

**The Influence of a Summer Bridge Program on College Adjustment and Success:
The Importance of Early Intervention and Creating a Sense of Community**

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Abstract

This paper focuses on the factors influencing the academic success of students participating in a student support and retention initiative at a large, urban, public university: a “bridge” program. The summer bridge program is an intensive two-week program designed to introduce first-year students to collegiate-level expectations for writing, mathematics, communications, critical inquiry, campus resources, and study skills. The authors report how multiple methods were employed to assess how effective the summer bridge program has been in helping first-year students make successful transitions to college. Results suggest that the bridge participants had higher levels of academic performance (first-semester grade point averages) and levels of persistence (one-year and semester retention rates) compared to non-participants even while controlling for academic preparation variables and student background characteristics. Although first generation scholars reported that the program helped them adjust to college life, the findings were mixed in terms of scholar-bridge program participation and subsequent academic performance levels. The 2006 cohort of scholar-bridge participants did not attain significantly higher levels of academic performance compared the 2005 cohort of scholars who did not participate. The implications of developing effective early intervention support programs for at-risk college students are discussed.

The Influence of a Summer Bridge Program on College Adjustment and Success: The Importance of Early Intervention and Creating a Sense of Community

INTRODUCTION

Summer bridge programs have been designed to address the transitional educational needs of a wide range of first-year students. According to the literature on early intervention strategies, student support programs should be viewed as processes or intentional sets of programs designed to assist incoming students with their transitions to the institution. Additionally, content should be designed to meet the diverse needs of incoming students (e.g., Jacobs, 1993; Smith and Bracklin, 1993). Fox, Zakely, Morris, and Jundt (1993) contend that effective transitional programs should assist students in becoming academically and socially integrated into a new and unfamiliar university environment. These authors contend that well-designed support programs may serve as catalysts for improved retention of students from the freshman to the sophomore year.

Maples (2003) found that students who participated in a summer bridge program had higher academic achievement during the first semester than students who did not participate in a summer bridge program (even while controlling for background characteristics and academic preparation variables). Additionally, he found that students who participated in a summer bridge program had higher one-year retention rates and graduation rates compared to students who did not participate. A series of studies were conducted to assess the effectiveness of California State University's Summer Bridge program, a pre-enrollment course for under-prepared freshmen that focused on improving basic skills and familiarizing students with the university environment. Research findings suggested that the program has been successful in increasing first- and second-year retention rates for three student cohorts (Myers and Drevlow, 1982).

Many researchers emphasize the importance of institutions developing shared and agreed upon understandings and expectations of students' success levels (Hearn, 2006). According to Hearn, a number of on-campus factors predict students' academic success levels including establishing high expectations; coherence in the curriculum; integration of experiences, knowledge and skills; opportunities for active learning; assessment and frequent feedback; collaborative learning opportunities; time on task; respect for diversity; frequent contact with faculty; and the development of connections between classroom work and learning opportunities outside of the classroom (p. 1). It seems that summer bridge programs may be effective mechanisms for ensuring that students have the opportunity to develop high expectations; integrate experiences; establish connections with faculty, staff, and students; learn actively; and develop an appreciation for multiple levels of diversity. Additionally, many early intervention programs are based on Tinto's (1975) theoretical synthesis of research on dropouts from higher education and are designed to increase a student's integration and counterbalance initial disadvantages (e.g., Myers and Drevlow 1982).

Summer bridge programs may fall under the rubric of effective early interventions that are designed to facilitate a sense of community and help students adjust to college life as they are exposed to institutional expectations and protocols for attaining success. Some bridge program developers have asserted that the bridge programs are not remedial programs. Instead they have been designed to “address many issues that affect a student's decision to stay at college, to build a network of peer group support, and to make the campus a familiar place before the fall quarter begins” (Myers and Drevlow, 1982). Bridge programs often have the goal of building a sense of campus community and enhancing levels of social integration (e.g., Velasquez, 2002).

Many summer bridge programs have been designed to address the needs of the most at-risk at their institutions such as low income minority students (Myers and Drevlow, 1982), underrepresented

students of color at a predominantly white institution (Velasquez, 1992) and academically under-prepared students (Garcia, 1991). Another group of students that may benefit from early intensive interventions such as bridge programs are first-generation college students. Ishitani (2006) found that first-generation students are often exposed to higher risks of departure during their college years when compared to their counterparts. However, he found that having high levels of academic preparation may serve to help increase the odds of timely graduation among first-generation students. According to Kezar (1991), some of the barriers to success among first-generation students include the following factors: 1) lack of self-confidence; 2) inappropriate expectations or knowledge about college environment; 3) lack of connection to the college community or external community; 4) lack of early validation within the college environment; 5) family members who do not understand the goals of college; and, 6) not involving faculty in summer bridge programs and the transition process (Terenzini, Rendon, Upcraft, Millar, Allison, Gregg, Jalomo, 1996 as cited by Kezar).

Taken together, the literature suggests that investing resources into programs that help aid students' transitions to college by exposing them to collegiate-level expectations may help promote academic success. Additionally, bridge programs may be particularly beneficial for at-risk students as they help students successfully integrate both academically and socially. Studies examining retention and grade point average indicate that students in early support programs tend to perform better academically than students who did not receive the same type of support (Santa Rita & Bacote, 1996 as cited by Kezar). Limitations of the research on summer bridge programs include the lack of control groups and the inability to employ experimental designs (random assignment to interventions). Thus, extreme caution should be exerted when making inferences based on results. It seems that summer bridge programs may be effective programs for facilitating connections with faculty, staff, and other

students; learning about college-level expectations; developing academic skills; learning from peers; and adjusting to the demands of college.

