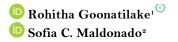
Building Scholars Program: Fostering Student Self-Efficacy in Higher Education







¹²⁷Department of Mathematics and Physics, Texas A&M International University, Texas, USA. ¹Email: <u>harag@tamiu.edu</u> Tel: (956)326-2588 ²Email: <u>sofiac.maldonado@tamiu.edu</u> Tel: (956)326-2582

ABSTRACT

The goal of the Building Scholars program, funded by the US Department of Education under the Developing Hispanic-serving Institutions Program, is a partnership between Texas A&M International University (TAMIU) and Laredo College (LC) to increase the number of Hispanic and low-income students attaining post-secondary certifications, associate and bachelor's degrees. It aims to prepare students to compete for positions in graduate and professional schools; thus, increasing the competency and diversity of the minority workforce. Building Scholars consists of carefully chosen activities developed by both TAMIU and LC to achieve the objectives of the program initiatives. For TAMIU, the goal is to engage and retain Hispanic students by implementing well-designed activities through freshman seminars, undergraduate research across disciplines, faculty support, travel, faculty development activities, and a summer research seminar. Faculty support, in terms of travel and equipment, is provided to improve student engagement in their programs of study and furtherance of higher education. The majority of program activities at TAMIU are intertwined with the University's Quality Enhancement Plan (QEP) to build, integrate, and sustain undergraduate research practices and programs, with an emphasis on applied critical thinking. Students are involved in hands-on mentored activities with faculty in order to identify the various structured outlets where their critical thinking and research skills can be sharpened.

Keywords: Hispanic students, Undergraduate research, Faculty support, Student tracking, Graduation rates, Bridge program.

DOI: 10.20448/804.4.2.325.338

Citation | Rohitha Goonatilake; Sofia C. Maldonado (2019). Building Scholars Program: Fostering Student Self-Efficacy in Higher Education. American Journal of Education and Learning, 4(2): 325-338.

Copyright: This work is licensed under a Creative Commons Attribution 3.0 License

Funding: This work was primarily supported by the US Department of Education funded Title V - Building Scholars program grant (award #: P031S140130), with additional support from the TAMIU College of Arts and Sciences and the Department of Mathematics and Physics. **Competing Interests:** The authors declare that they have no competing interests.

History: Received: 27 June 2019/ Revised: 29 July 2019/ Accepted: 20 August 2019/ Published: 14 October 2019

Publisher: Online Science Publishing

Highlights of this paper

- This paper highlights the extent of measures taken by the program, in its fifth year of implementation.
- To promote Hispanic students' success in terms of increasing the number of first-time, full-time, and degree-seeking students at the institution, the student retention and graduation rates, and the number of students seeking graduate and professional schools upon graduation.

1. INTRODUCTION

Faculty support is fundamental to building successful students' progress as a result of teacher efficacy, or considerable professional adequacy. Particularly, the teacher's belief that they can affect how well students learn has been shown to have a significant impact on student achievements. Accepting responsibility for their students' achievement and persistence in the face of challenging situations are important factors in building the aforementioned efficacy (Tschannen-Moran and Barr, 2004). In order to better understand students, teachers should assess students' self-efficacy beliefs in the classroom each semester or each year with pre-tests and post-tests just as they assess subject skills. While a student's school achievement is considered a positive predictor of their college performances, including their GPA, their current learning environment is strongly related to all types of learning outcomes at university (Lizzio et al., 2002). Teachers should tally responses to individual items to find out which beliefs are most negative or most positive in the classroom. This may reveal the effectiveness of teaching methods and allow for the identification of negative beliefs. Students who have good academic performance in the classroom and perceive faculty as concerned about their well-being have better academicals superiority (Kuh and Hu, 2001). Students' self-efficacy beliefs should have an impact on instructional decisions since they either have the ability to positively or negatively influence higher education (Rymer, 2017). This has greater impact in the areas of academic advising, administrative policies and practices, enrollment management, faculty development, faculty reward system, student orientation programs, residential life, and student affairs programming (Braxton and McClendon, 2001). Researchers have frequently found that the higher the induced level of self-efficacy, the greater is performance attainments (Bandura et al., 1982).

The Building Scholars program, in its fifth year of implementation, has been effective in implementing a strategy to promote Hispanic students' success in terms of increasing the number of first-time, full-time, and degree-seeking students at the institution, the student retention and graduation rates, and the number of students seeking graduate and professional schools upon graduation.

