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Invited article: Bridging the gap – supporting the transition from high school to college

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Abstract

Idaho State University's Bengal Bridge is a summer program designed to help students successfully transition from high school to their first year of college at Idaho State University. All Bridge students at ISU take two general education courses, plus an additional credit of supplemental instruction focused on academic strategies specific to the disciplines represented by those general education courses, as well as a First Year Transition (ACAD) course to facilitate engagement with and acculturation to the university community—a total of nine to 10 credits in just seven weeks. Bridge students are also supported by one-to-one academic coaching, supplemental tutoring, peer mentors, and additional study labs.

What began as a summer "jumpstart" for a closely-monitored and tight-knit cohort of students in a specific demographic is now becoming the academic equivalent of "boot camp" for a larger, diverse population more representative of the typical fall semester student demographics in terms of the range of academic performance, financial resources, etc. Because this expanded Bengal Bridge is in an early stage of development and still evolving, we realized that we needed a more comprehensive understanding of the Bridge population if we are to accurately assess Bridge's impact on FY student retention. To begin this process, we began collecting descriptive statistics and completing various surface level analyses. Ideally, the data will allow us to better serve future students, improve allocation of resources, and conclude whether participation in Bengal Bridge, in its present iteration, increases retention to the fall semester and beyond.

Keywords: Bridge programs, first-year student retention, academic coaching, first-year transition, persistence to degree completion

In the spring of 2015, the Idaho State University Student Success Center received appropriated, continuing funding from the state (Complete College Idaho funding) to expand their summer Bengal Bridge program and develop a first-year transition program to help first-year [FY] students persist at greater rates. The First Year Transition [FYT] team, comprised of a Director and eight faculty functioning in a hybrid role as both instructors and academic coaches, was formed and began work in August of 2015.

The fundamental objective of the FYT program is to provide continuous and proactive contacts with all FY students to preemptively identify impediments to retention and help students persist from their first to second years at greater rates. From its inception, the intent was to form a team that would be able to bring expertise in various disciplines to FY student advising. Currently, the FYT team includes two doctoral degrees and five Master's representing STEM disciplines, social sciences, and humanities. FYT faculty hold full-time, 12-month positions. This year-round presence enables them to teach academic success courses in fall, spring, and summer, as well as general education courses in their areas of expertise for the summer Bengal Bridge program. Their teaching load constitutes 15+ teaching credits per year or roughly half of their workload. The other half of their job is to provide academic coaching in multiple venues for FY students throughout the year.

The academic coaching model adopted by the FYT unit is intrusive, proactive, and holistic. In an intrusive model, academic coaches do not wait for students to experience a problem and seek help; instead, the FYT coaches preemptively identify potential impediments to success and retention and then reach out to students. While underprepared students benefit greatly from sustained academic coaching, the program does not limit its outreach to students who demonstrate obvious need. *Every* FY student at ISU is assigned to an academic coach, whose job is to identify the specific needs of each student in his or her cohort and, in one-to-one, individualized coaching appointments, foster student self-efficacy by helping students assess their progress, determine short and long-range goals, and develop the skills and connections to resources that lead to success.

While the FYT unit utilizes mass communication methods for initial contacts, the goal is face-to-face visits that cultivate relationships between the coaches and the students. A typical academic coaching appointment may include helping a student complete a FAFSA, register for a semester, declare a major, brainstorm strategies for improving a course grade, or arrange a consultation with a professor. Academic coaches may also help students by connecting them to resources for emergency funding, counseling and testing, and disability services, as well as Career Path Internships, campus jobs, peer mentoring opportunities, and more. The intent is for the coaches to know each FY student's aspirations and needs sufficiently to be able to facilitate those connections that increase retention.

Idaho State University's first-year student population is largely first-generation. With this and a go-on rate for the state well below the targeted 60% (Idaho State Board of Education), part of the challenge confronting the First Year Transition team is figuring out how to help students lacking a strong culture of matriculation to higher education not just to *attempt* college, but to venture *successfully*. Though this is the objective of the FYT program, in general, it is the special focus of a summer component of FYT: the Bengal Bridge program.