Bickman (1987) states it is often critical to use program theory in conducting program evaluation studies. Understanding the program outcomes often requires understanding the underlying components and relationships upon which a program is based. Based on an examination of the summer bridge programs discussed in the literature, it seems that self-efficacy theory and social learning theory may be the “implicit theories” guiding many of the interventions. Self-efficacy refers to students’ evaluation of their competence to successfully execute academic tasks necessary to reach desired outcomes (Zajacova, Lynch and Espenshade, 2005). According to Bandura (1997), a strong sense of efficacy enhances human accomplishment and personal well-being in many ways. Individuals with high confidence in their capabilities approach difficult tasks as challenges to be mastered rather than threats to be avoided. Bandura suggests that persons’ self-efficacy beliefs can be developed from four major sources: mastery experiences, vicarious experiences provided by social models, social persuasion, and relying on somatic or emotional states. Zajacova, Lynch and Espenshade (2005) found that self-efficacy beliefs had a strong positive effect on grades and number of credit hours completed for freshmen immigrant, minority students.

Social learning theory posits that “human behavior can be learned observationally through modeling: from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action.” (Bandura, 1977, p. 22). Summer bridge programs may serve as a mechanism for enhancing self-efficacy beliefs among students by creating opportunities for them to perform and master tasks associated with academic success (e.g., forming study groups, developing effective study skills, interacting with faculty and peers, actively engaging in classroom discussions, etc.). Students also have the opportunity to learn from diverse peers. These

theories are drawn from in order to increase understanding of various outcomes reported in the current study.

CURRENT STUDY

Assessment scholars recommend that a variety of methodologies should be employed to facilitate understanding regarding “why” programs and interventions produce specific outcomes (e.g., Simpson 2002; Banta 2002; Siegel, 2003). This paper describes how multiple assessment methods were employed to comprehensively assess the impacts of a summer bridge program on academic performance and retention. Additionally, this study examined how students reacted to the program. This study was designed to ascertain post-perceptions of critical thinking, academic skills, study skills, knowledge of campus resources, college adjustment, awareness of college expectations, quality of instructional team/faculty interactions, social integration, sense of community, and contribution of class assignments and activities to learning.

Efforts were also made to increase understanding of what subgroups of students were benefiting the most from the interventions. The initial implementations of the summer bridge programs were aimed at meeting the needs of the most at-risk students attending our institution. However, in 2006 a change was made with regard to participating students. The majority of the seats were offered to first-generation scholars. Although being first-generation has been deemed a risk factor associated with low levels of attrition and degree completion (e.g., Ishitani, 2006), the first-generation students in the current study were “scholars” with relatively high levels of academic preparation. Several analyses were conducted using several cohorts (fall 2004, 2005, and 2006) to ascertain how this group of scholars benefited from the program (a homogeneous group) and how other participating students were impacted by this change. More specifically, investigations were conducted to determine if the academic performance of the most

at-risk (or conditionally admitted students) were affected by interacting with more prepared students during program participation. The following research questions guided this investigation:

- 1) Do summer bridge participants have higher levels of academic success (retention rates and first semester grade point averages) compared to non-participants even while controlling for pre-college academic preparation variables, background characteristics, and other program participation?
- 2) Do the most at-risk students (e.g., conditionally admitted students) benefit from the program and experience higher levels of academic success compared to non-participating at-risk students?
- 3) Do first-generation scholars (with high levels of academic preparation) benefit from participating in the summer bridge program? In other words, does adding a program component to gift aid increase their levels of academic success?
- 4) Do students react positively to the program in terms of self-reported learning outcomes in the following areas: critical thinking, academic skills, study skills, knowledge of campus resources, college adjustment, awareness of college expectations, quality of instructional team/faculty interactions, social integration, and sense of community?
- 5) What factors most significantly predict overall satisfaction with the program when considering the following self-reported program attributes and outcomes: critical thinking, academic skills, study skills, knowledge of campus resources, college adjustment, awareness of college expectations, quality of instructional team/faculty

interactions, social integration/sense of community, and program activities and assignments?

- 6) Were there differences in students' perceptions of the program and self-reported learning outcomes as a function of the year the students participated in the program?
- 7) Were there differences in students' perceptions of the program and self-reported learning outcomes as a function of type of bridge program offered (two-week compared to weekend)?

BRIDGE PROGRAM BACKGROUND

Widespread difficulties with academic success for many first year students at our institution necessitated a broad-based and multi-faceted approach. Many incoming students attending our university have characteristics that place them at a greater risk for academic failure such as not completing a rigorous high school college-preparatory curriculum, being first generation college students, living off campus, and having significant off-campus work commitments. As such, academic support programs such as bridge were intentionally designed to help facilitate academic success of at-risk students.

The summer bridge program is a two-week program for incoming freshmen held in August before fall classes begin. Participants in the program are introduced to collegiate-level expectations for writing, mathematics, communications, critical thinking, technology, library resources, and study skills. Students are divided into groups of 25 based on their interest in pursuing a particular major or in exploring various major options. Bridge participants are given opportunities to establish networks for success with faculty, advisors, student mentors and librarians; make friends with other freshmen; learn to handle college-level expectations for reading and writing; receive individualized support for math; begin connecting with a school and major; become acquainted with the campus; and gain experience in using instructional

technology. A signature characteristic of the bridge program at our institution is the instructional team model. Each bridge section is taught by an instructional team, which includes a faculty member, who is the team leader, an academic advisor, a librarian, and a student mentor.

The pilot bridge program was offered in the summer of 2001. Eighteen students participated. Invitations were limited to the most at-risk entering population. All of the first participants were conditionally admitted to the university because they did not meet the standards for admission. Traditionally, conditionally admitted students have not performed well academically compared to first-year students who are not conditionally admitted. However, of the eighteen students who participated in the first bridge program, half of them achieved a 3.00 or higher in their first collegiate semester and four students achieved a 3.5 or above. Due to the positive student reactions to the pilot summer bridge 2001 program, the program was implemented again in subsequent years and assessed comprehensively as the program grew in scope and number of participants.