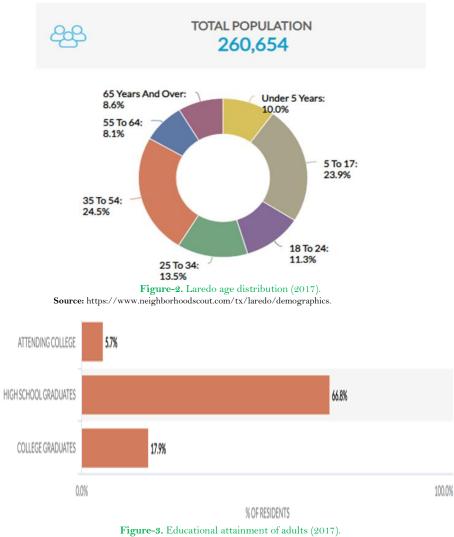
2. DEMOGRAPHIC PROFILE

The classroom interactions and student perceptions varied based on different demographic characteristics in the classroom (Brady and Eisler, 1999). Laredo is a South Texas city, located on the Mexican border. Figure 1 through 6 provide a graphical representation of the city's demographic profile. Laredo covers nine zip codes (78040, 78041, 78043, 78044, 78045, 78046, 78371, 78019, and 78344). Once considered the fastest growing city in the U.S. with college education and beyond and with a per capita income of \$15,956, compared to \$29,829 nationally, as seen in Figure 4, a sustainable workforce is required to serve its rapidly growing population. It already has an increased high school graduate population of 66.8%. Nevertheless, only 5.7% of the residents are currently attending colleges and universities and 17.9% have a college degree, according to Figure 3. Laredo has a population of 260,654 and is the 80th largest city in the United States. Figure 1 shows that the population density in 2010 was 2,655.5 per sq. mi, which is 2,757.5% higher than the Texas average and 3,038% higher than the national average. Laredo has a somewhat young population, as illustrated in Figure 2, 58.7% are under 35 years of age. As a result of its proximity

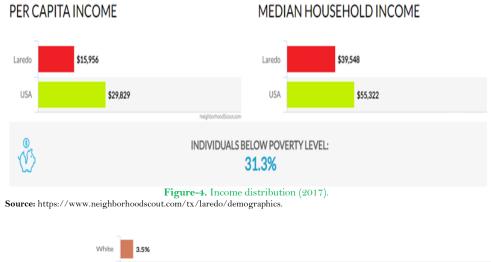
to Mexico, 26.6% of Laredo residents are foreign-born, 95.4% are Hispanic or Latino, as indicated in Figure 5, and 89.5% are Spanish speakers, as displayed in Figure 6.

All Topics	Q Laredo city, 🛛 🖬	Q, Texas	UNITED STATES
Population			
Population estimates, July 1, 2018, (V2018)	NA	28,701,845	327,167,434
Population estimates, July 1, 2017, (V2017)	260,654	28,304,596	325,719,178
Population, Census, April 1, 2010	236,091	25,145,561	308,745,538
Population Characteristics			
Foreign born persons, percent, 2013-2017	26.6%	16.9%	13.4%
Geography			
Population per square mile, 2010	2,655.5	96.3	87.4
Land area in square miles, 2010	88.91	261,231.71	3,531,905.43

Figure-1. Laredo demographic profile (2017). Source: https://www.census.gov/quickfacts/fact/table/laredocitytexas,tx,US/POP060210#POP060210.

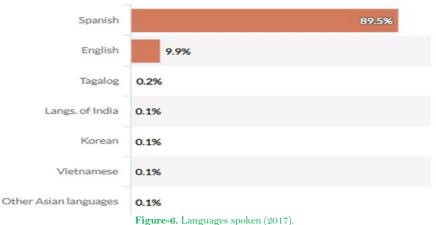








Source: https://www.neighborhoodscout.com/tx/laredo/demographics.



Source: https://www.neighborhoodscout.com/tx/laredo/demographics.

3. PROGRAM ESSENTIALS AND FREEDOM TO CREATE

Student perceptions strongly correlated with their own upbringings based on the unique demographic characteristics in their classrooms (Brady and Eisler, 1999). The demographic profiles in Laredo, Texas, portrayed in the latter section, estimate a huge percentage of Hispanics in this emerging population with a low educational attainment, needing a rigorous intervention in and out of classrooms. Students who are pursuing to enter higher education institutes, such as TAMIU and LC, are mostly the first time college seekers. In some cases, no members of their families and immediate families have attended colleges at all. Therefore, the experience is new and unique. This growing population not only needs financial support to seek a college education, but also to continue with an

education endeavor. Building Scholars is a multifaceted program, tailored towards the sustainability of those who seek higher education in graduate and professional schools, thereafter.

