314.9206 | e-mail: kbethea@umd.edu

elements are implemented simultaneously, a natural, powerful triad is formed. A three-legged arrangement is considered the sturdiest of all structures and consequently, a three-legged stool represents Bernstein's model for successful test taking. In order for a three-legged stool to work effectively, all three legs must be equally strong. The next three chapters in the book provide the tools necessary to strengthen each area of the stool – body, mind, and spirit. The Bernstein Performance Inventory (BPI) is introduced and used to help readers assess their strengths in each area and their performance under pressure to give them a starting point for moving forward.

The chapter entitled *How to Calm Down* focuses on the first leg of the three-legged stool, body. Bernstein shares three ways to disconnect physically or in body and strategies to use to stay in the present and avoid being swept into tension and anxiety. The second leg of the three-legged stool, mind, is addressed in *How to Be Confiden*t. Bernstein reminds the reader that negative statements lead to disconnection from the positive side of the mind causing stress. The chapter shares three tools for building self-confidence. The final leg of the three-legged stool is addressed in the *How to Stay Focused* chapter. Bernstein connects the ability to focus to one's spirit or highest purpose. This allows one to see that distractions are a manifestation of a disconnection from the goal. Again strategies are provided for staying focused and the reader is reminded of the importance of cultivating his or her awareness of becoming distracted.

Once the nine essential tools are developed using the three-legged stool model, Bernstein recommends strategies for dealing with many types of tests including paper tests, computerized tests, oral exams, practical exams, and performances as well as suggestions for working effectively with test prep books and personal test coaches. In the *Working the Model* chapter, Bernstein summarizes his model by showing the relationship between the three domains (legs of the three-legged stool), the best state of being for each domain, and the three tools for each domain. One of the final two chapters is for parents and provides information about how parents may be contributing to their children's test stress and ways to alleviate their own stress. The final chapter, *For Teachers*, proposes strategies teachers might use to eliminate stress in their lives. There is also a book website that provides an overview of the book, information for various constituencies about the book and its relevance to them, and blogs and articles about test anxiety and stress. On the website, readers can print out the checklists and inventories discussed in the book.

The strength of this book is in the three-legged stool model it presents for dealing with test stress. The model considers a person as a whole—mind, body, and spirit—and looks at what causes stress in each of these areas then provides strategies for addressing these causes. There are many books available that deal with test anxiety, however, the approach taken here with references to the three-legged stool model (Chapter 3), the bull's-eye representation for remaining in the present

moment (page 162), and the idea of cultivating one's awareness of disconnection (Chapter 2) from a test and test preparation is refreshing. While the book provides beneficial strategies for dealing with test stress, many of the techniques seem more appropriate for therapists or psychological counselors instead of learning skills professionals. For example, it is unlikely that during an individual or group student meeting, a learning skills professional would have students do the Circle of Light activity (page 152) or the Three-Way Mirror activity (page 126). However, these and other exercises presented in the book can be appropriately modified for use by learning skills professionals or anyone else. Some readers might be uncomfortable with Bernstein's use of the word "spirit" throughout the book, but I felt he sufficiently explained what he means by "spirit" and I was not bothered by its use.

Bernstein makes a couple of explicit allusions to research in the book (page 97 and page169) but he does not provide the details of such research. While he states in the introductory chapter that the program presented in the book is a product of his forty years as a teacher and psychologist, these beliefs were likely shaped by theory and his strategies would be even more convincing if substantiated by research. Nonetheless, the lack of a stated theoretical foundation and empirical research-based support of the strategies presented do not totally diminish their value since some of the suggested strategies are among the best practices literature. Additionally, Bernstein's model is shown to be effective through anecdotal evidence shared by people who have used it. While Bernstein notes early in the book the importance of content knowledge in test success, it would have been helpful to revisit this topic later in the book to remind readers that the suggested strategies will not work if they are not prepared for the test with an understanding of the content.

Chapters four through seven might be the most useful for learning skills professionals as these chapters provide specific strategies for calming the body down, improving self-confidence, and staying focused. Chapter seven provides a laundry list of strategies to be used on various types of tests but some could be more fully developed like the section on study buddies. The readers must keep in mind that the strategies listed in chapter seven may not be intended to be comprehensive. The focus seems to be on the possible causes of stress in various test settings and how to deal with disconnection from the test in these settings. The chapter for parents is well written and helps parents not only see how they may foster test stress in their children but also prepares parents to deal with stress in their own lives. The chapter written for teachers might be more useful if it focused on equipping teachers with tools they can use in the classroom setting to help their students deal with stress.

While reading the book, I learned new strategies that I will incorporate into my work with students. I also clarified my understanding of how to use stress reducing techniques and why they work and I suspect other learning skills professionals may do so as well. I also appreciated that

the recommended strategies require users to employ an actual process and not just sure will power. For example, the Stopping the Distraction exercise (page 108) teaches a process for cutting off the distraction and focusing on the goal instead of just saying "you must concentrate."

What I like most about Bernstein's strategies is their connection to our broader lives beyond test taking. My two favorite statements in the book are "…in the end they [thoughts] determine the course of our lives" (page 118) and "It is our experiences and the way we deal with them that shape us into what we are (page 158)." He asserts that life is a series of trials or tests and that without experiencing trials or tests, we would not grow become stronger, more skillful or more experienced. He challenges the reader to consider how he or she faces tests and to accept these tests as opportunities to grow.