Bridge participants continued to achieve statistically significant higher grade point averages in their first semesters compared to their peers. Additionally, based on end-of-course questionnaire results, they were highly satisfied with the program. Despite these positive findings, in 2005 the number of seats was expanded to 225 and enrollment fell short. In addition, too few first-generation and underrepresented students enrolled. Thus, a critical change in the design of the 2006 Bridge program was implemented by entering into a partnership with the Scholarship Office. For several years, the institution had offered scholarships to students who would be the first in their families to graduate from college. Although the First-Generation Scholarship award winners were fairly good students, the qualifying criteria were lower than for other campus scholarships (top 40% of their high school class and a 1000 SAT or 21 ACT score). Unfortunately, First-Generation Scholars had not been academically successful and they had one of the lowest achievement rates of all scholarship award winners. By partnering with the Scholarship Office, we

hoped to achieve several objectives: 1) increase the number of underrepresented and first generation participants in the bridge program, 2) ensure that available bridge seats were filled because the new partnership mandated participation in the bridge program for all First Generation Scholars, and 3) help improve the academic success rate of those scholarship award winners. Approximately 76% of the available seats for the 2006 bridge program were filled by First-Generation Scholarship winners.

There were two sections of the bridge program offered in 2006. The first (and original) section met for a two-week period Monday through Thursday from 8am to 4pm in mid-August before the start of fall classes. This section provided no campus housing or meals for its participants. Students commuted to campus every day and returned home in the evenings. This section will hence forth be referred to as “the Two-week Bridge”.

The second (and new) section was scheduled for the Thursday evening through Sunday afternoon sandwiched in between the two week program. The second section was an intensive residential experience where students stayed on campus together in Ball Residence Hall. They were each assigned a room with a roommate. The programming ran from 8am – 5pm daily with three meals provided. There was a break from 5pm to 6pm before dinner and then there was additional programming, usually from 7-10pm each evening. This section will hence forth be referred to as “the Weekend Bridge” (Barnett, 2006).

RESEARCH SETTING

The research took place at a large public, urban institution of higher education facing challenges in supporting retention and collegiate success of first-year students.

METHOD

Institutional Data Quantitative Analyses Design and Sample

The general design of the study was a single-institution quasi-experimental design with a control group. In an effort to understand the unique impacts of the program, matched control groups were used as reference points. In some cases, factors other than the program that were significant predictors of success (e.g., high school percentile ranks) served as covariates and were “controlled for statistically” when making comparisons between participants and non-participants. Data was collected during the 2004-2005, 2005-2006, and 2006-2007 academic years. Datasets that contained variables related to academic success levels (e.g., average first-semester grade point averages, fall-to-spring retention rates, one year retention rates, and the percentage of Ds, Fs, and Ws earned in courses) and program participation rates (e.g., Summer bridge, first-year seminars, learning communities) were assembled. Additional information on student background and enrollment characteristics was also collected (e.g., High school (H.S.) percentile ranks, SAT scores, Units of H.S math completed, gender, ethnicity, course load, first-generation status, first-generation scholar status, and campus housing). Only first-time students were included in the analyses. In 2004-2005, there were 2, 459 freshmen, in 2005-2006 there 2, 488 freshmen, and in 2006-2007 there were 2, 492 freshmen included in the analyses.

Questionnaire Design and Sample

The general design of this study was a non-experimental design: a post-program questionnaire with no control group. The questionnaire was designed to assess the following constructs: critical thinking, academic skills, study skills, knowledge of campus resources, college adjustment, awareness of college expectations, instructional team interactions, social integration/sense of community, and contribution of class assignments and activities to learning. Students participating in bridge courses were asked to voluntarily complete the anonymous questionnaires during class time at the end of semester. Students were asked to respond to Likert-type, 5-point scales ranging from 1 = “Strongly Disagree” to 5 = “Strongly Agree.” Example items included: “Participating in the Summer Academy improved my ability

to... Evaluate the quality of information, “Participating in the Summer Academy improved my ability to... Critically examine ideas and issues,” “Participating in the Summer Academy improved my ability to... Communicate my thoughts in writing,” and Participating in the Summer Academy improved my ability to... Adjust to college life.”

A total of 577 students completed the questionnaires during the years 2004, 2005, and 2006. The response rates were as follows: 2004 (97%), 2005 (97%), and 2006 (94%). Due to the fact that the questionnaires were anonymous and also used to provide meaningful feedback to instructional team members, there was no demographic information collected and the results could not be linked to any institutional data. Not having access to student identifiers limited the utility of the results to some degree because we were not able to identify what student self-reported learning outcomes contributed most substantially to academic performance levels. On the other hand, due to the anonymity of responses, students may have been more likely to respond to the questionnaires and provide candid responses to the items.

RESULTS

Institutional Data and Statistical Analyses

In an effort to understand program impacts a series of linear regressions, logistic regressions, and analyses of covariance were conducted. Independent samples t-tests and Chi-Square tests were conducted to determine if there were significant differences in academic success levels in cases where matched samples were created. Please note that results are reported in the formats below in an effort to increase understanding among most readers. In some cases a less conservative alpha level was adopted in order to increase the power levels of the statistical tests because the sample sizes were small (c.f., Lipsey, 1990).

Although there were significant differences in academic success levels among participants and non-participants in many cases, the results of linear regressions suggested that only about 2 to 3 percent of the variance in first semester grade point average was due to bridge participation once background characteristics and academic preparation variables were entered into the models.

2004 Cohort. A total of 172 students participated in the 2004 Summer Bridge. Conditionally admitted participants (30% of total participants) were retained at a higher level than conditionally admitted non-participants (63% and 52%, respectively) and had higher cumulative first semester grade point averages than conditionally admitted non-participants. Results also suggested that the bridge students performed significantly better academically compared to non-participants (while controlling for all significant background characteristics, academic preparation variables, and First-Year Seminar participation). Table 1 below displays the results. Although the results were in the positive direction, there was no statistically significant bridge effect on one-year retention (Table 2 below displays results).

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Table 1. Impact of Participation in 2004 Summer Bridge for All Students: Average First Semester Grade Point Average

Summer Bridge	N	Average Fall GPA	Adjusted Fall GPA
Participants	157	2.75	2.74
Non-Participants	1286	2.56	2.56
Overall	1443	2.58	

Note 1: Adjusted controlling for significant predictors of GPA in terms of demographics, enrollment, and academic preparation.

Note 2: Differences in GPA among participants and non-participants are significant ($p < .05$) (based on an analysis of covariance).

Note 3: The non-participant group includes students enrolled in First-Year Seminars, but did not participate in the Summer Bridge Program.