Researchers explained how students must escape a negative mindset towards higher education. Fostering more positive educational attitudes can encourage them to overcome the system. Students with high self-efficacy show more persistence. The mission for academic projects, such as Building Scholars, is to achieve interest in establishing a new academic group with the following main functions in mind:

- 1. To provide organized activity in the large field between the fields of student projects and the field of pure research.
- 2. To form a medium of communication and a forum for the exchange of ideas between faculty and others interested in the collegiate field.
- 3. To furnish a place for publication of scientific articles and papers adapted to this intermediate field.
- 4. To publish historical articles, book reviews, notes and news, and indeed any matters of interest to the great body of men and women related to this field.

Some of the activities in Building Scholars are geared towards creating an atmosphere where students have an opportunity to create. Even though students are under the direction of an assigned mentor, many of them talked about the freedom they experienced when coming up with ideas and materializing them, in contrast with their prior experiences of graded performance in the subject area. A study by Feldman (1988) indicates that both students and faculty generally placed moderate importance on teachers being open to class discussion and the opinions of others. While a student's school achievement is considered a positive predictor of their college performances, including their GPA, their current learning environment is strongly related to all types of learning outcomes at the academic institutions (Lizzio *et al.*, 2002).

This, together with the ability to collaborate, a novel multidimensional approach, and a new discipline-specific freedom, would create a whole person, much needed in the society for innovation. Analysis of any project endeavor produced three main themes that were central to the equitable outcomes: 1) collaborative nature of the project, 2) multidimensional approach to the problem, and 3) freedom to create. Boaler *et al.* (2019) have come up with the academic framework for someone to become a whole person and for the complete success to occur, as provided in Figure 7. By replicating this structure for all possible other disciplines, Building Scholars is designed taking into consideration these factors where everyone can become scholars, regardless of the discipline they may choose.



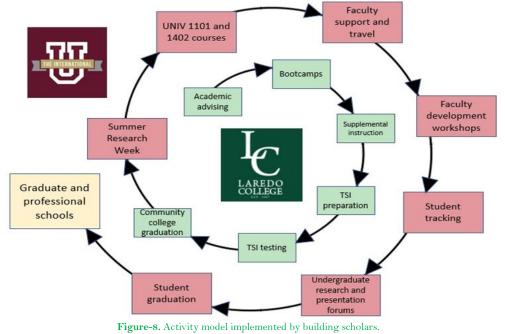
Figure-7. Components to become a whole perso. **Source:** Boaler *et al.* (2019).

When students are offered the opportunity to challenge themselves through collaborative experiences, they address multi-dimensional problems unique to their discipline and engage in their discipline-specific freedom, and, as a result, stay enrolled and succeed.

4. FOCUS OF BUILDING SCHOLARS

There is an indirect but important link between college recruitment efforts and a student's college choice that will finally link to student perceptions of excellence. Hence, we evaluate everything from recruitment activities based on how much it has influenced the opinions (Kealy and Rockel, 1987). The Building Scholars consist of activities developed by both TAMIU and LC, including: (a) provide undergraduate research and presentation opportunities across disciplines and develop a Summer Research Week, (b) implement a program for departmental faculty to teach University Seminar courses such as UNIV 1102 to first-year students that is discipline specific, (c) provide specialized resources and instruction for all developmental students, (d) improve the number of full-time students who have a developmental background that persist and graduate, (e) fund travel to professional conferences for training, building collaborations & presenting research results, (f) host an annual faculty development training for faculty at both institutions, (g) perform analysis on current protocols for sharing data and make recommendations and improvements, and (h) track student progress and retention, well formulated in Figure 8, as the students seek community college entrance for the purpose of completion of graduate school or professional school in a timely manner.

Each component of the program is geared towards serving jointly the predominately-Hispanic community, a group historically underrepresented in research careers, and positions of leadership in the nation. The Building Scholars at LC works with students beginning in developmental education as a component that enforces the best practice available for students in a community college setting. That is, having meetings with students to talk about their progress and their degree plan at least twice during a semester. The scope, purpose, and outcomes of developmental education in community colleges require increasing graduation rates and decreasing costs. The educators and students must prove the value and worth of developmental education delivered through assessment process (Munsch *et al.*, 2015).



Source: Building scholars.