Bengal Bridge

Bengal Bridge is a seven-week summer program designed to help students successfully transition from high school to their first year of college at Idaho State University. Bengal Bridge began as a TRiO program in 2013, with a small cohort of 31 students. Under TRiO, students were eligible for Bridge if they were low-income and first-generation. The first courses offered were non-credit-bearing remedial Math and English, but by the third year, a few general education courses were being added to the course offerings. The

successful persistence of Bridge students to the fall semester resulted in the allocation of CCI funding for the formation of the FYT unit, one of its purposes being the expansion of Bridge so that more Idaho students would have access to this level of support in matriculating to higher education.

In 2016, Bridge became an FYT program, and the criteria for acceptance was expanded to include factors besides low-income and first-generation that might inhibit a student from attempting or persisting in college: low test scores, low GPA, disability, underrepresented minority, English as a second language, lack of familial support for education, etc. A student applying to Bridge need meet only *one* criterion to qualify, and each case is assessed individually by the FYT Bridge coordinator under the supervision of the FYT Director. It is important to note the breadth of the qualification criteria: some ISU Bridge students also qualify for the Honors program based on their high school academic performance and test scores, but lack adequate resources to attend college; others have sufficient financial or familial support, but lack academic preparedness. The broader scope of the Bridge acceptance criteria is an acknowledgement of the multiple factors that influence the Idaho go-on rate and retention to degree completion.

Under FYT, Bridge has been growing, primarily due to expanded resources (namely, the FYT personnel) and the broadened definition of eligibility for entry into the program. Bridge registrations have increased every summer, reaching over 100 students in 2016 and 167 students in 2017.

Generally, the objective of a summer bridge program is to teach the skills and provide the additional support necessary for high school seniors to transition smoothly into their first semester at a university. This is achieved during Bengal Bridge by providing students with extra support through academic coaching, tutoring, supplemental instruction, and supported study sessions. Bridge instructors also receive additional training on student-success-focused instruction practices, and Bridge instructors that are not FYT faculty are closely supported by the FYT academic coaching practices.

All Bridge students at ISU take two general education courses, plus an additional credit of supplemental instruction focused on academic strategies specific to the disciplines represented by those general education courses. Bridge students also take a First Year Transition (ACAD 1102 or ACAD 1104) course that fosters student self-efficacy and connection to the university community. This equates to nine or ten college credits earned in an intensive seven weeks. Bengal Bridge classes, which include options like Biology, Anthropology, Communication (Speech), Political Science, University Inquiry (Information Literacy), as well as Math and English, are reserved for Bridge students, who are grouped into cohorts and attend classes and supplementary instruction sessions in a block schedule that runs from 9:00 a.m. to 3:00 p.m., Monday through Thursday, and 8:30 a.m. to noon on Friday for certain math and English classes and the Biology lab. Biology students must also commit to an additional lab on Mondays, from 3:30 to 7:20 p.m.

Because focus and engagement are two key success strategies for student retention, class attendance is required and carefully monitored by all Bridge instructors, with academic coaches proactively contacting students as soon as attendance or performance problems are identified. The rigorous academic schedule combined with frequent, intrusive interaction with the academic coaches, the movement of students through the day in cohorts, and the supplemental tutoring and study night sessions encourages student engagement and makes it very difficult for students to flounder unnoticed.

Outside of the class time, Bridge students are provided additional support in a variety of venues. Optional evening study labs staffed by FYT instructors are well-attended, and TRiO Bridge students participate in further study sessions managed by TRiO staff. Some academic coaches and Bridge Peer Mentors (Bridge program alumni) meet with small cohorts over lunch for informal conversation and support. The Biology instructors have also met with their students over lunches prior to an exam to create more opportunities for students to ask questions and test their understanding in an informal setting. This iteration of Bengal Bridge is an immersion experience—for both students and staff.

What began as a summer "jumpstart" for a closely-monitored and tight-knit cohort of students in a specific demographic is now becoming the academic equivalent of "boot camp" for a larger, diverse population more representative of the typical fall semester student demographics in terms of the range of academic performance, financial resources, etc. This expanded Bengal Bridge is in an early stage of development and still evolving, and we realized that we needed a more comprehensive understanding of the Bridge population if we are to accurately assess Bridge's impact on FY student retention. To begin this process, we began collecting descriptive statistics and completing various surface level analyses. Ideally the data will allow us to better serve future students, improve allocation of resources, and conclude whether participation in Bengal Bridge, in its present iteration, increases retention to the fall semester and beyond.