Table 2. Impact of Participation in 2004 Summer Bridge for All Students: One-Year Retention Rate

Summer Bridge	N	Retn Rate	Adjusted Retn Rate
Participants	163	72%	71%
Non-Participants	1460	67%	67%
Overall	1623	68%	

Note 1: Adjusted controlling for all significant predictors of retention (course load, H.S. Percentile Rank, and Units of H.S. Math).

Note 2: Logistic regression procedures were employed for all retention analyses. Results are displayed in the above format to enhance understanding for most audiences.

Note 3: Differences in retention rates among participants and non-participants are not significant.

2005 Cohort. A total of 175 students participated in the 2005 bridge program. Among the participants, 70% were women, 9% were African American, 53% were First-Generation College Students, 22% were admitted conditionally, and 18.17 was the average age. First-generation college students participating in the bridge (n=93) were retained at a significantly higher level than first-generation non-participants (n=1192) (74% and 61%, respectively) and had higher cumulative first semester grade point averages than first-generation non-participants (2.67 and 2.37, respectively).

Bridge students in general performed significantly better academically (fall semester cumulative grade point average) compared to non-participants (while controlling for all significant background characteristics, First-Year Seminar participation, and Themed Learning Community (TLC) participation). The bridge students had an adjusted fall grade point average of 2.67, compared to an adjusted fall grade point average of 2.47 for non-participants.

Results also suggest that the bridge students were retained at a significantly higher level compared to non-participants. The bridge students had an adjusted one-year retention rate of 73%, compared to an adjusted one-year retention rate of 65% for non-participants. Displayed in Tables 3 and 4 are the results for the 2005 bridge cohort.

**Table 3. Impact of Participation in 2005 Bridge for All Students:
Average First Semester Grade Point Average**

Summer Bridge	N	Average Fall GPA	Adjusted Fall GPA
Participants	153	2.87	2.67
Non-Participants	1318	2.45	2.47
Overall	1471	2.49	

Note 1: Adjusted controlling for significant predictors of GPA in terms of demographics, enrollment, and academic preparation, TLC participation, and Seminar participation.

Note 2: Differences in GPA among participants and non-participants are significant ($p < .05$) (based on an analysis of covariance).

Note 3: The non-participant group includes students enrolled in First-Year Seminars, but did not participate in Bridge.

Table 4. Impact of Participation in 2005 Summer Bridge for All Students: One-Year Retention

Summer Bridge	N	Retn Rate	Adjusted Retn Rate
Participants	159	78%	73%
Non-Participants	1416	64%	65%
Overall	1575	66%	

Note 1: Adjusted controlling for all significant predictors of retention (course load, H.S. Percentile Rank, Units of H.S. Math, Seminar participation, and TLC participation).

Note 2: Logistic regression procedures were employed for all retention analyses. Results are displayed in the above format to enhance understanding for most audiences.

Note 3: Differences in retention rates among participants and non-participants are significant ($p < .05$).

It is noteworthy that 38 (22%) of the bridge participants were admitted conditionally. Conditionally admitted participants were retained at a higher level than conditionally admitted non-participants (77% and 56%, respectively) and had higher cumulative first semester grade point averages than conditionally admitted non-participants (2.52 and 2.06, respectively). Please note that statistical controls were employed. The differences were statistically significant despite the small sample sizes. Results are shown Tables 5 and 6.

Table 5. Impact of Participation in 2005 Summer Bridge: Average First Semester Grade Point Average

	Summer Bridge	N	Average Adjusted Fall GPA
<i>Regular Admits</i>	Participants	120	2.77
	Non-Participants	858	2.68
	Overall	978 (2.69)	

<i>Conditional Admits</i>	Participants	33	2.52
	Non-Participants	460	2.06
Overall		493 (2.09)	

Note 1: Adjusted controlling for significant predictors of fall grade point average: course load, H.S. Percentile Rank, SAT score, Units of H.S. Math, age, gender, ethnicity, seminar participation, and TLC participation.

Note 2: Differences in GPA among participants and non-participants are significant for Conditional Admits ($p < .05$). (based on analysis of covariance)

Table 6. Impact of Participation in 2005 Summer Bridge: One-Year Retention

	Summer Bridge	N	Average Adjusted Retention
<i>Regular Admits</i>	Participants	127	74%
	Non-Participants	936	70%
Overall		1263 (70%)	
<i>Conditional Admits</i>	Participants	32	77%
	Non-Participants	480	56%
Overall		612 (57%)	

Note 1: Adjusted controlling for significant predictors of one-year retention: course load, H.S. Percentile Rank, SAT score, Units of H.S. Math, TLC participation, and seminar participation.

Note 2: Logistic regression procedures were employed for all retention analyses. Results are displayed in the above format to enhance understanding for most audiences.

Note 3: Differences in one-year retention rates among participants and non-participants are significant for Conditional Admits ($p < .05$).

2006 Cohort: Introduction of First-Generation Scholars. A total of 209 students participated in the two-week summer bridge program offered in 2006. The cohort had the following characteristics: 71% were women, 8% were African American students, 89% were first-generation college students, 70% were First-Generation Scholars, only 7% were admitted conditionally, the Average SAT Score was 1000, the average high school percentile rank was 75%, 27% lived in campus housing, and the average age was 18.75.

A total of 47 students participated in the weekend bridge program offered in 2006. The cohort had the following characteristics: 77% were women, 4% were African American students, 98% were first-generation college students, 98% were First-Generation Scholars, only 1 student was admitted conditionally, the Average SAT Score was 978, the average high school percentile rank was 76%, 51% lived in campus housing, and the average age was 18.75.

In order to understand the effect of the summer bridge program on the academic success levels of First-Generation Scholars, a matched control group was created by examining the 2005 group of first-generation who did not participate in the summer bridge program (the 2006 group were mandated to participate; 50 students were waived from mandatory participation for various reasons). There were no differences in academic success levels between participants and non-participants. Results are displayed in Table 7.

