

**AN ASHE INSTITUTE REPORT
WITH PUERTO RICAN HIGHER EDUCATION LEADERS**

Working Beyond Borders to Cultivate Knowledge and Support for Puerto Rican Colleges and Universities

Edited by Vanessa A. Sansone and Monica Hernandez



PRESENTED BY



LAND ACKNOWLEDGMENT

Written by the ASHE 2021 Local & Community Engagement Committee for the Boriken Syllabus

We gather together to engage in knowledge sharing, discourse, and disruption with the land currently known as Puerto Rico. The set of islands (an archipelago that includes what is currently known as Puerto Rico, Vieques, Culebra, and other uninhabited islands), was called Boriken, meaning “land of the great lords,” by its original caretakers, the Taíno people. Shortly after the arrival of the Spanish the population of Taínos dramatically decreased through disease and the violence of enslavement, although there are accounts that many fled to the mountainous interior of the island. In order to advance their colonial project, the Spanish brought the first enslaved African people to work the mines and later sugar cane fields. In addition to Europeans, the influence of both the Taíno and West African cultures can be seen in the food, language, and music in present-day Puerto Rico.

As scholars of higher education, we commit to robustly interrogating the history of this place. This requires us to reflect on the tenuous and contested relationship with the United States, rooted in colonialism and empire, and its role in higher education. Likewise, we recognize that as visitors we must always be mindful of our relationships, connection, and responsibility to place. This requires us to engage with its history, honor its people, and to be in right relation with land, water, and all creation. We embrace the opportunity and responsibilities of learning with and being in community with the people and land of Puerto Rico.



**AN ASHE INSTITUTE WITH PUERTO RICAN
HIGHER EDUCATION LEADERS**

**Working Beyond Borders to Cultivate
Knowledge and Support for Puerto Rican
Colleges and Universities: Post-Traditional
Student Characteristics, STEM Outcomes,
and Financial Context in Puerto Rico**

**The project was led by
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November 2021

Presented by



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About the Association for the Study of Higher Education (ASHE)

ASHE is a scholarly society with 2,000 members dedicated to higher education as a field of study. It is committed to diversity in its programs and membership, and has enjoyed extraordinary success in involving graduate students in Association activities.

The Association for the Study of Higher Education (ASHE) promotes collaboration among its members and others engaged in the study of higher education through research, conferences, and publications, including its highly regarded journal, *The Review of Higher Education*. ASHE values rigorous scholarly approaches to the study of higher education and practical applications of systemic inquiry.

Through its peer-reviewed publications, annual conference sessions, presidential invited sessions, and other intellectual and professional fora, the Association for the Study of Higher Education promotes scholarly discourse and debate about important issues and ideas, questions, problems, and possibilities in the study of higher education. Learn more at www.ashe.ws.

About the ASHE Institute with Puerto Rican Higher Education Leaders

The ASHE 2021 Institute with Puerto Rican higher education leaders held in November 2021, was a day-long program with invited college and university leaders across the Puerto Rican higher education landscape (public/UPR, private, technical) that occurred prior to the 46th Annual Conference for the Association for the Study of Higher Education (ASHE).

In alignment with the theme of the 2021 ASHE Conference “Spanning and Unsettling the Borders of Higher Education,” the Institute encouraged Institute attendees to consider the multiple ways that higher education crosses both designated and imagined borders in practice, policy, and scholarship.

Authorship

The authors of each section contributed equally to the development of the work and have chosen to share first authorship, listed alphabetically.

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Dear Colleagues,

We are honored to write this opening letter for this incredible collection of knowledge, insights, and recommendations. The 2021 Institute with Puerto Rican Higher Education Leaders turned into something more than we could have imagined. While the Institute itself was a day-long program, the 18 Ascendium Fellows spent three months leading up to the event learning about Puerto Rican higher education and the various aspects of student success that were a part of this program.