Beginning the Analysis

Given the rigorous time and intellectual demands of Bengal Bridge, the success of students in the program is largely dependent upon attending class, or what we have defined as "active enrollment." Therefore, if a student did not attend class and, thus, earned a 0.0 GPA on a 4-point scale, we found it necessary to exclude the student from the study. The following summarizes our initial findings.

Descriptive Statistics

The initial observations used in this analysis were supplied by Institutional Research at ISU in January 2017 for each semester, including summer, a Bengal Bridge student attended ISU for the time-period summer 2013 through spring 2017. An updated list including spring 2017 grades was generated in September 2017. Institutional Research provided 36 variables, including both qualitative and quantitative; however, only the 14 variables listed in Table 1 were selected for this study.

Many students did not have both an ACT and SAT score; therefore, a standardized score was created using national averages and standard deviations. To be consistent with ISU Admissions, the higher of the two values was used in this analysis. It should also be noted that approximately 20% of students did not have a low-income or first-generation indicator.

Table 1

Qualitative and Quantitative Variables

Qualitative Variables	Quantitative Variables
Bridge Term (Cohort Definition)	SAT Composite
Race	ACT Composite
Low-income Indicator	High School GPA
First-generation Indicator	Bridge Term GPA
Gender	Bridge Cumulative GPA
	Fall Term Post Bridge Term GPA
	Fall Term Post Bridge Cumulative GPA
	Spring Term Post Bridge Term GPA
	Spring Term Post Bridge Cumulative GPA

Bridge Cohort

The active enrollment increased by 250% from summer 2013 to summer 2016, which can be credited to the increase in resources and the expansion of the acceptance criteria when Bengal Bridge moved under the direction of FYT as mentioned previously. The retention levels for summer to fall have consistently been approximately 70%, with the exception of summer 2014, when the retention level peaked at 92%. This begs the question: Why was retention so high that summer? One possible answer is the small size of the cohort. Summer 2014 had the smallest active enrollment and by the spring retained more students than the larger 2013 and 2015 cohorts. How can we extrapolate these results to larger Bengal Bridge classes in the future? No statistical conclusion has been made, but subsequent analyses will hopefully answer such questions. Figure 1 summarizes active enrollment for the 2013-2016 Bengal Bridge cohorts.

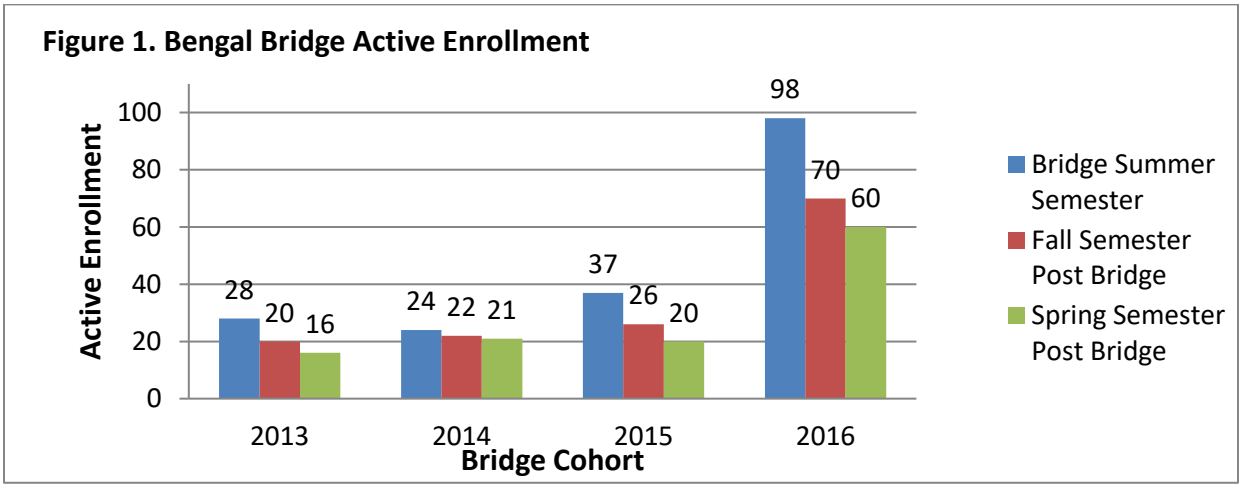

Figure 1. Bengal Bridge Student Records. Jan. 2017. Raw data. Idaho State University - Institutional Research, Pocatello, ID.