Table 7. Comparison of Fall 2005 First-Generation Scholars and Fall 2006 First-Generation Scholars

First-Generation Scholar	N	Avg. Fall GPA	% below a 2.0 GPA	DFW Rate	Fall to Spring Retention Rate	Fall to Fall (One-Year) Retention Rate	Avg. H.S. GPA	Avg. H.S. Pctile Rank ^a	Avg. SAT Score ^a
Fall 2005 (no Bridge)	114	2.77	19%	16.16%	94%	81%	3.12	76	1025
Fall 2006 (Bridge)	193	2.78	15%	15.79%	94%	n/a	3.21	76	985

First-Generation Scholar	% Female	% Afrn Amer	Average Age	Units of HS Math	Avg. Course Load	% Seminar Participants	% Campus Housing
Fall 2005 (no Bridge)	70%	9%	18.21	8.04	13.76	82%	32%
Fall 2006 (Bridge)	77%	9%	18.72	8.36	13.76	97%	34%

^a excludes missing data.

Note 1: Bolded items are significantly different based either on a Chi-Square Test or an Independent Samples T-test ($p < .10$). A less conservative alpha level selected due to relatively small sample sizes and concerns about power levels of t-tests.

Note 2: Pattern of results remained the same when conducting an examination "controlling for" First-Year Seminar Participation. The academic success of students could be attributed to seminar participation and not bridge. A comparison was conducted by selecting seminar participants only for both groups.

First-Generation Scholars who participated in either the 2006 two-week bridge or the weekend bridge were retained at a significantly higher (fall-to-spring retention rate) compared to First-Generation Scholars who did not participate in any form of a bridge intervention. There were no differences in terms of academic performance. Results are shown in table 8.

Table 8. Comparison of Fall 2006 First-Generation Scholars Bridge (Weekend or Two-Week Program) and No Bridge

First-Generation Scholar	N	Avg. Fall GPA	% below a 2.0 GPA	DFW Rate	Fall to Spring Retention Rate	Fall to Fall (One-Year) Retention Rate	Avg. H.S. GPA	Avg. H.S. Pctile Rank ^a	Avg. SAT Score ^a
Fall 2006 (no Bridge)	50	2.66	20%	23.18%	84%	n/a	3.16	76	987
Fall 2006 (Bridge)	193	2.78	15%	15.79%	94%	n/a	3.21	76	985

First-Generation Scholar	% Female	% Afrn Amer	Average Age	Units of HS Math	Avg. Course Load	% Seminar Participants	% Campus Housing	% TLC Participants
Fall 2006 (no Bridge)	72%	8%	18.65	8.31	13.8	86%	32%	14%
Fall 2006 (Bridge)	77%	9%	18.72	8.36	13.76	97%	34%	38%

^a excludes missing data.

Note: Bolded items are significantly different based either on a Chi-Square Test or an Independent Samples t-test ($p < .10$).

First-Generation Scholars who participated in the 2006 two-week bridge were retained at a significantly higher (fall-to-spring retention rate) compared to First-Generation Scholars who did not participate in any form of a bridge intervention. There were no differences in academic performance levels between weekend bridge participants, two-week participants, and those students who did not participate in any bridge program. However, the scholars who participated in the two-week bridge intervention had significantly higher fall-to-spring retention rates compared to scholars who did not participate in a bridge intervention. Results are shown in table 9.

Table 9. Comparison of Fall 2006 First-Generation Scholars Two-Week Bridge, Weekend Bridge, and No Bridge

First-Generation Scholar	N	Avg. Fall GPA	% below a 2.0 GPA	DFW Rate	Fall to Spring Retention Rate	Fall to Fall (One-Year) Retention Rate	Avg. H.S. GPA	Avg. H.S. Pctile Rank ^a	Avg. SAT Score ^a
Two-Week Bridge	147	2.78	14%	14.62%	96%	n/a	3.23	76	986
Weekend Bridge	46	2.78	15%	19.53%	89%	n/a	3.16	76	980
No Bridge	50	2.66	20%	23.18%	84%	n/a	3.16	77	987

First-Generation Scholar	% Female	% Afrn Amer	Average Age	Units of HS Math	Avg. Course Load	% Seminar Participants	% Campus Housing
Two-Week Bridge	76%	10%	18.75	8.44	13.72	99%	29%
Weekend Bridge	78%	4%	18.63	8.09	13.87	91%	50%
No Bridge	72%	8%	18.65	8.31	13.80	86%	32%

^aexcludes missing data.

Note: Bolded items are significantly different based either on a Chi-Square Test or an Independent Samples T-test (p<.10).

Non-first-generation scholars who participated in the summer bridge program seemed to perform academically worse compared to non-participants. Shown in table 11 is a comparison with a matched sample. Students were selected based on major selection, first-generation status, housing, and academic preparation. Results suggest that students in the bridge program did not perform significantly better. However, if the bridge participation was paired with participation in a themed learning community, the bridge participants had higher levels of academic success (higher first-semester grade point averages, lower

“DFW” rates, and higher fall-to-spring retention rates). Additionally conditional admitted students who participated in the 2006 implementation of the summer bridge program did not perform better academically than conditionally admitted non-participants. In fact, the conditionally admitted students who participated in the 2006 bridge program (there were only 15 of them and thus, they became a minority group in terms of proportion participating) had dismal levels of academic success. A total of 53% earned grade point averages below a 2.0 during the first semester (meeting the criteria for academic probation). Tables 10-14 display the results.

Table 10. Impact of Participation in a The Summer Bridge Program for Non Scholars: Average First Semester Grade Point Average

	N	Average Fall GPA	Adjusted Fall GPA
No Bridge	1268	2.58	2.58
Bridge	55	2.43	2.36
Overall	1323	2.57	

Note: Adjusted controlling for significant predictors of fall grade point averages: H.S. Percentile Rank, SAT score, Units of H.S. Math, age, gender, ethnicity, First-Generation status, and First-Year Seminar participation. (based on analyses of covariance)

Differences in GPA among participants and non-participants are marginally significant ($p < .10$).

