

Learning Experiences in a Summer Bridge Program for Successful Retention of Post-Secondary Hispanic Students in Puerto Rico

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Abstract

Due to the natural disasters in Puerto Rico, students' academic performance has been affected and dropouts have increased. Moreover, COVID- 19 intensified the challenge for post-secondary education, resulting in students obtaining lower scores for college entrance exams. Students are not academically prepared for the transition to university. To address these challenges at the Inter American University of Puerto Rico, Metropolitan Campus we developed an Intensive Summer Bridge Academy (ISBA) to address the gaps in knowledge and skills of developmental Mathematics education. In 2021 the ISBA consisted only of coursework with ten students registered. Because of low enrollment and low knowledge gain in 2021, we combined coursework with extracurricular activities of social-mental health including peer tutoring, mindfulness, and stress management and fourteen students registered in 2022. The two ISBA courses were taught using technology in the *EducoSoft* learning management system (LMS). Students in the 2021 had lower average grades and spent fewer (53) hours using the LMS when compared to students from 2022 who had higher average grades and spent an average of 55 hours using the platform. Majority of ISBA students (93 %) passed Mathematics when compared to institutional baseline of 53 %. All ISBA students were retained when compared to 69% of institutional retention. The students in the ISBA were satisfied with extracurricular activities. Students agreed in 2022 that the extracurricular activities were beneficial for their academic and personal development. The combination of technology and student support activities result in students successfully completing their developmental education in Mathematics.

Keywords: Intensive Summer Bridge Academy, Hispanics, Developmental Education, Mathematics

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Introduction

The Inter-American University of Puerto Rico (IAUPR) System is composed of 11 campuses around the island of Puerto Rico. Metropolitan Campus (MC) is in San Juan, the capital of Puerto Rico. The mission of MC is to serve the diverse needs and interests of its students and surrounding community. It offers technical certificates, associate's, baccalaureate, and graduate degrees, as well as professional certificates. Its total enrollment for fall 2018 was 7,831 students (Fig 1). From the total, 70.8% were enrolled in associate or bachelor's degree programs while 29.2% were graduate students. Of the total of undergraduate students, 80.2% were enrolled in a full-time basis and 28.9% were first generation college students. MC, just like other colleges and universities in Puerto Rico, has suffered decreases in enrollment in recent years because of the financial difficulties and economic dislocations over the past decade. Hurricane Maria also caused widespread devastation, which caused further migration to the mainland U.S., also resulting in decreasing enrollment (Fig 1). The declining enrollment has placed excessive pressure on MC's financial ability to meet the needs of all students and especially the incoming freshmen, 80% who are arriving with inadequate basic skills in Math and English. Underprepared students are three times as likely to drop out of college and of the ones who stay, many face the disastrous reality of running out of financial aid before they complete their studies.

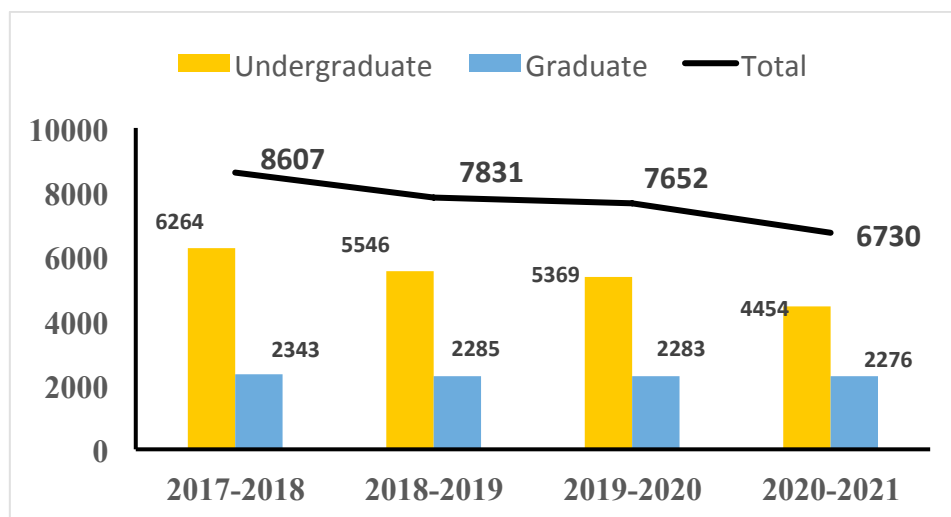


Figure 1: Fall-to-fall enrollment 2017 to 2021. Source: *Office of Research, Evaluation and Planning, IPEDS.*