The Institute, and this report, provided a unique opportunity for participants to further dismantle the boundaries of higher education practice, policy, and scholarship with a goal of understanding and specifically focusing on local realities and successful practices of a U.S. territory that is often excluded in our research and policies. It was imperative to this work that ASHE members would be learning from and with Puerto Rican leaders instead of approaching this work from a position of authority. The Institute, therefore, was the connection between the work of ASHE member scholars and the frontline knowledge and experiences of Puerto Rican leaders. Through this work, Ascendium Fellows leveraged their expertise to serve the most marginalized students in Puerto Rico and to recognize Puerto Rican postsecondary education as hubs of learning and professional training in ways that honor Puerto Rico's unique postsecondary education landscape and colonial positionality.

Throughout this report, you will find research and stories on adult learners, students in rural areas, and incarcerated students; on the successes of Puerto Rico's strong contributions to science, technology, engineering, and mathematics (STEM); and the financial supports needed to achieve and further develop student success goals.

We want to thank the Ascendium Education Group and especially Rebecca Villarreal for their support in allowing us to create the ASHE-Ascendium Fellows Program for this work. We'd also like to thank the Lumina Foundation and especially Jasmine Haywood as well as the University of Denver Morgridge College of Education for their additional support. We owe tremendous thanks to Margarita Benítez who helped us to understand histories and contexts of Puerto Rican higher education—as well as who provided many fun stories along the way. We are also incredibly grateful to Vanessa A. Sansone who served as Project Chair and Monica Hernandez who served as Project Coordinator. Their work made this dream become a reality. To the 18 Ascendium Fellows, thank you for your expertise and the care you brought to this work. And finally, to the people of Puerto Rico, thank you for allowing us to learn with you and alongside you. We hope this report will showcase everything that makes Puerto Rican higher education special as well as ways in which scholars and leaders can continue to support you.

Sincerely,

D-L Stewart, PhD
ASHE 2021 President

Jason P. Guilbeau, PhD, CAE
ASHE Executive Director

Introduction

Association for the Study of Higher Education 2021 Institute with Puerto Rican Higher Education Leaders

Monica Hernandez and Vanessa A. Sansone

To span our knowledge about Puerto Rican higher education, the Association for the Study of Higher Education (ASHE) invited college and university leaders across the Puerto Rican higher education landscape to a day-long program. Taking place ahead of the 46th Annual Conference, the Institute engaged three teams of Ascendium Fellows and Puerto Rican higher education leaders to address various streams of student success and its intersections with institutional, commonwealth, and federal policy. Resulting from the Institute is this report that considers the context of Puerto Rico in relation to educational pathways for students and its significance to advancing postsecondary education in the United States. In this section, we broadly present Puerto Rico's higher education landscape. We do this to address upfront the broader, historical, economic, and social contexts that all authors of this report were asked to consider as they explored their research questions about Puerto Rican colleges and universities and the populations they serve. Throughout this report, we have chosen to use the term Hispanic instead of using such terms as Latinx/a/o or Latiné. Although we consciously discussed with Puerto Rican higher education leaders and considered previous research about Hispanic racial/ethnic identification (Salinas & Lozano, 2021), we chose to align our terminology in this report with U.S. federal reporting because of our intention towards working with our Puerto Rican colleagues to address higher education policy, particularly at the federal level.

In Puerto Rico, there are currently 89 colleges and universities, which we also refer to in this report as Boricua institutions of higher education (National Center for Education Statistics [NCES], 2020). Of these, 21 are in the for-profit sector (NCES, 2020). There are also 14 institutions designated as public 4-year, with 11 of these campuses making up the University of Puerto Rico System (UPR). The UPR System plays a significant role in public education, STEM degree attainment and graduate degree attainment of Puerto Rico (Brusi, 2011). But the majority of higher education institutions in Puerto Rico are private institutions, with a total of 48 classified as private non-profit 4-year universities and 2 designated as 2-year private non-profit colleges (NCES, 2020). These 50 private colleges and universities are also found to be more accessible and more affordable, despite being private, and therefore are serving a larger share of Puerto Rican students, especially when compared to public institutions (Labandera et al., 2021). There are also a total of 14 community colleges, with only 4 of these campuses classified as a public 2-year. And because of Puerto Rico's demographic realities, having a 98% Hispanic population (U.S. Census Bureau, 2021), 90% of Puerto Rico's institutions are federally classified as Hispanic-