The collaborative nature of the grant, which eases the transition from LC to TAMIU, is essential for the program. For TAMIU, the goal to engage and retain Hispanic students is implemented through, among other things, freshman seminars, undergraduate research across disciplines, faculty support in terms of equipment, travel, faculty development activities to equip the faculty with innovative strategies, and a summer research seminar. To this end, student and faculty presentations are facilitated locally and nationally. Faculty support, in terms of travel and equipment, is provided to bridge the gap between knowledge transfers from faculty to students to improve student engagements in the programs of study. The majority of program activities at TAMIU are intertwined with its Quality Enhancement Plan (QEP), as a part of the University's Southern Association of Colleges and Schools Commission on Colleges accreditation process (SACSCOC, 2019). This solidifies their curiosity for college programs and succeed in the programs regardless of the discipline. Through a transfer agreement between the two institutions, students will not lose any credits during the process. These credits are accepted for work completed in other institutions approved by the appropriate regional accrediting agency. A well-designed transfer orientation at TAMIU is an added feature that helps introduce students to a four-year college setting. Transfer of courses from other institutions in the state of Texas to TAMIU is guided and controlled by the general provisions of the Texas Higher Education Coordinating Board (THECB) Rules and Regulations regarding the transfer of credit, core curriculum and field of study courses. Reverse transfer process is a possible option for students who are in need of completing credits for associate degrees at LC.

Adequate availability of faculty development is emphasized for students to gain access to dominance in the subject matter (Rendón *et al.*, 2018). While students are typically more adept at using technology as a learning tool in and out of the classroom, participants agreed that some faculty members might need additional development to keep up with evolving technology. The participants are encouraged with the acquisition of mini-grants for faculty who want to strengthen their technical skills to support their teaching. Mini-grants for faculty who are self-aware about their need to change and improve their pedagogy would be important. A study by Calcagno (2007) suggests that the impacts of both mathematics and reading remediation were positive in terms of the total (remedial and college-level) credits earned over six years and that students in mathematics and reading remediation earned 7.2 and 2.8 more credits than non-remedial students, respectively. Moreover, students with better academic preparation and support have higher rates of degree completion (Rendón *et al.*, 2018). Lack of academic preparation lands students in developmental education, which becomes a barrier to their academic progress. College educators feel that there should be leadership to help address these issues because it is a huge problem faced not only by Hispanics, but by all Texas students, as they are not ready for college entrance. Oftentimes, many schools lack the courses to adequately prepare the students for college survival (Hurtado and Kamimura, 2003). Academic advising similar to that of Building Scholars is in place to address these concerns and other.

5. AGGREGATES OF SUCCESSES (TO-DATE)

Both LC and TAMIU conduct activities and initiatives to achieve success among students. From high school students seeking admission to college programs, then to graduate and professional schools, the Building Scholars has something to offer. The TSI Assessment (TSIA) is part of the Texas Success Initiative program designed to help the colleges or universities determine if the students are ready for college-level coursework in the areas of reading, writing, and mathematics. On the part of LC, for those who seek community college admission, and thereafter college admission, student advising, academic boot camps, and SI instructions will further student success by attaining adequate TSI scores to secure college admission. TAMIU activities are multifaceted. This includes, among other things, providing incentives for faculty, who deliver UNIV 1101 Learning in a Global

Context-I and UNIV 1401 Signature Courses for the students in freshman courses. The latter is a large-group lecture and discussion class focusing on an interdisciplinary/transdisciplinary issue. Multiple sections may be offered with various topics and instructors to supplement the interests of everyone. The former focuses on models of academic success through assignments that apply learning theories and an international perspective to student coursework. Another focus of this endeavor is to support faculty in terms of travel and equipment for students to be able to engage in research and presentation skills. This is now being held every academic semester.

The Beacon student tracking system (https://www.campuslabs.com/) employed by the Building Scholars will address if the student seems to have any deficiency in the areas of academic upbringings. As of Spring 2019, 22 users of the University have subscribed to the system for specific student tracking. These include the University Advising and Mentoring Center (ACM), the Office of Financial Aid, the University Learning Center, the Office of Student Orientation, Leadership and Engagement (SOLE) and the Colleges of Arts and Sciences and Education. The usage has expanded throughout the campus for betterment of the campus community. Clearly, we need a better mechanism for betterment of the campus community that can identifying the students in need of intervention and helping them succeed in the programs. To this end, the relationships and differences between student responses on the Campus Labs and Student Strengths Inventory Survey administered during a pre freshman orientation, combined with usage of academic resources provided by the University Leaning Center (ULC) and final grades of college freshman enrolled in introductory mathematics courses at TAMIU seem to produce great advantages for faculty and administrators. Data analysis for this comparison includes independent sample t-tests, ANOVAS, and correlations (Ramsden, 1979). Hence, fostering students' motivation is imperative. Enjoyment in learning has called for greater and higher external standards that are considered appropriate steps to foster students' motivation. The effects of the organization of curricula, teaching, and assessment on student learning and appearances at the diverse demands, with the different academic environments suitable for their learning strategies, have been extensively examined (Ramsden, 1979). Additionally, providing funds for each student's activity distribution is in the upward trend to achieve the goals (Bassi et al., 2007). Connections between learning and personal goals can also be fostered by assessment methods employed and monitoring student progress. Nevertheless, how to effectively foster motivation to learn remains a hotly contested issue. Thus, the learning environments make a clear impact to academic success of a student (Lizzio et al., 2002). On the other hand, the orientations and constructs are particularly relevant to fostering students' motivation for success (Glynn et al., 2005). Generalizability is limited because of convenience sampling and participant attrition, so further research is needed for low-income students in rural areas as well as urban areas to see if findings are valid for multiple groups of students.