The student body comprises of 90 % Hispanic students, mostly female (60.1%), comprising of persons returning to complete their degrees, and young students who work and study at the same time. The percentage of MC students that reported a household family income under \$24,000 is 65.4. In fall 2018, there were 652 first year (first time) students enrolled at MC, 54.1% of whom attended Puerto Rico Public Schools and 90.2% receive financial aid. Many incoming freshmen of MC need remediation; and do not advance to upper-level courses at an acceptable rate, hence take more than six years to graduate. In recent years retention and graduation rates have decreased by 3 % and 6% respectively when compared with the previous cohort (Tables 1 and 2).

Cohort	Enrollment	Retention	%
2014	723	518	72%
2015	588	420	71%
2016	555	402	72%
2017	647	447	69%

Table 1: Retention rates of students enrolled in bachelor’s programs from 1st to 2nd year

Cohort	4-year			6-year	
	Enrollment	Graduates	Rate	Graduates	Rate
2008	685	129	19%	224	33%
2009	657	115	18%	191	29%
2010	734	170	23%	264	36%
2011	865	188	22%	324	37%
2012	735	140	19%	231	31%

Source: Enrollment Questionnaire of term 2015-16 (Cohort 2014), 2016-17 (Cohort 2015) y 2017-18 (Cohort 2016). Office of Research, Evaluation and Planning, IPEDS

Table 2: Graduation rates-undergraduate level

Intensive Summer Bridge Academy Framework

With funding from the US Department of Education (Title V, P031S200066) MC remodeled the Active Learning Center of Excellence (ALCE) to integrate several students support services. The ALCE includes an “early access/early readiness” strategy that specifically addresses identified underprepared student needs. MC has put significant effort into building connections to feeder high schools. This strategy builds on current efforts and provide secondary students and teachers the opportunity to enroll in MC’s ALCE “Intensive Summer Bridge” academies (ISBA) to develop academic and technology skills. High school teacher training and faculty training was designed to make best use of technologies and social media. The objective of the ISBA was to help MC freshmen to strengthen their performance in basic skills courses such as Math as withdrawal and failure rates were high (Table 3).

Developmental Education Courses	Failure/Withdrawal Rates
Mathematics	47 %
Spanish	31 %
English	27 %

Source: Centro de Investigación Institucional y Fondos Externos 2018.

Table 3: Remedial courses results of Fall 2018

National research has shown that ‘weekend colleges’ are not very effective in achieving learning outcomes. Instead, MC proposed a two-week long ISBAs that have been proven to have lasting effects in student learning and study behaviors (Howard and Sharpe, 2019). As Bir and Myrick (2015) suggest we consider whether an intensive summer bridge academy built upon improving Math basic skills might be able “to provide a significant [improvement] to long-term academic performance” (p. 23).

Therefore, influenced by the work of Borocho et al (2007) during the spring of 2021 the ALCE project team sent a promotional flyer via email to all newly admitted students encouraging

them to participate in the summer bridge academy. Further, team members called all students admitted for Fall 2021 to provide them with information on the opportunity to improve and advance their Math and English knowledge in developmental courses. The recruitment for the hybrid courses was difficult due to the uncertainty of the spread of the COVID-19 virus and the lack of vaccines. The low recruitment resulted in only two courses GEMA 1000 (Quantitative Reasoning), a Mathematics course for non-science majors and GEMA 1200 (Fundamentals of Algebra) for STEM majors was offered. All coursework in the ISBA were offered through the online technology using *EducoSoft* learning management system (LMS) that included course materials, practice exams, and exams. The students registered in the courses were required to complete a pretest which determined their level of knowledge in Mathematics. The courses were taught in Spanish and tutoring was provided virtually and face-to-face at the ALCE. At the end of the course a posttest was administered to determine knowledge gain (Hake, 2007; Nissen, Talbot, Thompson, and Van Dusen, 2016) during both ISBA.

Due to the low enrollment in the ISBA in 2021 and recognizing the serve mental crisis for teens and college students, we developed a new active learning ISBA framework to address students' needs beyond the academic gaps of high school (Thakur, 2020). Below we present the adjustments made to the ISBA framework from 2021 to 2022 in the context of transitioning from lockdowns of COVID 19 to face-to-face ISBA.