Serving Institutions (HSIs) (*Excelencia* in Education, 2019). Despite the number of established higher education institutions, Puerto Rican people and the colleges they attend remain overlooked and in many cases underserved (Brusi & Godreau, 2019). This is concerning because recent data shows a pattern where student enrollment is decreasing in Puerto Rico, particularly at private colleges that tend to serve a greater proportion of Puerto Rican people overall (*Excelencia* in Education, 2019). At the same time, data on Puerto Rican higher education shows degree attainment has increased, especially at private and for-profit institutions (*Excelencia* in Education, 2019). Leaving some to wonder what is going on.

Recently, Puerto Rico has faced several natural disasters (e.g., Category 5 Hurricanes Irma and María, September 2017) and seen significant shifts to their higher education funding structures. For example, Hurricane María, not only caused mass destruction and death, but also left the island with \$90 billion in damages (Acevedo, 2021). In the aftermath of Hurricanes Irma and María, there has been a lack of federal response, which has limited the recovery efforts of Puerto Rico and its higher education infrastructure (Brusi et al., 2018). The lack of federal assistance has made Puerto Ricans' access to and completion of higher education a much more complicated process (Rodriguez et al., 2021). It is also likely that Puerto Ricans and the colleges that serve them, have had to contend with drastic interruptions in basic services, like electricity and potable water (Nelson et. al, 2020). Also with the enactment of 2016's Puerto Rico Oversight, Management, and Economic Stability Act (PROMESA), public Puerto Rican colleges and universities saw severe cuts to their operating budgets. These austerity measures by the Puerto Rican government have forced public higher education to operate in severe budgetary constraints and place more college costs on the shoulders of students (Brusi, 2021; *Excelencia* in Education, 2019). Today, the UPR continues to operate in the aftermath of natural disasters and a global pandemic, while also managing an on-going debt crisis.

In examining Puerto Rican higher education, it is also important to recognize the racialization of the Puerto Rican people living within the U.S./Caribbean context. Understanding the influence of the United States' racialization of Puerto Rican students is crucial in contextualizing racial and socio-economic inequalities, as well as necessary to properly address the needs of students in Puerto Rico, and the institutions that serve them (Franco Ortiz et al., 2004). Brusi (2021) noted that the intersection of "race and class or socioeconomic status, lighter-skinned Puerto Ricans are overrepresented in the highest income brackets, with Black students and Afro-Puerto Rican families disproportionately affected" (p. 9). Therefore, Puerto Rican students, while often identified as Hispanic, are not monolithic people and have intersectional identities related to their histories and positions of power in Puerto Rico and the U.S. (Núñez, 2014). In line with Puerto Rican identity recognitions, Puerto Ricans have extensive linguistic capital, speaking in English and Spanish, but read, write and speak Spanish as their first language, including at the postsecondary level (López Laguerre, 1989; Torres-Gonzalez, 2002).