Bernstein's approach to achieving test success is beneficial to test takers in various spheres from high school to college to working professionals. The comprehensive approach to dealing with the causes of test-related stress help readers prepare for successful experiences with test preparation and test taking. The straightforward language of the book makes it a quick read and having the opportunity to pin point specific areas of concern makes using the book even easier. Learning skills professionals will no doubt find this book valuable in their work supporting student success. I believe it is a good personal library addition.

The Effect of Supplemental Instruction on Transfer Student Succeess in First Semester Calculus

MARK BONSANGUE, TODD CADWALLADEROLSKER, CATHY FERNANDEZ-WESTON, MARK FILOWITZ, JAMES HERSHEY, HYE SUN MOON, CHRIS RENNE, ED SULLIVAN, SEAN WALKER, ROCHELLE WOODS

CALIFORNIA STATE UNIVERSITY, FULLERTON

NICOLE ENGELKE

WESTER VIRGINIA STATE UNIVERSITY

Abstract

This study focused on the impact of Supplemental Instruction (SI) on student achievement in first semester Calculus for transfer students over a three-year period. Transfer students participating in SI achieved dramatically higher passing rates and course grades than did non-SI transfer students, despite no significant differences in academic predictors between the two groups. The results here indicate that while SI has been shown to be an effective tool for many students, the academic and social elements of SI may be especially significant for STEM transfer students enrolled in gateway courses such as first semester Calculus.

Introduction

Nearly thirty-five years ago, University of California Berkeley sociologist Lucy Sells (1978) coined the term "critical filter" to describe required mathematics courses as being gateways to keeping students out of mathematics-based fields. These two powerful words have continued to be at the heart of a national conversation among those concerned with the marginalization of groups of students out of

For more information contact: Martin V. Bonsangue | Professor of Mathematics | California State Univeristy, Fullerton | 800 No. State College Blvd. | Fullerton, CA 92831 | Telephone: 657.278.2728 | e-mail: mbonsangue@fullerton.edu |

mathematics-based disciplines (e.g. Astin, 1997; Drew, 1996, 2011; Pascarella & Terenzini, 1991, 2005; Tinto, 1994, 2012; Tobias, 1990). In particular, transfer students who major in science, technology, engineering, and mathematics (STEM) fields are often discouraged by the hierarchical curricula that can prevent students from earning a degree in a timely way. In addition, the "culture shock" of attending a new – and often much larger – institution can have an adverse effect on student achievement, particularly during the first year at the four-year institution (Astin, 1997; Drew, 2011; Tinto, 2012).

Since the late 1970s, supplemental instruction (SI) has been used to help support student success in courses that have traditionally had high non-success rates, where success is defined as a grade of C or higher, with non-success being any other grade outcome. Developed at the University of Missouri, Kansas City (UMKC, 2012), the goal of SI is to improve retention and success of undergraduates who will enter STEM careers. Further, SI aims to reduce the achievement gap between groups of students who have traditionally been underrepresented in the STEM fields (e.g, Bonsangue, 1994; Treisman, 1985). Supplemental instruction is neither tutoring nor having students do extra recitation assignments. Rather, students work in structured collaborative groups on challenging problems based on timely material presented in their lecture classes. An undergraduate student, with strong communication skills and understanding of the content, leads the SI sessions. This is a central element of the program, since students are often more apt to reveal their course weaknesses to a peer than to a professor. SI leaders often attend the professor's lecture each day to ensure that their SI sessions are current and to act as a role model for students in the course. SI leaders then meet with students at least three hours per week to creatively work on problems and study skills based on that week's lessons in a highly interactive setting (Hurley et. al., 2006).

A number of studies have documented the effectiveness of SI in college and university- level STEM disciplines, including biology (Rath et. al., 2007); chemistry (Gosser & Roth, 1998; Lewis & Lewis, 2005; Rath et. al., 2012); physics (Hake, 1998), and mathematics (Fayoski & Macmillan, 2008). Other studies have shown positive SI impacts in developmental biology courses (Moore & LeDee, 2006) as well as other "barrier" courses (Bronstein, 2008; Henson & Shelley, 2003; Mason & Verdel, 2001). Moreover, there is evidence that SI can have positive effects on students' self-efficacy and performance in STEM majors long after the SI-based course has ended (Bonsangue & Drew, 1995; Gattis, 2000).

Supplemental Instruction at CSUF

California State University Fullerton (CSUF) is a large urban commuter institution comprised of more than 35,000 students. Its diverse student body is evidenced by the fact that there is no ethnic majority group. More than one-third of all upper-division students come to CSUF

as transfers. While the size of CSUF is a positive factor in providing a variety of program offerings, it also can be a negative factor from the student's point of view, especially for students new to the institution, including first-time freshmen and transfer students. At a large school such as CSUF, it may be difficult for students to meaningfully connect with faculty, students, and programs. This disconnection has been identified as a key factor in student attrition (e.g., Astin, 1997; Tinto, 1994).

To help strengthen academic achievement in STEM, as well as to help students feel more connected academically, in 2008 CSUF implemented four SI sections in first semester Calculus and Evolution and Biodiversity, modeled after the University of Missouri-Kansas City SI program. In Spring 2009, ten SI workshop sections were offered in these courses as well as Pre-Calculus and second semester Calculus. For Fall 2009 additional courses were added, including Organic Chemistry I and College Algebra, bringing the total number of SI workshops to 17. Organic Chemistry II and Physical Chemistry II were added in Spring 2010, and SI workshops increased to 20 sections. The program continued to gain momentum in Fall 2010. SI workshops increased to 35 and added courses, incorporating Cellular Basis of Life and three gateway Computer Science courses: Introduction to Programming; Programming Concepts; and Data Structure Concepts. In Spring 2011, CSUF fielded 39 SI sections, all entirely funded by external grants. Through the end of the Spring 2011 semester, approximately 3,000 students have been involved in one or more sessions of the SI workshops at CSUF.