Besides enrollment, it was necessary to assess the academic readiness and achievements of Bridge students. In general, there was little variation between the cohorts when quantifying high school GPA, standardized test scores, Bridge term GPA, fall term GPA, and spring term GPA, with the exception of lower test scores for the 2013 and 2014 cohorts along with a lower GPA for the fall term post-Bridge for the 2015 cohort. As demonstrated in Table 2, the general pattern for all cohorts saw a peak in GPA during the Bridge semester followed by poorer fall and spring GPA.

Table 2

Cohort Mean GPA Pre-, During, and Post-Bridge and Standardized Test Score

	Mean GPA	**Mean**	**Mean Term GPA**		
Bridge Cohort	**High School**	**Standardized Test Score**	**Bridge**	**Fall Post-Bridge**	**Spring Post-Bridge**
2013	3.2	-0.8	3.2	2.7	2.3
2014	3.1	-0.9	3.2	2.6	2.6
2015	3.2	-0.4	3.5	2.0	2.3
2016	3.2	-0.2	3.1	2.5	2.6
Total	**3.2**	**-0.5**	**3.2**	**2.5**	**2.5**

The qualitative variables focused on for this initial study were the first-generation indicator, low-income indicator, and gender. Comparing the cohorts, just over half of each cohort was a first-generation student, with the exception of the 2016 cohort. However, the 2016 cohort saw the largest proportion of low-income students at 37%. All cohorts were composed of more females than males, with a ratio of 13:7, approximately. Table 3 summarizes these demographic findings.

Table 3

Cohort Demographics

Bridge Cohort	**% First-generation**	**% Low-income**	**% Female**
2013	54%	14%	68%
2014	58%	4%	71%
2015	54%	8%	65%
2016	35%	37%	65%
Total	**44%**	**24%**	**66%**

Principle Component Analysis

A Principle Component Analysis was conducted to determine whether there is a way to explain this group of students using fewer variables and to identify dominant variables. With many quantitative variables of interest, a principal component analysis was used to address whether these variables could be condensed

into fewer compounded variables or if any dominate variable would emerge. A principal component analysis is a technique used to emphasize variation, bring out patterns in datasets, and to make data easier to explore. The sample was comprised of the 117 actively enrolled students, where each student completed his or her Bridge summer term, fall term post-Bridge, and spring term post-Bridge. The original eight quantitative variables consisted of high school GPA, standardized test score, Bridge term GPA, Bridge cumulative GPA, fall term GPA, fall cumulative GPA, spring term GPA, and spring cumulative GPA.

The principle component analysis permitted us to compress eight variables into three principle components. The dominate variables within each component are listed in Table 4. The components are listed in order of value, where the first component contributes the most, then the second, and finally the third. It should be noted that high school GPA and fall term GPA did not emerge in any of the principal components. These three new components could be used for upcoming analyses, specifically, since their distributions follow a multivariate normal model, unlike the individual variables.

Table 4

Principal Components and Dominant Variables

Principal Component	**Dominant Variables**		
First	Cumulative Fall GPA	Cumulative Spring GPA	
Second	Bridge Term GPA	Spring Term GPA	Bridge Cumulative GPA
Third	Standardized Test Score		

Cluster Analysis

A cluster analysis was performed to determine what qualitative similarities and differences would emerge if the students were grouped by academic performance. A cluster analysis is a statistical grouping technique that assigns observations to a specific group based on similar attributes. With multiple approaches to cluster analyses, the K-Means cluster technique was used in this study. This method partitions observations into a designated cluster by mapping each observation into the cluster with the nearest means. The sample size was 117 students, consisting of students who were actively enrolled from their Bridge term through the following spring term. The quantitative characteristics used for clustering these students were comprised of high school GPA, standardized test score, Bridge term GPA, fall term GPA, and spring term GPA. Table 5 demonstrates the results, by cluster, of the average values from each quantitative academic variable.