A goal of this report is to provide research that advances the field of higher education's understanding of Puerto Rican higher education. Guided by Puerto Rican higher education leaders, the authors of this report focused their efforts on three areas of research: post-traditional student characteristics; Science, Technology, Engineering, and Mathematics (STEM) outcomes; and financial context in Puerto Rico. Currently, there is some research that focuses on Puerto Rican higher education (e.g., Brusi, 2021; Brusi & Godreau, 2019; Núñez & Elizondo, 2012), but we still do not know enough about Puerto Rican colleges and universities, its students, and how to best serve them. There is also a need to learn more about the assets and uniqueness of Puerto Rican higher education, given that most research on U.S. higher education often excludes discussions about Puerto Rico and/or conflates their experiences with all Hispanics and/or all HSIs. Thus, the authors in this report aim to address these gaps in understandings about Puerto Rican higher education. In doing so, the authors recognized their limitations as people who do not live in Puerto Rico. To address this limitation, this report took a collective research approach. The authors traveled to Puerto Rico to work with members of the Puerto Rican higher education community to gain deeper understandings about Puerto Rico, Puerto Rican students, and Puerto Rican colleges and universities. In what follows, is an edited report about what was found. Each section examines what is known, discusses where gaps in the literature remain, and offers recommendations for policy and practice. The last section ends with a brief discussion about what we learned, and addresses how the ASHE community of researchers, policymakers, and practitioners can build off this work to *span the borders of research*.

Institutionalizing Educational Opportunities to Foster Higher Education Access, Persistence, and Completion for Post-Traditional Students in Puerto Rico

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HIGHER EDUCATION CONTEXT IN PUERTO RICO

Puerto Rico has 89 higher education institutions, with about one-third being in the private for-profit sector and/or only offering certificates (NCES, 2020). The public sector represents about 13% of all institutions (Dika, 2014). Over the last couple of decades, enrollment in public institutions has decreased and enrollment in private for-profit institutions has nearly tripled (Cámara Fuertes, 2007). As such, private institutions enroll the majority of undergraduate students but their graduation rates are almost half of public institutions: 24% at for-profit institutions; 22% at private non-profit institutions, and 41% at public institutions (Cámara Fuertes, 2007; Labandera, et al., 2019).

While various points in time, such as student protests, emphasize the importance of higher education for Puerto Rican communities (Lebrón, 2019), the privatization of education remains a barrier in diversifying the higher education student body (Brusi, 2011). Higher education is particularly important for economic mobility in Puerto Rico (Lebron, 2019; Reynoso-Vázquez 2019), as the median family income is 2.7 times greater when comparing individuals with a bachelor's degree versus a high school degree (Díaz, 2010). Also, when compared to the rest of the United States, Puerto Rico is the poorest territory with more than half of its population living below the poverty line (Labandera et al., 2021). As such, this report centers the institutionalized educational opportunities available to post-traditional students with the aim to foster access to, persistence in, and completion of higher education degrees in Puerto Rico. In this report, we address two key questions: What is known about access to and persistence and completion within Puerto Rican higher education for post-traditional students in Puerto Rico? And, how, if at all, do Puerto Rican higher education institutions foster college access, persistence, and completion

for post-traditional students in Puerto Rico? This report highlights the important work that Puerto Rican organizations, communities, and scholars have been conducting to address such issues and bridge equity gaps, while offering new ways to continue movement in the areas of research, practice, and policy.

DEFINING POST-TRADITIONAL STUDENTS

We were charged with focusing on the post-secondary pathways of post-traditional students defined as adult learners, currently/ previously incarcerated individuals, and rural students. In considering the Puerto Rico context specifically, we chose to build on the three groups by defining post-traditional students as individuals who have not traditionally had access to higher education institutions. In particular, we consider socioeconomic status to include individuals who live below the poverty level, racialization and immigration status to include Black students, Indigenous students, Black undocumented students, and Dominican and Haitian immigrant students. We also include: women/women-identifying students who live below the poverty level and man/man-identifying students. Our rationale for defining post-traditional students by including traditionally under-served student groups begins by building on the U.S.-centric framing of the post-traditional student profile as a starting point. The Puerto Rico context, and its higher education system shows that students in Puerto Rico meet this profile with distinct nuances (see Table 1.1 next page).