The Campus Labs Beacon student tracking software intends to establish a process to follow through the student success throughout their academic life. It is designed for campuses to enhance their retention and student success efforts from their orientation, from seeking financial assistance to attending something as simple as the University Learning Center (ULC). A study has been conducted in Spring 2019 to examine the relationships and differences between student responses on the Campus Labs (Beacon Student Tracking Software) with respect to Student Strengths Inventory (Academic Self Efficacy, Academic Success, Educational Commitment, Retention, and Resiliency), student usage of academic support provided by ULC and grades earned by college freshman enrolled in an introductory mathematics course at TAMIU. Data analysis conducted for this study included independent sample t-tests, ANOVAS and correlations. Data collected from a survey of size 373 (N = 373) confirmed positive weak correlations between student final grades and student visits and time spent at ULC. Additionally, the data validated positive weak correlations between student final grades and Student Strengths Inventory scores for Retention Probability, Academic Success and Academic Self Efficacy. An independent sample t-test indicated that

students who visited the ULC at least 3 times within one semester received a significantly higher grade in their college algebra course (M=2.82, SD=0.932) compared with students who visited the ULC less than three times (M=2.31, SD=1.259, t(372)=3.542, p < 0.05). Moreover, a One-Way ANOVA established that the mean Academic Success score on the Student Strengths Inventory was significantly different for at least one of the groups based on final letter grades ($F_{4,368}$ = 4.692, p < 0.05). Lastly, a One-Way ANOVA demonstrated that the mean Academic Selfefficacy student score on the Student Strengths Inventory was significantly different for at least one of the groups based on final letter grades ($F_{4, 368}$ = 4.330, p < 0.05). These results will be disseminated to the University Advising and Mentoring Center (ACM) and the Office of Student Orientation, Leadership and Engagement (SOLE) for further discussion and potential implementation of mentoring strategies and academic support services for incoming freshmen. Additional studies are being planned in this area to provide a more comprehensive and timely picture of this software's use (Contreras and Morales, 2019). Through these tools, the College of Education has also been able to harness previously untapped datasets to help make data-driven changes to program requirements, curriculum, and students resources; thus, delivering graduates who are successful teachers (TAMIU, 2018).

Laredo College is a learner-centered institution transforming students' lives through educational programs and to fulfill the dynamic needs of its local, regional, national, and global community services (http://www.laredo.edu/cms/mission.aspx). It also ensures access to passage for student success through excellent workforce and transfer programs, and continuing education. Table 1 provides the number of transfer students from LC as they begin relevant coursework at TAMIU through combined activities to achieve the institutional goals.

Semester	ster LC transfer count Enrollment		nent	Degrees awarded		
		Undergraduate	Graduate	Undergraduate	Graduate	
Fall 2014	378	6747	824	391	124	
Spring 2015	172	6132	835	492	110	
Summer 2015	56	2526	490	107	68	
Fall 2015	394	6385	839	406	136	
Spring 2016	223	6005	807	553	108	
Summer 2016	38	2635	513	120	66	
Fall 2016	409	6602	824	372	92	
Spring 2017	219	6035	811	623	97	
Summer 2017	38	2405	560	106	59	
Fall 2017	387	6814	852	455	106	
Spring 2018	241	6212	818	633	110	
Summer 2018	43	2632	554	112	39	
Fall 2018*	317	7007	977	491	121	

*Estimated count.

The well-being of an institution is measured using its growth, reflected by the enrollment, persistence, retention, and graduation. They are quite evident from Table 1, Table 2 and Table 3, as they appear to be prominent to conclude that institution's mission is fulfilled in the context of its purpose, characteristics, and expectations. Table 2, Table 3 provide both persistence and graduation rates for the available years until Fall 2018. Retention rates represent the percentage of a school's first-time, first-year undergraduate students who continue at that school the next year, from Fall to Fall is preferred, and four-year graduation rates encompass the percentage of students who completed a bachelor's degree within four years at TAMIU for each year from Fall 2010 to Fall 2017.