Table 11. Comparison of Fall 2006 Non-First-Generation Scholars Bridge Participants (Matched Sample)

	N	Avg. Fall GPA	% below a 2.0 GPA	DFW Rate	Fall to Spring Retention Rate	Fall to Fall (One-Year) Retn Rate	Avg. H.S. GPA	Avg. H.S. Pctile Rank ^a	Avg. SAT Score ^a
Fall 2006 (no Bridge)	83	2.71	20%	18.64%	88%	n/a	3.23	70	1029
Fall 2006 (Bridge)	62	2.52	24%	22.56%	81%	n/a	3.19	71	1028

	% Female	% Afrn Amer	Average Age	Units of HS Math	Avg. Course Load	% Seminar Participants	% Campus Housing	% First-generation	% Conditional admit
Fall 2006 (no Bridge)	60%	5%	18.75	8.02	13.9	100%	29%	64%	24%
Fall 2006 (Bridge)	60%	5%	18.75	8.11	13.98	100%	24%	68%	24%

^a excludes missing data.

Note 1: Bolded items are significantly different based either on a Chi-Square Test or an Independent Samples T-test ($p < .10$). A less conservative alpha level selected due to relatively small sample sizes and concerns about power levels of t-tests.

Table 12. Comparison of Fall 2006 Non-First-Generation Scholars Bridge and Bridge-Themed Learning Community

	N	Avg. Fall GPA	% below a 2.0 GPA	DFW Rate	Fall to Spring Retention Rate	Fall to Fall (One-Year) Retention Rate	Avg. H.S. GPA	Avg. H.S. Pctile Rank ^a	Avg. SAT Score ^a
Fall 2006 (Bridge and TLC)	39	2.71	21%	15.97%	87%	n/a	3.16	72	1036
Fall 2006 (Bridge Only)	23	2.21	30%	33.72%	70%	n/a	3.22	70	1017

First-Generation Scholar	% Female	% Afrn Amer	Average Age	Units of HS Math	Avg. Course Load	% Seminar Participants	% Campus Housing
Fall 2006 (Bridge and TLC)	64%	5%	18.72	8.03	13.82	100%	23%
Fall 2006 (Bridge Only)	52%	5%	18.80	8.26	14.26	100%	26%

^a excludes missing data.

Note: Bolded items are significantly different based either on a Chi-Square Test or an Independent Samples t-test ($p < .10$).

Table 13. Impact of Participation in Summer Bridge Non-Scholars: Average First Semester Grade Point Average

	Bridge	N	Average Fall GPA	Adjusted Fall GPA
<i>Regular Admits</i>	Non-Participants	842	2.81	2.81
	Participants	40	2.74	2.72
	Overall	882	2.81	
<i>Conditional Admits</i>	Non-Participants	426	2.12	2.13
	Participants	15	1.59	1.55
	Overall	441	1.98	

Note 1: Adjusted controlling for significant predictors of fall grade point average: course load, H.S. Percentile Rank, SAT score, Units of H.S. Math, age, gender, ethnicity, campus housing, and first-generation status.

Note 2: Differences in GPA among participants and non-participants are significant for Conditional Admits ($p < .05$). (based on analysis of covariance)

Table 14. Comparison of Fall 2006 and Fall 2005 Conditionally Admitted Bridge Participants

	N	Avg. Fall GPA	% below a 2.0 GPA	DFW Rate	Fall to Spring Retention Rate	Fall to Fall (One-Year) Retention Rate	Avg. H.S. GPA	Avg. H.S. Pctile Rank ^a	Avg. SAT Score ^a
Bridge 2005 Conditional Admit	38	2.51	26%	19.42%	97%	n/a	3.15	52	923
Bridge 2006 Conditional Admit	15	1.59	53%	47.50%	67%	n/a	3.15	61	885

	% Female	% Afrn Amer	Average Age	Units of HS Math	Avg. Course Load	% Seminar Participants	% Campus Housing	% First-Generation	% TLC Participant
Bridge 2005 Conditional Admit	53%	13%	18.11	7.02	13.37	100%	26%	59%	55%
Bridge 2006 Conditional Admit	60%	13%	18.70	7.26	13.47	100%	27%	73%	53%

^aexcludes missing data.

Note 1: Bolded items are significantly different based either on a Chi-Square Test or an Independent Samples T-test ($p < .10$). A less conservative alpha level selected due to relatively small sample sizes and concerns about power levels of t-tests.

End-of-Course Questionnaires

Principal Components Analyses: Nine Constructs Emerge. A Principal Components Analysis

with Varimax rotation was conducted on the questionnaires in order to understand the 45 items designed to assess the students' perceptions and experiences during program participation. After suppressing factor loadings of less than 0.30, nine factors emerged (see Table 15 for factors and factor loadings). Please note that "factors" were formed based on a combination of factor loadings, scale reliabilities, and theoretical framework guiding initial item formation. All scales had acceptable levels of internal reliability, with the subscale having a Cronbach's alpha levels ranging from .831 to .684. Although some of the "scales" contain relatively few items, this method of combining items was preferred over using single items when employing inferential statistical procedures such as regressions and analysis of variance procedures with post-hoc comparisons.

Table 15. End-of-Course Summer Bridge Questionnaire Factors with Item Factor Loadings

Factor 1: Critical Thinking	Factor Loading
Use class discussions to help my learning	.611
Think critically about what I read	.681
See multiple sides of issues	.674
Evaluate the quality of information	.675
Critically examine ideas and issues	.706
scale $\alpha = .875$	
Factor 2: Academic Skills	Factor Loading
Communicate my thoughts in writing	.532
Communicate my thoughts in speaking	.638
Give oral presentations	.773
Do research projects effectively	.680
Do well in math courses	.398
scale $\alpha = .803$	
Factor 3: Study Skills	Factor Loading
Set priorities so I can accomplish what is most important to me	.693
Manage my time to meet my responsibilities	.767
Establish an effective study schedule	.724
Prepare for tests and exams	.588
scale $\alpha = .867$	
Factor 4: Knowledge of Campus Resources	Factor Loading
Find my way around campus	.676
Locate the appropriate campus resources when I need help	.690
Use IUPUI technology such as Oncourse	.602
Find what I need at the library	.415
Campus resources available to help me (e.g., Writing Center, Math Assistance Center, Learning Center, Career Center).	.521
scale $\alpha = .684$	