The U.S. framing of the post-traditional student profile includes students who are low-income in Puerto Rico. We reframe this group to focus on students who live below the poverty line because “over 60% of the students at the UPR (are) eligible for Pell grants” (Brusi, 2021, p. 3). With a median household income of \$20,474 and almost half of the population living

below the poverty level in Puerto Rico, this has significant implications for college accessibility and affordability (Brusi, 2021; Labandera, Santiago, & Laurel, 2021). Moreover, U.S. Census data highlights the concern of equitable access to higher education because students who are 18-22 years old and enrolled in college are more likely to come from economically advantaged homes (Díaz, 2010).

The post-traditional student also includes the experiences of incarcerated and formerly incarcerated students as this population is often living below the poverty line with limited access to higher education. Rodríguez-Díaz et al. (2011) found that more than 16,000 individuals are incarcerated in Puerto Rico annually. Punitive measures in Puerto Rico date back to the 1940s from the implementation of the *La Ley de la*

Mordaza (LeBrón, 2017). During the 1990s, governmental policies targeted low-income communities in Puerto Rico, known as *Mano Dura* (iron fist) (LeBrón, 2019, 2017). These policies led to overcriminalization of low-income communities and People of Color in Puerto Rico.

We include race as a significant component of the post-traditional student profile in Puerto Rico. U.S. Census data for Puerto Rico shows that only 8% of the population identified as Black and over 80% of the population identified as white in 2000. However, in order to properly address the needs of post-traditional students, we must be aware of the United States' influence on the racialization of Puerto Ricans on the island (Franco Ortiz & Ortiz Torres, 2004). By 2010, 12% of the population in Puerto Rico identified as Black, and community

Table 1.1: Defining the Post-traditional Student

| | |
|---|--|
| <p>U.S. State-Centric</p> | <ul style="list-style-type: none"> • Low-income/Pell-eligible • Enroll in community college and part-time • Live off-campus with parents or their own dependents • Adult Learners • First-in-family to enroll in college • Hispanic or Black/African American • Work while enrolled |
| <p>Puerto Rico Centric <i>(Meets the U.S. State-Centric profile with added nuance)</i></p> | <ul style="list-style-type: none"> • Live below the poverty level • Rural students • Incarcerated/formerly incarcerated students • Adult learners • Black and/or Indigenous students • Black undocumented students • Dominican and Haitian immigrant students • Female/Female-identifying students that live below the poverty level • Male/male-identifying students |

organizers continued to work toward a more accurate representation of Afro-Puerto Rican experiences and realities on the island (Colectivo Ilé, 2021). The work being conducted by community organizers is particularly important to the context of racialization in Puerto Rico because in 1950 Governor Muñoz Marín eliminated the race category from the U.S. Census and other official records (Godreau, 2002). Space and place are central to understanding the racialization of students as it pertains to the production of racial structures and socio-economic inequalities in Puerto Rico. Through the intersection of “race and class or socioeconomic status, lighter-skinned Puerto Ricans are overrepresented in the highest income brackets, with Black students and Afro-Puerto Rican families disproportionately affected” (Brusi, 2021, p. 9). In addition, slavery was abolished March 22, 1873 but enslaved individuals were not emancipated, which had a significant impact on generational wealth for AfroBoricuas.

In tandem with our understanding of racialization of students, immigration also factors into the profile of post-traditional students in Puerto Rico. The majority of undocumented immigrants in Puerto Rico are Dominicans (Sawyer & Paschel, 2007) and Haitian (Duany, 2006). In Puerto Rico they are often racialized, due to the dynamic of *blanqueamiento*, or whitening of a population, that exists in the Caribbean, often causing Black and/or darker-skinned migrants to be at the “bottom of socioeconomic hierarchies”

(Sawyer & Paschel, 2007, p. 303). Since the 1980s, due to political unrest, mostly lower-income and undocumented Dominicans have been immigrating to Puerto Rico (Duany, 2005). With about 75% of Dominican immigrants living in San Juan, Puerto Rico (Minority Rights Group International, n.d.), the city has the second-largest Dominican migrant population outside of the Dominican Republic and New York City (Duany, 2005). Most undocumented immigrants in Puerto Rico are Dominicans (Sawyer & Paschel, 2007) and of the approximate 100,000 immigrants from the Dominican Republic, about one-third are undocumented (Minority Rights Group International, n.d.).