American Journal of Education and Learning, 2019, 4(2): 325-338

Cohort Semester	Cohort Count	#Returning Spring	%Ret Spring	#Returning 2nd Fall	%Ret 2nd Fall	#Returning 3rd Fall	%Ret 3rd Fall	Returning 4th Fall	%Ret 4th Fall
Fall 2013	936	857	91.56	709	75.75	569	60.79	492	52.56
Fall 2014	970	871	89.79	740	76.29	585	60.31	508	52.37
Fall 2015	963	895	92.94	745	77.36	616	63.97	538	55.87
Fall 2016	1096	1012	92.34	836	76.28	674	61.50	0	.00
Fall 2017	1194	1072	89.78	922	77.22	0	.00	0	.00

Table-2. Persistence rates - degree seeking full-time first-time in college cohorts (TAMUS, 2019).

Source: TAMUS (2019).

American Journal of Education and Learning, 2019, 4(2): 325-338

Cohort Semester	Cohort Count	%Grad - 4 Years	%Grad - 5 Years	%Grad - 6 Years
Fall 2010	953	17.10	34.52	41.34
Fall 2011	834	21.70	37.77	43.88
Fall 2012	933	23.04	39.66	45.87
Fall 2013	936	25.85	41.88	.00
Fall 2014	970	24.95	.00	.00

Table-3.	Graduation rates	- degree s	seeking full-time	e first-time in	college cohorts	(TAMUS, 2019)).
----------	------------------	------------	-------------------	-----------------	-----------------	---------------	----

Source: TAMUS (2019).

Two vital components of Building Scholars activities are the summer research week (SRW) and the faculty development workshops (FDW). Faculty from TAMIU and LC will collaborate in providing the SRW to 24 undergraduates from both institutions that includes training in the Responsible Conduct of Research, building basic writing skills and exposing students to science laboratories and research in non-science fields such as language, literature, art, education and criminal justice. The attendance has been now increased to 36 undergraduates to reap the benefits of this component. This bridge program will strengthen student's desire to engage in academically sensitive coursework, thereby succeeding in their courses and, in turn, in the program of study. SRW is a week-long program consisting of 10 discipline-specific modules delivered to the participants. The 10 modules consist of: 1) Research and the Scientific Methods, 2) Introduction to Nanotechnology for Renewable Green Energy, 3) Introduction to Statistical Analysis, 4) Writing and the Peer Review Process, 5) Introduction to the Psychology of Language and Bilingualism, 6) Research Safety, Ethics and Compliance, 7) Introduction to GPS, Mapping and Map-Making, 8) Cops, Courts and Intelligence Interrogations, 9) Molecular Research Tools, and 10) Introduction to Forensic Chemistry. The modules are delivered by selected faculty with expertise in the specific areas of research. The modules are conducted at an interval of two modules a day: morning modules from 9:00 am to 12:00 pm and afternoon modules from 1:00 pm to 4:00 pm. The participants complete 30 hours of lecture and activities to expand their research potential and to experience the discipline-specific research topics unique to their program of study with the guidance of a faculty leader (Undergraduate Research Coordinator). An anonymous feedback survey consisting of ranking questions (1, being the lowest, to 5, being the highest) and open-ended questions is administered at the end of the week in order to help improve and better serve students in the future. The SRW has served 110 students since 2015. Figure 9 illustrates the answers for two of the questions of the survey regarding the participants' plans to perform undergraduate research before and after the workshop in which 4 and 5 rankings dramatically increased from 43.92%, less than half of the participants, to 86.92%.

	Your plans for continuing to perform	23.36%	
2A	research as part of your degree before this workshop.	20.56% 31.78%	Ranking
	Your plans for continuing to perform	13.08%	3
2B	research as part of your degree after this workshop.	57.01%	5

Figure-9. Participants' plans to perform research before and after the SRW.

Source: Building scholras.

The FDW component of Building Scholars is a very popular one. It strengthens academic programs through faculty development activities focusing on academic rigor, improving teaching and learning, and undergraduate student research. FDW is a single day of activities that are delivered by an expert who has been identified by the program personnel each semester of the year. He or she is made available for the faculty and students before and after each workshop for possible consultations and collaborations. In addition, there are 50 minutes of presentation for the audience consisting of faculty, students, and staff followed by a 20 minute break and a Q&A session that lasts for about 45 minutes. Faculty and students are encouraged to maintain contact with this expert after the conclusion of this workshop. A post-workshop feedback survey, voluntary and anonymous, consisting of ranking questions (1, being the lowest, to 5, being the highest) and open-ended questions is administered. The FDW has served 399 faculty, students, and staff members. Figure 10 illustrates the answers for two of the questions of the survey regarding the participants' understanding of undergraduate research before and after the workshop in which 4 and 5 rankings increased from 77.16% to 91%.