Table 14. End-of-Course Summer Bridge Questionnaire Factors with Item Factor Loadings

Factor 5: College Adjustment	Factor Loading
Manage and cope with stress	.366
Decide on a major or future career	..579
Succeed academically	.555
Adjust to college life	.417
Feel connected to IUPUI	.460
Feel able to meet the demands and expectations of college	.660
Feel confident that I can handle the challenges of college	.680
scale $\alpha = .850$	
Factor 6: Awareness of College Expectations	Factor Loading
Faculty expectations of students	.335
IUPUI's Principles of Undergraduate Learning (PULs)	.397
Student Organizations on campus	.566
My learning style(s)	.651
Why I am attending college	.658
My career aspirations	.503
The importance of having realistic expectations of college	.479
scale $\alpha = .844$	
Factor 7: Instructional Team/Faculty Interactions	Factor Loading
Established a meaningful relationship with a faculty member	.629
Established a meaningful relationship with an academic advisor	.793
Beneficial interactions with a student peer mentor	.373
Beneficial interactions with an academic advisor	.667
Beneficial interactions with a faculty member	.515
Beneficial interactions with a librarian	.346
scale $\alpha = .847$	
Factor 8: Social Integration/Sense of Community	Factor Loading
Developed an appreciation of social and cultural diversity	.346
Established close friendships	.688
Met new people	.719
scale $\alpha = .844$	
Factor 9: Class Assignments and Activities	Factor Loading
Meaningful class discussions	.688
Meaningful activities	.737
Meaningful assignments	.749
scale $\alpha = .838$	

Understanding the Bridge Participants' Self-Reported Learning Outcomes. In an effort to enhance understanding of what components of the bridge program had the most positive impacts on students' self-reported learning outcomes, the mean ratings on all constructs were rank ordered. Results suggest that students perceived that the program was making the most substantive contributions to their learning about campus resources, providing opportunities for developing a sense of community and establishing friendships with other students (social integration), and helping them make successful transitions and adjust to the demands and expectations of college. Table 16 displays the results.

Table 16. Questionnaire Constructs Rank Ordered by Mean Rating

	N	Mean	Std. Deviation
Campus Resources	521	4.41	.45
Social Integration/Sense of Community	519	4.35	.57
College Adjustment	512	4.17	.55
Interactions with Instructional Team	526	4.15	.59
Class Activities	525	4.10	.70
College Expectations	499	4.09	.59
Critical Thinking	520	3.96	.66
Study Skills	515	3.95	.66
Academic Skills	523	3.85	.66

Note: Bolded items are statically significant compared to 2006 based on ANOVA analyses with post-hoc comparisons ($p < .05$). Based on a 5-point Likert-type scales.

Students' Perceptions of College Adjustment, Positive Interactions with Faculty, and Contributions of Course Activities and Assignments to Learning Made the Most Substantial Contributions to Overall Bridge Satisfaction. A multiple regression was conducted in order to ascertain what aspects of the bridge experience made the most substantial contributions to students' overall level of program satisfaction. Students were asked to rate their level of agreement to the following question on a 5 point Likert-type

scale: “Overall, how satisfied were you that the Summer Bridge provided you with the resources and information to help you succeed in college?” As expected, results indicated that these factors strongly predicted overall satisfaction with the bridge experience: Critical Thinking, Academic Skills, Study Skills, Knowledge of Campus Resources, College Adjustment, Awareness of College Expectations, Instructional Team Interactions, Social Integration/Sense of Community, and Class Assignments and Activities (adjusted $R^2 = .028$, $F(9, 421) = 18.86$, $p < .0001$). Shown in Table 17 are the relative contributions of each “Factor” (treated as variables) in the analysis. Results suggested that College Adjustment, Course Activities and Assignments, and Interactions with Instructional Team Members made the most impact on students’ overall satisfaction levels with the bridge experience.

Table 17. Multiple Regression: Bridge Learning Outcomes and Overall Program Satisfaction

<u>Criterion Variables</u>	<u>Std. Beta Weight</u>	<u>t</u>	<u>df</u>	<u>prob.</u>
Factor 1: Critical Thinking	.012	.180	430	.857
Factor 2: Academic Skills	.000	.003	430	.997
Factor 3: Study Skills	.032	.506	430	.613
Factor 4: Campus Resources	.083	1.538	430	.125
Factor 5: College Adjustment	.230	3.283	430	.001
Factor 6: College Expectations	-.061	-.873	430	.383
Factor 7: Faculty Interactions	.140	2.257	430	.025
Factor 8: Social Integration	.025	.441	430	.660
Factor 9: Class Activities	.188	3.240	430	.001

Comparisons by Year and Bridge Type. A series of ANOVAs with post hoc comparisons were conducted to determine if there were mean differences in students’ perceptions of their bridge experiences based on cohort year. Shown in table 18 are the results. Results suggest that students participating in the 2006 bridge experience were significantly more satisfied in several areas compared to students in the 2004 and 2005 cohorts.

Table 18. Questionnaire Constructs: Mean Comparisons by Bridge Cohort Year

	2004 (167)	2005 (170)	2006 (197)
Critical Thinking	3.82	3.82	4.21
Academic Skills	3.66	3.79	4.06
Study Skills	3.80	3.84	4.17
Knowledge of Campus Resources	4.25	4.41	4.52
College Adjustment	4.05	4.11	4.30
Awareness of College Expectations	3.97	4.03	4.25
Instructional Team Interactions	3.99	4.11	4.32
Social Integration/Sense of Community	4.33	4.25	4.44
Class Assignments and Activities	3.97	3.94	4.34

Note: Bolded items are statically significant compared to 2006 based on ANOVA analyses with post-hoc comparisons ($p < .05$).

A series of t-tests were also conducted to determine if there were significant differences between 2006 students who participated in the two-week bridge experience compared to students who participated in the weekend experience. Results are shown in table 19. It appears that students who participated in the two-week program had greater self-reported learning outcomes in the area related to knowledge of campus resources compared to the weekend program participants ($t(225)=2.82, p < .05$). The two-week participants were also significantly more satisfied with their interactions with instructional team members compared to the weekend program participants ($t(217)=2.60, p < .05$).