This study focuses on the achievement of students taking first semester Calculus and the impact of supplemental instruction in this course. The data were gathered as part of the reporting on SI to granting agencies and institutional assessment of the program. No specific groups of students, other than by SI participation status, were targeted in the study.

Sample All Students

A total of 589 students majoring in a STEM discipline who were enrolled in first semester Calculus during the six semesters from Fall 2008 through Spring 2011 were included in the study. Of these, 297 students were SI participants (treatment group) and 292 students were non-participants (control group). The control group was chosen using systematic sampling of students in the same sections of first semester Calculus as the SI participants.

In the treatment (SI) group, 161/297 (54.2%) were identified by the university as having underrepresented minority (URM) status, including African-American, Hispanic/Latino, Native American, and Pacific Islander students; 136/297 (45.8 %) were identified as non-URM (including white/non-Hispanic and Asian students). In the control (non-SI) group, 126/292 (43.2%) were URM students, while 166/292 (56.8 %) were

non-URM students. In addition, 132/297 (44.4%) of the students in the treatment group were women, compared with 89/292 (30.5%) of the students in the control group. Moreover, 136/302 (45.0%) of the non-URM students participated in SI, while 161/287 (56.1%) of the URM students participated in SI. Table 1a provides SI and non-SI participation frequencies by sex and URM status for all students.

Table 1a: SI and non-SI Participation by Sex and URM Status, All Students

		SI Non-Participant	SI Participant	Total
Non-URM	F	49	51	100
	M	117	85	202
	Total	166	136	302
URM	F	40	81	121
	M	86	80	166
	Total	126	161	287
Total	F	89	132	221
	M	203	165	368
	Total	292	297	589

Table 1b: SI and non-SI Participation by Sex, URM Status, and Transfer Status

		SI Non-Participants		SI Participants		Total	
		Native St.	Trans. St.	Native St.	Trans. St.	Native St.	Trans. St.
Non-URM	F	37	12	45	6	82	18
	M	99	18	66	19	165	37
	Total	136	30	111	25	247	55
URM	F	36	4	75	6	111	10
	M	80	6	77	3	157	9
	Total	116	10	152	9	268	19
Total	F	73	16	120	12	193	28
	M	179	24	143	22	322	46
	Total	252	40	263	34	515	74

Native Students and Transfer Students

   The data from Table 1a was broken down by transfer status, with each student identified as a having transfer status or non-transfer (native) status. Thirty-four of the 297 students (11.4%) in the treatment group and 40 of the 297 students (13.5%) in the control group enrolled in first semester Calculus were identified as transfer students. For the treatment (SI) group, 9/34 (26.5%) were URM students. For the control (non-SI) group, 10/40 (25.0%) were URM students. In addition, 12/34 (35.3%) of the students in the treatment group were women, compared with 16/40 (40.0%) of the students in the control group. Moreover, 25/55 (47.5%) of the non-URM students participated in SI, while 9/19 (47.4%) participated in SI. T1b provides SI and non-SI participation frequencies separately by sex and URM status for native students and transfer students.

Method

   Using a standard 4 point scale, grade points were quantified as follows: A+=4.0; A=4.0; A-=3.7; B+ = 3.3; B = 3.0; B-=2.7; C+=2.3; C=2.0; C-=1.7; D+=1.3; D=1.0; D-=0.7; F or WU (unauthorized withdrawal)=0.0. Students who withdrew from the course during the allowed withdrawal period were not included in the results. Success in the course was defined as a grade of C (not C-) or higher; non-success was defined as any other grade outcome. All data was taken directly from university records from the Office of Institutional Research and Analytical Studies.

Results

Native Students

   Table 2a lists mean course grade, success rate, and high school grade point average (HSGPA) for native students by URM status and SI participation. Significant differences in grade outcomes between treatment and control groups were observed: 76.4% of the students in the treatment group were successful in the course compared to 49.3% of the students in the control group ($t > 2.0$, $p < .01$). In addition, students in the treatment group had a mean course grade of 2.28, while students in the control group had a mean course grade of 1.53. No significant difference was noted between the treatment and control groups for high school grade point average ($p < 0.5$, $t > .30$).

These differences were also noted when controlling for URM status. Among non-URM students, native SI participants had a success rate more than 20% higher than did non-SI students and a grade difference of two/thirds of a grade point ($t > 2.0$, $p < .01$). Among URM students, SI

participants had a success rate 35% higher than that achieved by non-SI students and a grade difference of more than nine-tenths of a grade point (t>2.5, p<.005). As before, no significant differences were noted between the treatment and control URM and non-URM groups for high school grade point average (p<0.5, t>.30). No significant differences were noted between men and women in either success rate or mean course grade within all groups.