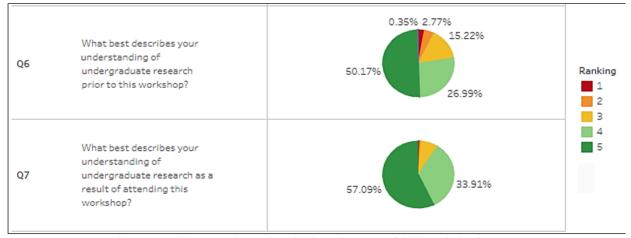


Figure-10. Participants' understanding of undergraduate research before and after the FDW.

Source: Building scholras.

Thus, hands-on experience, development opportunities, and mentorship will contribute to a more positive perspective towards academic activities, such as undergraduate research.

6. CONCLUSIONS

Building Scholars is meant to help increase the number of Hispanic and low-income students attaining postsecondary certifications, associate and bachelor's degrees. It prepares students for positions in graduate and professional schools, thus fostering the competency and diversity of the Laredo's workforce.

The success of the instructional programs such as this one is determined based on the increasing number of first-time, full-time, and degree-seeking students at the institution, the student retention and graduation rates, and the number of students seeking graduate and professional schools upon graduation.

Towards this, TAMIU recently announced that its 6-year graduation rate jumped from 45 to 55% over the last ten years. Four-year graduation rate also has increased during this period from 17.5 to 28% (TAMUS, 2019) concluding that programs similar to Building Scholars have had some effect on maintaining these ongoing accomplishments. TAMIU original QEP proposal has envisaged the majority of the components adopted in the Building Scholars and provided a budgetary sketch for their implementation. Institutionalization of the components would be looked once again, as part of QEP, as expected at the end of 2020 (with a possible one year no cost extension) based on overall successes of each one of them (Quality Enhancement Plan (QEP), 2015).

TAMIU has been ranked 16th in the 2019 U.S. News and World Report's Best Colleges report. TAMIU was the highest-ranked Texas public university in the Best Regional Universities West category at 59 of 127 West universities surveyed among 656 universities nationally. Last year, TAMIU ranked 70. Its online MBA was also one of the Best Online Master's Degrees in Business, ranking 82 out 284 reviewed (US News and World Report, 2019). TAMIU ranks No. 3 among the 10 best colleges for mathematics majors in the state of Texas, according to a new ranking announced by Zippia.com. TAMIU graduates continue to dominate the workforce in the Laredo and surrounding areas. Additionally, there was a 36% increase in graduate enrollment for the M.S. in Mathematics Degree tracks program at TAMIU in Spring 2019 compared to Fall 2018.

7. ACKNOWLEDGEMENTS

We thank the project personnel that has been part of Building Scholars in the past and facilitators of each part of the project components for their excellent support, which is valuable and greatly appreciated. We also thank Manuel Fernandez, Paola M. Segovia, and Vanessa L. Mireles, who were immensely involved in the initial draft of this paper and the corresponding survey management. The preliminary work of this project has been presented at TAMIU's 23rd Annual Western Hemispheric Trade Conference, April 4, 2019, the 4th coastal bend mathematics and statistics conference (CBMSC), March 23, 2019 at university of texas – rio grande valley (UTRGV), Edinburg, Texas, and Texas Hispanic Serving Institutions Consortium's Annual Conference, "Promises Realized - Providing Resources and Opportunities for Minorities in STEM Education", University of the Incarnate Word, San Antonio, Texas, March 23-24, 2019.