Table 19. Questionnaire Constructs: Mean Comparisons by Bridge Intervention Type

	Bridge Type	N	Mean	Std. Deviation
Critical Thinking	Weekend	38	4.18	.67
	Two-Week Bridge	195	4.21	.59
Academic Skills	Weekend	36	3.98	.74
	Two-Week Bridge	192	4.06	.62
Study Skills	Weekend	41	4.29	.58
	Two-Week Bridge	190	4.17	.65
Campus Resources	Weekend	31	4.28	.56
	Two-Week Bridge	196	4.52	.42
Adjustment	Weekend	39	4.43	.54
	Two-Week Bridge	195	4.30	.51
Expectations	Weekend	40	4.23	.62
	Two-Week Bridge	186	4.25	.58
Interactions	Weekend	24	3.99	.75
	Two-Week Bridge	195	4.32	.56
Social	Weekend	43	4.50	.52
Integration/Sense of Community	Two-Week Bridge	193	4.44	.54
Class Activities and Assignments	Weekend	43	4.29	.60
	Two-Week Bridge	196	4.34	.68

Note: Bolded items are statically significant compared based on independent samples t-test ($p < .05$).

LIMITATIONS

When interpreting the results of all reported investigations, one must be aware of several limitations. It is critical to note that causal relationships can't be inferred given the methodology employed in this research (e.g., survey research and correlational designs). Thus, caution should be taken when interpreting the results reported throughout this paper. One of the most serious problems with this research stems from the fact that the relationships between students' learning outcomes, perceptions of course benefits, and overall satisfaction with the bridge program were examined using self-report data collected at one point in time in some cases. Thus, true causality cannot be determined. Further, common method variance may have contributed to the results. The ability to link objective (e.g., actual academic performance) and perceptual measures of bridge program outcomes was not possible given the lack of student identifiers on the *anonymous* questionnaires. Additionally, self-selection bias may also operating at some level and may

be responsible for the some of the positive program impacts reported in this paper. It is possible that that the most motivated students with proclivities toward attaining academic success could have volunteered to participate.

DISCUSSION

Results of this study suggest that student participation in the summer bridge program does positively impact academic performance and success levels of participants. Additionally, questionnaire findings indicate that students seem to have positive reactions to the program. Questionnaire results indicated that the summer bridge program is perceived as particularly helpful in the following areas: getting acclimated to campus surroundings and resources, helping students adjust to college life, understanding college and faculty expectations, and establishing friendships with other students. Additionally results indicated that students' perceptions of improvement in the area of college adjustment, positive interactions with instructional team members, and feelings that course activities and assignments contributed to learning made the most substantial contributions to levels of overall bridge satisfaction. However, the questionnaire results do not seem to explicate why the bridge 2006 group of non-scholars did not do well academically compared to "peers" in previous programs. Questionnaire responses indicated that students responded more positively to the program in 2006 compared to 2004 and 2005. It is possible that students' levels of program satisfaction do not translate into succeeding academically!

Considerable efforts were implemented in 2006 to help another at risk group via the summer bridge intervention: First-Generation Scholars. However, the findings were mixed. The 2006 scholars who participated did not perform better academically compared to the group of 2005 scholars who did not participate in the bridge programs. However, the 2006 group who did participate in the program had significantly higher levels of academic performance (e.g., lower number of earned Ds, Ws, Fs in courses) compared to the scholars who did not participate in any bridge intervention.

Non-first-generation scholars who participated in the summer bridge program seemed to perform academically worse compared to non-participants. However, if the bridge participation was paired with participation in a themed learning community, the bridge participants had higher levels of academic success (higher first-semester grade point averages, lower “DFW” rates, and higher fall-to-spring retention rates). Findings imply that the combination of a themed learning community experience and a summer bridge intervention may be especially beneficial for first-year students. Themed learning communities are expanded learning communities that link three or more first-year courses together and offer a structured first-semester learning environment where students can easily develop a strong sense of community and see connections across disciplines. This finding is consistent with previous research on learning community participation. In a multiple institutional study, Zhao and Kuh (2004) found that participation in learning communities was positively associated with a variety of educational outcomes such as academic performance, academic effort, academic integration, faculty-student interactions, engagement in diversity-related interactions, enrollment in classes that emphasize higher-order thinking skills, and satisfaction with college experiences.

Although early implementations suggested the program was particularly beneficial for conditionally admitted students---those deemed most academically under-prepared for college, the program implementation was modified in 2006 to accommodate a large group of First-Generation Scholars who were not conditionally admitted. Results suggest that the most at-risk students did not do well in the 2006 bridge environment. Additionally, conditionally admitted students who participated in the 2006 implementation of the summer bridge program did not perform better academically than conditionally admitted non-participants. In fact, the conditionally admitted students who participated in the 2006 bridge program (there were only 15 of them and thus, they became a minority group in terms of proportion participating) had dismal levels of academic success. A total of 53% earned grade point averages below a

2.0 during the first semester (meeting the criteria for academic probation). It is plausible that providing opportunities for the most at-risk students to interact with diverse and very academically prepared peers would result in high levels of academic success. Taken to another theoretical level, one would hope that the most at-risk students would model the social and academic behaviors of more prepared students and this modeling would translate into high levels of academic success. However, results of this study suggest that the most at-risk student did not seem to benefit from the interactions with more academically prepared peers.

While self-efficacy theory suggests that self-efficacy beliefs can be enhanced as individuals seek competent models possessing the abilities to which they aspire, it is possible that the conditionally admitted students did not view the scholars as a viable peer group. In other words, the scholars may have been perceived as being so different that the under-prepared students did not view them as comparable peers. It is possible that observing the skill levels and academic success of more prepared students may have had negative impacts on the self-efficacy levels of the most at-risk students. In other words, the conditionally admitted students may have felt that they were not capable of executing the behaviors necessary to achieve high levels of academic success. More investigation is necessary to explicate the impacts of social interactions among at-risk students and “scholars.” This study did not directly study these variables. Ideally, future investigations will explicate how bridge programs can successfully help the most at-risk college students adjust to college and attain academic success.

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