Table 2a: First Semester Calculus Results by SI and URM Status, Native Students						
URM Status	SI Partic.	n	Success Rate	Course Grade	HS GPA
Non-URM	Non-partic.	136	58.4%	1.74	3.11
	Participant	111	80.6%	2.41	3.18
	Total	247	68.7%	2.04	3.14
URM	Non-partic.	116	37.5%	1.26	3.20
	Participant	152	73.3%	2.17	3.26
	Total	268	57.5%	1.80	3.24
Total	Non-partic.	252	49.3%	1.53	3.15
	Participant	263	76.4%	2.28	3.23
	Total	515	62.3%	1.91	3.19

Table 2b: First Semester Calculus Results by SI and URM Status, Transfer Students						
URM Status	SI Partic.	n	Success Rate	Course Grade	TRGPA
Non-URM	Non-partic.	30	57.7%	1.82	3.02
	Participant	25	76.0%	2.40	2.94
	Total	55	65.5%	2.08	2.98
URM	Non-partic.	10	20.0%	0.66	2.92
	Participant	9	88.9%	2.30	3.01
	Total	19	52.6%	1.44	2.96
Total	Non-partic.	40	45.0%	1.43	3.00
	Participant	34	79.4%	2.40	2.96
	Total	74	60.8%	1.87	2.98

Transfer Students

Table 2b lists mean course grade, success rate, and transfer grade point average (TRGPA) for transfer students by URM status and SI participation. As before, significant differences in grade outcomes between treatment and control groups were observed: 79.4% of the students in the treatment group were successful in the course compared to 45.0% of the students in the control group (t>2.0, p<.01). In addition, students in the treatment group had a mean course grade of 2.40, while students in the control group had a mean course grade of 1.43. No significant difference was noted between the treatment and control groups for transfer grade point average (p<0.5, t>.30).

These differences were even more pronounced when controlling for URM status. For non-URM transfer students, SI participants again had a success rate 20% higher than that achieved by non-SI students and a grade difference of about two/thirds of a grade point higher (t>2.0, p<.01). For URM students, 8 of the 9 SI participants (89 %) were successful, posting a combined mean course grade of 2.30. However, only 2 of the 10 URM non-participants (20 %) were successful, posting an aggregate mean course grade of 0.66.

No significant differences were noted between men and women in either success rate or course grade within the control group. A borderline difference (t>1.5, p<.07) in mean course grade was observed between men (2.58) and women (2.08), but not in success rate (82% v. 75%). Due to the small sample size of these subgroups, tests of significance should be used and interpreted with caution.

Analysis

As stated earlier, students in the sample were identified on a number of characteristics, including URM identification, sex, and transfer status. Although transfer students were not initially the point of focus, the data suggested that this group of students might warrant further analysis. Therefore, the data for transfer students was disaggregated from the data for all students to make a meaningful comparison of achievement in first semester Calculus by SI, URM, and transfer status. Figure 1a shows the mean aggregate course grade for non-transfer (native) students by SI and URM status. While not a time-based graph, the lines are helpful for visualizing possible impact from SI participation for the treatment group of students on "closing the achievement gap" between URM and non-URM students. Similarly, Figure 2a shows the overall success rate in first semester Calculus for native students by SI and URM status.

Using the data from Table 2b, Figures 1b and 2b give a similar line graph comparison of mean course grade and success rates by SI and URM status for transfer students.

Figure 1a:

First Semester Calculus Grade by SI and URM Status, Native Students
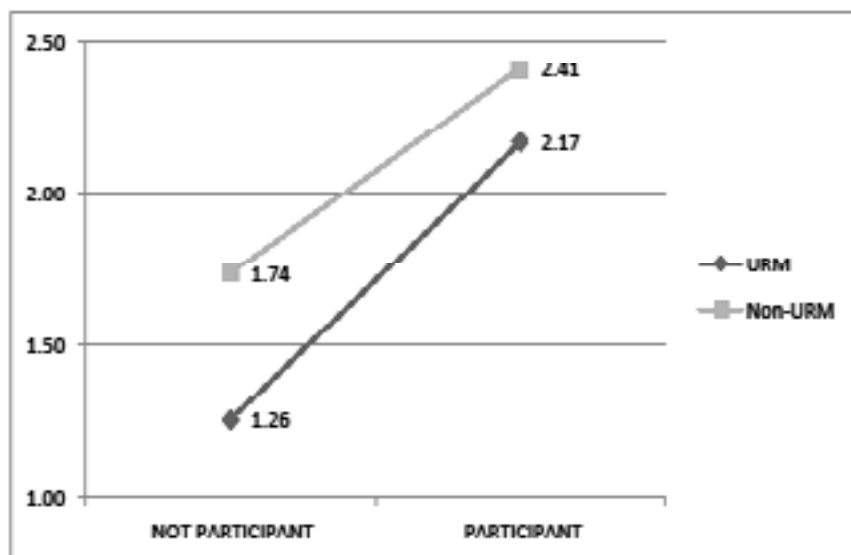
Figure 2a:
First Semester Calculus Success Rate by SI and URM Status, Native Students
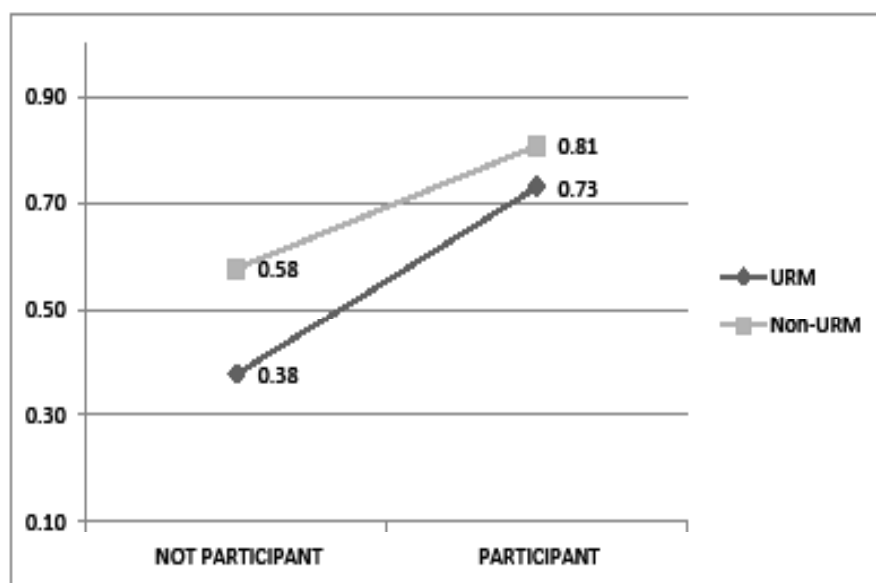
Figure 1b:
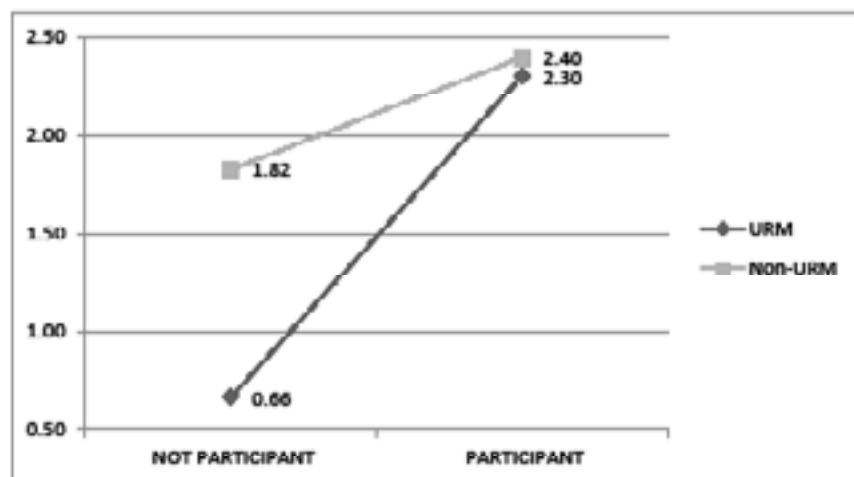First Semester Calculus Grade by SI and URM Status, Transfer Students
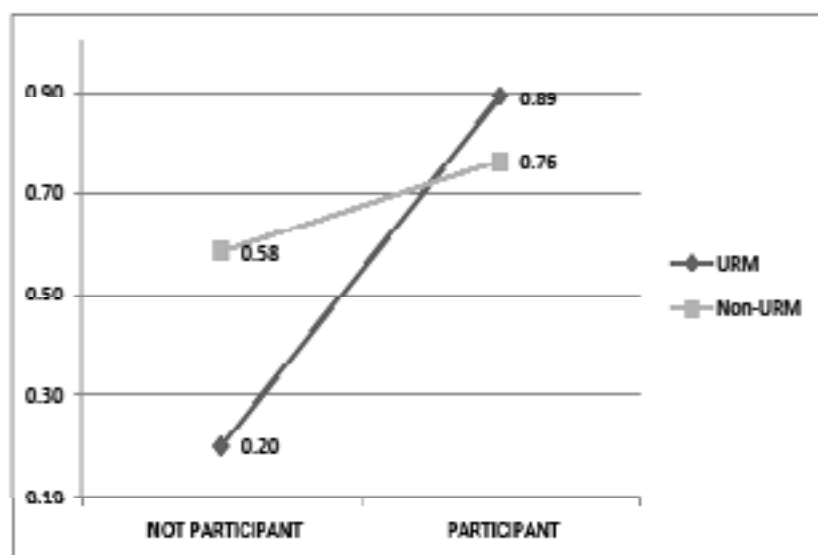

Figure 2b:
First Semester Calculus Success Rate by SI and URM Status, Transfer Students

The data presented here show that there were significant differences in course achievement between SI and non-SI students for both native students and transfer students. Indeed, figures 1b and 2b illustrate the pronounced differences that were observed for transfer students, and, in particular, for URM transfer students. While being mindful of the limited sample size, the data showed that participation in SI was linked with substantial increases in course grade and success rates for transfer students. Indeed, among transfer students participating in SI, the difference in mean course grade for URM and non-URM students (2.30 v. 2.40) was negligible, while URM transfer students actually achieved a higher overall success rate (89%) than did non-URM transfer students (76 %).

Discussion

A rich educational literature has identified predictors of success in college in general and in STEM majors, in particular. These academic variables include high school GPA, transfer GPA, SAT-M, previous mathematics courses taken, and grade in first math course taken at college have been identified as potentially contributing factors. Non-academic variables, including sex, underrepresented minority status, socio-economic status, and first generation college status have also been identified as having predictive power of student performance in college (Astin, 1997; Drew, 2011; Pascarella & Terenzini, 2005; Tinto, 2012).

Participation in intervention programs, such as supplemental instruction, is typically based on student choice rather than random assignment to specific course sections that had an SI component. The SI literature has identified bias issues in self-selection in SI participation (Gattis, 2002). While self-selection effects cannot nor should not be ignored, there is nonetheless evidence of the impact of programs such as SI. When controlling for both academic and SES factors, SI has been

linked with substantial, and sometimes profound, value-added effects. Treisman (1985) found that African-American native students at UC Berkeley significantly outperformed non-URM native students when controlling for socio-economic status, HSGPA, SAT-M, and high school class rank. In a longitudinal study of native students at California Polytechnic State University - Pomona, Bonsangue (1994) and Bonsangue and Drew (1995) found that participation in SI in first semester Calculus was linked with increased timely graduation in engineering majors, especially for women students, despite significant differences in SAT scores and HSGPA favoring non-SI students. In a regression analysis, the only variable that was significantly linked to successful completion of all mathematics prerequisite courses, including two years of Calculus, was SI participation, explaining more than 50% of the variation in prerequisite mathematics completion (Bonsangue, 1994). A more recent study by Fayoski and Macmillan (2008) reported similar results in a first-year Calculus course.