Table 5

Results of Average Values by Cluster

Cluster	# of Students (% by Group)	Mean High School GPA	Mean Standardized Test Score	Mean Bridge Term GPA	Mean Fall Term GPA	Mean Spring Term GPA
1	22 (19%)	2.8	-1.0	2.6	1.5	1.5
2	45 (38%)	3.2	-0.9	3.5	2.7	2.6
3	32 (27%)	3.7	0.0	3.9	3.4	3.4
4	18 (15%)	3.5	0.6	3.5	2.1	1.9

Cluster 3 has the highest GPAs throughout all terms and the second-to-highest standardized test scores, while Cluster 4 performed better academically in high school and Bridge, but saw a decline in academic performance in the subsequent semesters. Most students were grouped into Cluster 2, where scores and GPAs fell somewhere in the middle. Cluster 1, overall, had the poorest academic performance, with Bridge GPAs falling below a B-average, and their fall and spring GPAs falling below a C-average.

To participate in Bengal Bridge, students must have some factor that could inhibit their success at the university level. As previously mentioned, these factors can include, but are not limited to, low test scores, first generation, low income, etc. Since we have begun offering a STEM track in Bengal Bridge, gender is also a variable of interest to us, given the proportionately low numbers of females in STEM disciplines. In this cluster analysis, the next goal was to use quantitative variables to group students and then analyze similarities and differences between the clusters using categorical aspects. Table 6 displays the results. Cluster 1 and Cluster 2 had over 50% first-generation students. Cluster 1 performed poorly academically (Table 5), although no causational relationship can be inferred without further analyses. Cluster 3 was predominately female and topped the groups academically. Once again, no causational relationship can be implied.

Table 6

Within Each Cluster, the Percent of First-generation, Low-income, and Female Students

Cluster	First-generation	Low-income	Female
1	59%	18%	73%
2	56%	18%	67%
3	31%	28%	91%
4	33%	28%	56%

In general, the conclusion for the cluster analysis is somewhat inconclusive. The observation of the predominately female group in Cluster 3 is interesting, but no other distinctive patterns emerged. After running many cluster analyses with different variables, different size groups, and different methods, no

consistent pattern surfaced. Either there is a pattern that is still to be found, or our Bridge students, in terms of comparing performance with demographics, are fairly homogenous.

Limitations and Future Analyses

This is only the beginning of many analyses to aide in the successful evolution of Idaho State University's Bengal Bridge, but we are already identifying information we need to gather for subsequent analyses. The 2013-2015 cohorts have limiting sample sizes and the programs were conducted under different leadership. Additionally, the sample size for each of the cohorts continues to diminish semester after semester, reinforcing the importance of larger cohorts for the completion of a comprehensive retention study. For example, by 2017, the 2013 cohort had only seven students still enrolled. For a full retention study, four years of data from each cohort with acceptable sample sizes is needed. There are few continuous quantitative variables that describe this population, so analysis on various discrete variables such as credits completed before beginning Bridge and credits passed each semester would be useful. We also plan to complete comparison analyses with similar Bridge programs across the country and the ISU general population to help determine the efficacy of the program.

Conclusion

Bengal Bridge is one part of a comprehensive program designed to facilitate first-year student success at ISU. What we have realized from our initial research is that the first-year population that benefits from Bridge is sufficiently impeded by a lack of a culture of matriculation to higher education that they need one more piece in place in our first-year retention plan. Bridge is an intensely-supported learning environment for our primarily first-generation student population, and many of our Bridge alumni report feeling more confident as they begin fall classes, but our initial data suggests that, academically and socially, the transition into the regular semester is still very challenging. In coaching appointments and informal conversations, students have reported that the fall semester was so "different" that they felt a little panicky and "forgot to apply" success strategies they had learned in Bridge.

In fall 2017, we began developing plans to provide continued support as these students take that next significant step. Their average GPA and retention numbers in Bridge indicate that they are capable of handling rigorous academic demands, but we need to provide scaffolding to integrate them more fully into the fall university culture. The summer 2018 Bridge ACAD courses will include training in transitioning to the fall semester (what to expect; how to adapt) and a revised academic coaching plan for Bridge cohorts transitioning to fall that will ensure these students are connected to the fall FY student cohorts.

Resources

College Board. (2014). *2014 College Bound Seniors: Total Group Profile Report*. Retrieved from http://media.collegeboard.com/digitalServices/pdf/sat/TotalGroup-2014.pdf

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About the Authors

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