Lastly, another racialized population that is important to address are BoricuaTaínos who are commonly erased, through teachings of extinction and a mass genocide in the fifteenth and sixteenth centuries (Feliciano-Santos, 2021). However, in 2010, 3,351 people in Puerto Rico identified as “Taíno alone”, and 9,399 people identified as “Taíno alone or in combination with other categories” (Feliciano-Santos, 2021). While there are federally recognized Tribal Colleges and Universities in the states, no such institutions exist within Puerto Rico. Therefore, we must elevate and highlight the experiences of Indigenous BoricuaTaíno students as an important population within Puerto Rico, particularly as we explore the context of higher education as a possible venue to address social mobility and economic inequalities within the island.

While there are federally recognized Tribal Colleges and Universities in the states, no such institutions exist within Puerto Rico. Therefore, we must elevate and highlight the experiences of Indigenous BoricuaTaíno students as an important population within Puerto Rico, particularly as we explore the context of higher education as a possible venue to address social mobility and economic inequalities within the island.

An added layer to the post-traditional student profile in Puerto Rico is the intersection of gender and gender identity with socioeconomic status, which highlights two key demographic groups that are not often considered: 1) man/man-identifying persons, due to the higher proportion of women/women-identifying persons to man/man-identifying persons in Puerto Rico (Rivas, 2008), and, 2) women/women-identifying people who live below the poverty line, which is the largest demographic group living in poverty in Puerto Rico (U.S. Census Bureau, 2019).

Rurality is also salient to the context of Puerto Rico when defining post-traditional students. The majority of students in Puerto Rico live off-campus with family as most colleges or universities do not offer on-campus housing, which is often a marker of post-traditional students in the context of the U.S. (Labandera et al., 2021). While modernization and urbanization have changed the social and geographic landscape of modern-day Puerto Rico by moving away from the small town agricultural industry (Ayala & Bergad, 2002), data show that almost one-half of the physical island is still considered rural (Martinuzzi et al., 2008), with over 340,000 people living there (U.S. Census Bureau, 2010).

Finally, traditional college students are considered to be between the ages of 18 and 24 (Rabourn et al., 2018). We build on Ordoñez Franco and colleagues (2020) to define adult learners as students over the age of 25 who return “to college after an extended leave from school” (p. 3). Adult learners have been characterized as having a delayed enrollment process after completing high school, enrolling in higher education part-time, working full-time, being financially independent from parents, and not earning the traditional high school diploma, and/or caring for dependents (Choy, 2002).

HIGHER EDUCATION EXPERIENCES OF POST-TRADITIONAL STUDENTS

The research examining the experiences of post-traditional student groups in Puerto Rico is limited. In examining the postsecondary experiences of individuals enrolled at a public university in Puerto Rico, researchers have found that once in college, if a student graduated from a public high school, their retention rates decreased significantly, particularly for men (Dika, 2014). Such findings highlight the difference in retention rates between men and women in Puerto Rico higher education. This finding highlights the need for higher education institutions to support men differently than current practices (Dika, 2012). On the other hand, for women, the study found that if they talked about their career plans frequently, it correlated with a higher GPA (Dika, 2012).