While these studies have provided evidence of SI impact on student success in Calculus courses, they have generally focused on native (non-transfer) students. Although not initially focused on transfer students, the present study found evidence of significant differences in achievement in first semester Calculus for transfer students participating in a robust supplemental instruction program. These differences were even more pronounced for underrepresented minority students. The study was not designed to detect or account for self-selection; therefore, it is not known if self-selection factors would account for these differences. Indeed, such specific designs could have serious limiting effects on both the sample size and makeup since a specific group would have been "targeted" for recruitment. As discussed earlier, the SI program at CSUF focuses on courses with traditionally high non-success rates rather than on particular groups of students enrolled in those courses.

Based on data that was obtainable from institutional records, the current study found no differences in transfer GPA between transfer students participating in SI and their non-SI counterparts. Furthermore, there were no differences in transfer GPA between SI and non-SI students for any subgroup by URM or gender status. Since fewer than half of the transfer students at CSUF take the SAT, this variable was not considered. SES variables were not specifically measured, although these have been linked with URM status (Tinto, 2012) which was identified in the present study.

Exit surveys completed by SI students showed that most students participating in SI felt that SI had a positive impact on their academic performance. Indeed, more than 90% of SI students surveyed agreed or strongly agreed that SI participation was helpful. Moreover, more than half of the non-SI students indicated that the reason they did not participate in SI was because of schedule conflicts rather than for academic reasons. In trying to minimize response bias, the survey did not include ethnic, gender, or other personally identifying questions, including transfer status. Thus, the extent to which the positive self-reported impact of SI applies to transfer SI students is unknown.

The literature on transfer student issues suggests that the academically and socially inclusive experience of SI participation is at least as salient for transfer students as native students. The results from the present study strongly support this notion and underscore the importance of the community college in the education of many college students, including those majoring in STEM. For example, at Cal State Fullerton, more than half of all upper-division students are transfer students, with the overwhelming majority transferring from the community college system. Moreover, this ratio is not unusual for large urban, comprehensive universities. Thus, high-impact practices such as SI may be a key element in the retention and success of transfer students, especially in key gateway courses.

Summary and Recommendations

This study found evidence that over a five-semester period, transfer students who participated in SI in first semester Calculus were far more successful that transfer students who did not. Transfer students participating in the program had a success rate of nearly 80 % compared with 45 % for transfer students not participating and posted a mean grade, 2.40, of nearly one full grade point higher than non-participants. Differences in course achievement between underrepresented minority students and non-URM students in first semester Calculus performance were pronounced for non-SI transfer students, yet essentially disappeared between URM and non-URM transfer students participating in SI.

While not initially targeting transfer students, this study may help contribute to the discussion of issues affecting transfer students, and especially those majoring in STEM disciplines. Programs, such as supplemental instruction, that build community based on common academic goals can have a significant impact on student achievement, especially in initial experiences in gateway mathematics and science courses for STEM majors. In general, students who are successful in their initial mathematics course are much more likely to complete a STEM degree than those who are not initially successful (e.g., Tinto, 2012). The present study suggests that this first-time experience may be critical for transfer students as well as for native students.

Based on the results discussed here, there are three recommendations that academic departments and/or STEM support programs that have SI or similar support structures may wish to consider implementing. First, incoming transfer students should be contacted prior to enrolling in STEM classes. It may be especially effective to have current upper-division STEM students make this contact via telephone, email, and/or instant messaging, to inform incoming transfer students about SI (or other) support structures that are available to them and to personally usher them into these programs. Second, recruit and enroll transfer students vigorously during the first two weeks of classes into SI programs, including classroom visitations by SI leaders or other STEM students who can serve as accessible contact persons. And third, maintain a database to track the progress of transfer students in initial STEM courses. This information would allow departments and/or programs to do timely interventions with the transfer students, as well as provide accurate and up-to-date data for reporting purposes to granting agencies or institutional funding sources. By proactively creating and maintaining effective support structures for gateway STEM courses, academic departments may help increase their own awareness of and responsibility to all students wishing to participate in a STEM field. Indeed, CSUF is working more closely now with its Transfer Center to help identify and enroll transfer students into SI courses as students or even as facilitators.

There are limitations to this study. The number of transfer students enrolled in first semester Calculus (74) was, while not trivial, limited. Specifically, the impact of SI on underrepresented minority transfer students remains more anecdotal than statistical based on the limited sample size. Variations in pre-transfer experience, such as number of semesters completed prior to transferring or initial mathematics course taken in college, were not considered.

Despite these constraints, this is the first study to our knowledge that has reported on the academic performance of this specific group – transfer students in STEM majors – and the impact that supplemental instruction can have on these students' academic success. Clearly, more research is needed to explore if the trends observed here remain apparent in other institutions and other contexts. Even with the limitations identified, this study documents that effective intervention programs can strengthen academic achievement of STEM transfer students.

References

Astin, A. (1997). What matters in college: Four critical years revisited. San Francisco: Jossey-Bass.

Bonsangue, M. (1994). An efficacy study of the calculus workshop model. CBMS Issues in Collegiate Mathematics Education, Volume 4, American Mathematical Society, 117–137.

Bonsangue, M., and Drew, D. (1995). Mathematics: Opening the gates - Increasing minority students' success in calculus. In J. Gainen and E. Willemsen, Eds., Fostering Student Success in Quantitative Gateway Courses, Jossey-Bass Series, "New Directions for Teaching and Learning," 61, San Francisco, 23–33.