REFERENCES

- Bandura, A., L. Reese and N. Adams, 1982. Microanalysis of action and fear arousal as a function of differential levels of perceived self-efficacy. Journal of Personality and Social Psychology, 43(1): 5-21.Available at: https://doi.org/10.1037//0022-3514.43.1.5.
- Bassi, M., P. Steca, A. Delle Fave and G.V. Caprara, 2007. Academic self-efficacy beliefs and quality of experience in learning. Journal of Youth and Adolescence, 36(3): 301-312.Available at: https://doi.org/10.1007/s10964-006-9069-y.
- Boaler, J., M. Cordero and J. Dieckmann, 2019. Pursuing gender equity in mathematics competitions, a case of mathematical freedom, MAA focus. Mathematical Association of America, 39(1): 18-21.
- Brady, K.L. and R.M. Eisler, 1999. Sex and gender in the college classroom: A quantitative analysis of faculty-student interactions and perceptions. Journal of Educational Psychology, 91(1): 127.Available at: https://doi.org/10.1037//0022-0663.91.1.127.
- Braxton, J.M. and S.A. McClendon, 2001. The fostering of social integration and retention through institutional practice. Journal of College Student Retention: Research, Theory & Practice, 3(1): 57-71.Available at: https://doi.org/10.2190/rgxj-u08c-06vb-jk7d.
- Calcagno, J.C., 2007. Evaluating the impact of developmental education in community colleges: A quasi-experimental regression-discontinuity design. PhD Dissertation. Columbia University, Graduate School of Arts and Sciences, New York.
- Contreras, M.A. and P.D. Morales, 2019. Influence of beacon tracking on usages and performance in college Algebra courses with learning support. The 4th Coastal Bend Mathematics and Statistics Conference (CBMSC), Saturday, March 23, 2019.

- Feldman, K.A., 1988. Effective college teaching from the students' and faculty's view: Matched or mismatched priorities? Research in Higher Education, 28(4): 291-329.Available at: https://doi.org/10.1007/bf01006402.
- Glynn, S.M., L.P. Aultman and A.M. Owens, 2005. Motivation to learn in general education programs. The Journal of General Education, 54(2): 150-170. Available at: https://doi.org/10.1353/jge.2005.0021.
- Hurtado, S. and M. Kamimura, 2003. Latina/o retention in four-year institutions. In J. Castellanos & L. Jones (Eds.), the majority in the minority: Expanding the representation of Latina/o faculty, administrators and students in higher education. Sterling, VA: Stylus. pp: 139-150.
- Kealy, M.J. and M.L. Rockel, 1987. Student perceptions of college quality: The influence of college recruitment policies. The Journal of Higher Education, 58(6): 683-703.Available at: https://doi.org/10.1080/00221546.1987.11778293.
- Kuh, G.D. and S. Hu, 2001. The effects of student-faculty interaction in the 1990s. The Review of Higher Education, 24(3): 309-332.Available at: https://doi.org/10.1353/rhe.2001.0005.
- Lizzio, A., K. Wilson and R. Simons, 2002. University students' perceptions of the learning environment and academic outcomes: Implications for theory and practice. Studies in Higher Education, 27(1): 27-52. Available at: https://doi.org/10.1080/03075070120099359.
- Munsch, P., M.A. Miller, J.K.W. Borland, J. Gilgour, A. Duberstein and M. Warren, 2015. From remediation to graduation: Directions for research and policy practice in developmental education. Washington, DC: ACPA-College Student Educators International.
- Quality Enhancement Plan (QEP), 2015. ACT on IDEAs; applied critical thinking as expressed through undergraduate research, prepared for the commission on colleges of the Southern association of colleges and schools, On-site visit: March 17 – 19, 2015. Laredo, TX: Texas A&M International University.
- Ramsden, P., 1979. Student learning and perceptions of the academic environment. Higher Education, 8(4): 411-427. Available at: https://doi.org/10.1007/bf01680529.
- Rendón, L.I., A. Nora, J.M. Ray and J. Cabrales, 2018. Realizing the promise of success for Latinx STEM students- Latinx Students in STEM policy & practice brief. San Antonio, Texas: Center for Research and Policy in Education, the University of Texas at San Antonio. San Antonio, Texas.
- Rymer, K.R., 2017. Assessing self-efficacy to improve impoverished students' education. A Doctoral Dissertation, Education Department, Carson-Newman University.
- SACSCOC, 2019. Quality enhancement plan (QEP) the Southern association of colleges and schools commission on colleges. Available from www.sacscoc.org/QEPSummaries.asp.
- TAMIU, 2018. TAMIU'S innovative use of data and analytics earns campus labs award. Available from https://www.tamiu.edu/newsinfo/2018/12/tamiucampuslabs18award121218.shtml.
- TAMUS, 2019. EmpowerU slides for March 7, 2019 CASA meeting, from the Office of Academic Affairs, the Texas A&M University System.
- Tschannen-Moran, M. and M. Barr, 2004. Fostering student learning: The relationship of collective teacher efficacy and student achievement. Leadership and Policy in Schools, 3(3): 189-209.Available at: https://doi.org/10.1080/15700760490503706.
- US News and World Report, 2019. US News and World Report ranks TAMIU highly in 2019 best colleges, 2019. Available from https://t.co/RexxnxuuDP.

Online Science Publishing is not responsible or answerable for any loss, damage or liability, etc. caused in relation to/arising out of the use of the content. Any queries should be directed to the corresponding author of the article.