Year 2021	Year 2022
GEMA 1000 and GEMA 1200 Hybrid Courses	GEMA 1000 and GEMA 1200 Face-to-face course
Two different faculty members taught the courses	Same faculty member taught both courses
Used <i>EducoSoft</i> Learning Management System (included course content, exam practice, exams)	Used <i>EducoSoft</i> Learning Management System (course content, exam practice, exams)
Pre-posttest for knowledge gain	Pre-posttest for knowledge gain
Hybrid Tutoring at ALCE	Face-to-face Tutoring at ALCE
2 weeks	2 weeks
No extracurricular activities	7 extracurricular activities
No student Satisfaction Surveys	Student Satisfaction Surveys
Mornings only	Mornings and afternoons
No lunch included	Lunch included for students

Table 4: A comparative analysis of the ISBA Framework offered at MC for 2021 and 2022

Conclusions

During the ISBA 2021 students spent an average of fifty-three hours while in the ISBA 2022 students spent an average of fifty-five hours using the platform during the two-week period of the program. Consequently, students who participated in ISBA 2021 had lower average grades (76%) when compared to students from 2022 (84%). Furthermore, we found that students in the GEMA 1000 in 2021 courses did worse after the course when compared to students in 2022. There was low knowledge gain (Hake, 2007) and, in some cases, negative results (see Table 5 and 6). Students were not engaged in the course and did not have the

interest to complete the posttest. Similar results were observed for the GEMA 1200 course; however, we did not see negative results in the posttest (see Table 7 and 8).

STUDENT	PRETEST	POSTTEST	DIF	% HAKE GAIN
1	41.91	57.14	15.23	26.2
2	81.91	73.8	-8.11	-44.8
3	48.57	40	-8.57	-16.7
4	26.66	20.49	-6.17	-8.4
5	71.43	30.46	-40.97	-143.4
6	51.43	57.14	5.71	11.8

Table 5: GEMA 1000 pre-post test score with percent Hake Gain- 2021

STUDENT	PRETEST	POSTTEST	DIF	% HAKE GAIN
1	17.5	52.5	35	42.4
2	25	85	60	80.0
3	35	97.5	62.5	96.2
4	33.75	77.5	43.77	66.0
5	22.5	80	59.5	74.2
6	10	53.75	43.75	48.6
7	10	65	55	61.1
8	10	82.5	72.5	80.6
9	17.5	67.5	50	60.6

Table 6: GEMA 1000 pre-post test score with percent Hake Gain- 2022

STUDENT	PRETEST	POSTTEST	DIF	% HAKE GAIN
1	40	65.2	25.2	42.1
2	47.1	65	17.9	33.8
3	41.4	84.8	43.3	74
4	47.1	88.1	41	77.5

Table 7: GEMA 1200 pre-post test score with percent Hake Gain -2021

STUDENT	PRETEST	POSTTEST	DIF	% HAKE GAIN
1	22.5	NP		
2	12.5	65	52.5	60
3	28.8	62.5	33.8	47.4
4	22.5	77.5	55	71
5	15	70	55	64.7

Table 8: GEMA 1200 pre-post test score with percent Hake Gain- 2022

Workshop	Excellent	Very Satisfied	Satisfied	Deficient	No Response
Mindfulness	89	8	3	0	1
Limitless Art	95	5	0	0	0
Mindful Eating	94	6	0	0	0
Time Management	91	9	0	0	0
Transition to University Life	83	16	0	0	1
Emotions Management	91	8	0	0	1
Problem coping skills	81	17	1	0	1

Table 9: Percent of overall student satisfaction for extracurricular activities in ISBA 22

The workshop content was purposely designed to include topics such as diversity, working in teams, inclusion of students with learning disabilities, connection to nature and spirit (Thakur, 2020). Overall, the students self-reported satisfaction with the extracurricular activities planned for the ISBA in 2022. No students found the content and activities to be deficient; however, 4 students did not respond (Table 9). Mindful eating and limitless art activities had the highest satisfaction. The Assessment of the ISBA showed 100% of students agreed that the activities and workshops in ISBA of 2022 were relevant and beneficial for their academic and personal development. This confirms what Turner, McCallum, and Benson (2021) say about how “social interactions with faculty, peers, peer-advisors and advisors influenced [students] college experience” (p. 7).

The ISBA was successful since students in ISBA had a higher pass rate (100%) in Math when compared to the institutional baseline (53 % passing rate) during the first year of college. Also, 100% students who participated the ISBA were retained in fall when compared to the 69% institutional retention rate. The learning experiences using technology in our multidisciplinary ISBAs provided Hispanic students the tools to strengthen their resilience and a guided path towards achieving their academic goals.

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