Bronstein, S. B., (2008). Supplemental instruction: Supporting persistence in barrier courses. Learning Assistance Review, 13(1), 31–45.

Drew, D. (1996). Aptitude revisited: Rethinking math and science education for America's next century. Baltimore: Johns Hopkins Press.

Drew, D. (2011). STEM the Tide: Reforming science, technology, engineering, and math education in America. Baltimore: Johns Hopkins Press.

Fayowski, V, and MacMillan, P.D., (2008). An evaluation of the Supplemental Instruction programme in a first year calculus course. Journal of Mathematics Education in Science and Technology, 39(7), 843–855.

Gattis K. W., (2000). Long-term knowledge gains due to Supplemental Instruction in college chemistry courses. Journal for Research in Developmental Education, 33(2), 118–126.

Gattis K. W., (2002). Responding to self-selection bias in assessments of academic support programs: A motivational control study of supplemental instruction. Learning Assistance Review, 7(2), 26–36.

Gosser Jr., D. K. and Roth, V. (1998). The workshop chemistry project: peer-led team learning. Journal of Chemistry Education, 75(2): 185–187.

Hake, R., (1998). Interactive engagement versus traditional methods: A six-thousand student survey of mechanics test data for introductory physics courses," American Journal of Physics, 66, 64–74.

Hensen, K. A. and Shelley, M. C., (2003). Impact of Supplemental In struction: Results from a large, public, Midwestern university, Journal of College Student Development, 44(2), 250–259.

Hurley, M., Jacobs, G., and Gilbert, M. (2006). "The Basic SI Model," In M. E. Stone and G. Jacobs (eds.), Supplemental Instruction: New Visions for Empowering Student Learning. San Francisco: Jossey-Bass, 11–22.

Lewis, S. E. and Lewis, J. E. (2005). Departing from lectures: an evaluation of a peer-led guided inquiry alternative. Journal of Chemistry Education, 82(1), 135–139.

Mason, D. and Verdel, E. (2001). Gateway to success for at-risk students in a large-group introductory chemistry class. Journal of Chemistry Education, 78(2), 252–255.

Moore, R. and LeDee, O., (2006). Supplemental instruction and the performance of developmental education students in an introductory biology course. Journal of College Reading and Learning, 36(2), 9–20.

Pascarella, E., and Terenzini, P. (1991). How college affects students: Findings and insights from twenty years of research. San Francisco: Jossey-Bass.

Pascarella, E., and Terenzini, P. (2005). How college affects students: A third decade of research. San Francisco: Jossey-Bass.

Rath, K. A., Peterfruend, A. R., Bayliss, F., Runquist, E., and Simonis, U., (2012). The impact of supplemental instruction in entry-level chemistry courses at a midsized public university, Journal of Chemistry Edu cation, 89(4), 449–455.

Rath, K. A., Peterfruend, A. R., Xenos, S. P., Bayliss, F., and Carnal, N. (2007). Supplemental instruction in introductory Biology I: Enhancing the performance and retention of underrepresented minority students. CBE–Life Science Education, 6, 203–216.

Sells, L. (1978). Mathematics: The critical filter. The Science Teacher, 45, 28–29.

Tinto, V. (1994). Leaving College: Rethinking the causes and cures of student attrition. Chicago: U. of Chicago Press.

Tinto, V. (2012). Completing college: Rethinking institutional action. Chicago: U. of Chicago Press.

Tobias, S. (1990). They're not dumb, they're different: Stalking the second tier. Minneapolis: U. Minn. Press.

Treisman, P. U. (1985). A study of the mathematics performance of black students at the University of California, Berkeley. Unpublished doctoral dissertation, Berkeley, California.

UMKC's Supplemental Instruction Program, SI Overview. http://www.umkc.edu/cad/umkcsi/overview.shtml (accessed August 2012).

Pertinent Publishing Parameters

The Learning Assistance Review (*TLAR*), the national peer reviewed official publication of the National College Learning Center Association (NCLCA), publishes scholarly articles and reviews that address issues of interest to learning center professionals (including administrators, teaching staff, faculty, and tutors) who are interested in improving the learning skills of postsecondary students. Primary consideration will be given to articles about program design and evaluation, classroom-based research, the application of theory and research to practice, innovative teaching and tutoring strategies, student assessment, and other topics that bridge gaps within our diverse profession.

Categories for Submission

Articles

- Topics: *TLAR* will accept manuscripts that address our purpose: to publish scholarly articles and reviews that address issues on program design and evaluation, classroom-based research, the application of theory and research to practice, innovative teaching and tutoring strategies, student assessment, etc.

- Types: *TLAR* will accept manuscripts for the following four of the article types outlined in the American Psychological Association Manual: empirical study and articles on review, theory, and methodology. Follow 6th edition APA manual (sections 1.01-1.04) for specific requirements and structure for each type; regardless, all manuscripts need a clear focus that draws a correlation between the study, review, theory, or methodology and learning assistance practices.

Joining the Conversation

- Idea Exchange: Discussion directly related to articles published in *TLAR*. Submissions are limited to fewer than 4 paragraphs and are to be constructive idea exchanges. In addition to the name, title, college, and contact information from the submitter, Idea Exchange submissions are to include the details of the referenced article (Title, author, and volume/number, and academic semester/year). A submission form may be found online on the *TLAR* website.

- Further Research: Article submissions that have a stated direct link to prior published *TLAR* articles. These articles will be considered following the manuscript submission guidelines.

Book Review

Book review requests should be accompanied with two copies of the book to facilitate the reviewing process. Potential book reviewers are urged to contact the editorial team for details.

Manuscript Guidelines

Manuscripts and reference style must be in accordance with the Publication Manual of the American Psychological Association (6th ed.). Submissions that do not comply with APA style will be returned to the author(s). Manuscripts must be original work and not duplicate previously published works or articles under consideration for publication elsewhere. The body of the manuscript may range in length from 10 to 20 pages, including all references, tables, and figures. Longer articles will be considered if the content warrants it. The authors are responsible for the accuracy of all citations and references and obtaining copyright permissions as needed. The only acknowledgments that will be published will be those required by external funding sources.

Submission Guidelines

Submission packets must include:
- A cover page
- The original manuscript
- A masked manuscript for review
- One hard copy of these materials must be mailed to the address listed below.
- An electronic copy must be submitted to the e-mail address listed below.
- The title page must include the title of the manuscript (not to exceed 12 words); the name(s) and institutional affiliation(s) of all authors.
- The lead author should also provide work and home addresses, telephone numbers, fax, and e-mail information.
- All correspondence will be with the lead author, who is responsible for all communication with any additional author(s).
- The second page should be an abstract of the manuscript, maximum 100 words.
- To start the reviewing process, the lead author will be required to sign certificate of authorship and transfer of copyright agreement. If the manuscript is accepted for publication, all author(s) must sign an authorization agreement.
- Figures and tables must be black and white and according to APA style.

Please send your comments and/or article submissions to: MichaelFrizell@MissouriState.edu with a hard copy to Michael Frizell, Editor, The Learning Assistance Review (*TLAR*)

> **Michael Frizell**
> **Director, Student Learning Services**
> **Bear CLAW (Center for Learning and Writing)**
> **Missouri State University**
> **Meyer Library, Room 112**
> **901 South National Avenue**
> **Springfield, MO 65897**
>
> **phone: 417-836-5006**
> **e-mail: MichaelFrizell@MissouriState.edu**

Review Process

Author(s) will receive an e-mail notification of the manuscript receipt. The review process may include a peer-review component, in which up to three members of the *TLAR* editorial board will review the manuscript. Authors may expect the review process to take about three months. Authors may receive one of the following reviewing outcomes:

(a) accept with minor revisions,
(b) revise and resubmit with only editor(s) review,
(c) revise and resubmit for second full editorial board review, and
(d) reject.

As part of the reviewing correspondence, authors will be electronically sent the reviewers' rankings and general comments on one document and all the reviewers' contextual markings on one manuscript. Manuscript author(s) must agree to be responsible for making required revisions and resubmitting the revised manuscript electronically by set deadlines. Manuscript author(s) must abide by editorial revision decisions.

Accepted manuscripts become the property of the National College Learning Center Association and may not be reprinted without the permission of the NCLCA. Authors relinquish ownership and copyright of the manuscript and may only distribute or transmit the published paper if copyright credit is given to NCLCA, the journal is cited, and all such use is for the personal noncommercial benefit of the author(s).

NCLCA Membership Information

What is NCLCA?

The National College Learning Center Association (NCLCA) is an organization of professionals dedicated to promoting excellence among learning center personnel. The organization began in 1985 as the Midwest College Learning Center Association (MCLCA) and went "national" in 1999, changing the name to the National College Learning Center Association (NCLCA) to better represent its nationwide and Canadian membership. NCLCA welcomes any individual interested in assisting college and university students along the road to academic success.

NCLCA defines a learning center as a place where students can be taught to become more efficient and effective learners. Learning Center services may include tutoring, mentoring, Supplemental Instruction, academic and skill-building labs, computer-aided instruction, success seminars and programs, advising, and more.

Join NCLCA

NCLCA seeks to involve as many learning center professionals as possible in achieving its objectives and meeting our mutual needs. Therefore the NCLCA Executive Board invites you to become a member of the Association.

The membership year extends from October1 through September 30. The annual dues are $50. We look forward to having you as an active member of our growing organization.

Membership Benefits

    A. A subscription to NCLCA's journal, *The Learning Assistance Review*
    B. Discounted registration for the Fall Conference and and for the Summer Institute
    C. Regular issues of the *NCLCA Newsletter*
    D. Voting Priveleges
    E. Opportunities to serve on the Executive Board
    F. Special publications such as the Resource Directory and the Learning Center Bibliography
    G. Opportunities to apply for professional development grants
    H. Access to Members Only portion of the website
    I. Announcements of other workshops, in-services, events, and NCLCA activities

Membership Application

On-line membership application or renewal available with PayPal payment option at: http://www.nclca.org/membership.htm. Contact Membership Secretary to request an invoice if needed.

OR

Complete the information below and send with your $50 dues payment to the NCLCA Membership Secretary. Be sure to check whether you are a new member or are renewing your membership. If you are renewing your membership, please provide updated information.

Please check one: ☐ New member ☐ Membership renewal

Name

Title

Institution

Address

City

State/Province

Zip/Postal code

Phone number

Fax number

Make check payable to NCLCA.

Send completed application form and dues of $50.00 (U.S. funds) to:

NCLCA Membership Secretary
Peggy P. Mitchell, Director
Academic Advising & Student Success Center
Wilmington University
320 N. Dupont Hwy
New Castle, DE 19720
Office phone: 302.356.6810
E-mail: peg.p.mitchell@wilmu.edu
http://www.nclca.org

National
College
Learning
Center
Association

Michael Frizell
TLAR Journal Editor
Bear Claw Center for Learning & Writing
Missouri State University 901 South National Avenue
Meyer Library 112
Springfield, MO 65897