Furthermore, perceived quality of relations with faculty members was a statistically significant predictor of GPA for students at one Puerto Rican institution (Dika, 2012), which aligns with previous findings that focused on Hispanic students in the U.S. (Anaya & Cole, 2001; Kuh & Hu, 2001). Brusi and Godreau (2021) elaborate on the potential quality of relationships between faculty and students. For instance, in 2017, students partnered with UPR faculty to organize a system-wide strike in protest of the austerity measures imposed by La Junta. Faculty supported the strikes by forming campus organizations opposing the austerity measures including massive budget cuts and higher tuition. Some faculty joined system-wide associations such as the Asociación Puertorriqueña de Profesores Universitarios (APPU), which supported passing a law developed by the Comisión Multisectoral de Reforma Universitaria (CMRU, Multisectoral Commission for University Reform), which aimed to protect the viability and solvency of the UPR system (Brusi & Godreau, 2021). Besides

the work of educational outreach, APPU passed a law protecting the viability and solvency of the UPR system. These reform efforts were taken up by “the Comisión Multisectoral de Reforma Universitaria (CMRU, Multisectoral Commission for University Reform), a group composed of between 30 and 50 representatives elected by the student, teaching, nonteaching, and community sectors charged with drafting a new law for the UPR” (Brusi et al., 2021, p. 16). Brusi and Godreau (2021) note that “[t]he proposed law (now being considered by the Senate under bill PS #172) seeks to protect the UPR from political intervention, provide a more democratic governance structure, and strengthen the institution’s fiscal capacity to fulfill its public mission” (Ibid). The unjust defunding of public higher education in Puerto Rico continued into 2021, with the senate considering Law 53, which would result in more budget cuts and campus closures. Thus, 2021 concluded with continued protests, displaced students and faculty, and campuses on strike. Clearly, the potential for quality of relationships between students and faculty in Puerto Rico goes deeper than simply checking off an advising task.

Adult Learners

Research on adult learners in Puerto Rico focuses on English learning, not post-secondary enrollment (Sambolin Morales & Carroll, 2015). Higher education institutional leaders developed policies and practices that tended to focus on the traditional age college student (Rabourn et al., 2018). In considering the context of Puerto Rico, it is possible to assume that the postsecondary educational pathways of students have been interrupted by various catastrophes partly attributed to climate change and exacerbated by inadequate U.S. responses, such as with Hurricanes Irma and María, earthquakes, and the COVID-19 pandemic. While some high school students transferred from Puerto

Rico to Florida schools post-Hurricanes Irma and María (Rodriguez et al., 2021), students who did not have the resources to migrate to the U.S. likely had their education interrupted even more drastically after a loss of electricity and potable water (Walters, 2019). Therefore we consider under-served post-traditional adult learners to be of particular importance when considering how to increase access to higher education.

Rural Students

Little research exists about who is actually serving and supporting rural students in Puerto Rico. The University of Puerto Rico-Utuado and the University of Puerto Rico-Cayey, both public universities, are the only Puerto Rican institutions documented by scholars as being in rural areas and serving rural students (Brusi & Godreau, 2021; United States Department of Education, 2019). Additionally, it can be assumed that, as Puerto Rico’s land and sea grant institution which educates students in fields of agriculture and marine sciences (Brusi & Godreau, 2021), University of Puerto Rico-Mayaguez educates some students from rural areas. However, most Puerto Rican institutions are not listed as being located in a rural area and/or do not explicitly state their connections to or any support programs specifically for rural populations.

We found only two Puerto Rican universities that explicitly documented service to rural people in Puerto Rico (Brusi & Godreau, 2021; U.S. DOE, 2019). Despite the small number of institutions who documented their rural service, scholars have begun to acknowledge and discuss Puerto Rican higher education institutions that serve large rural populations or populations connected to agriculture (Brusi & Godreau, 2021). However, this represents only the potential of such research related to Puerto Rico that could be conducted around higher education proximity to rural areas and institutional location. For instance, McClure et al.’s (2021)

research around regional, rural-serving institutions demonstrated which institutions in the states serve high populations of rural students and how to better resource and fund such colleges and universities. Yet, this research leaves out Puerto Rico. Further research should utilize data about Puerto Rico to determine which universities on the island are serving rural communities and people, as well as discuss those institutions' importance to rural Puerto Rican spaces.

Incarcerated and Formerly Incarcerated Students

We found a dearth in existing research about incarcerated and formerly incarcerated students in Puerto Rico. The Metropolitan Detention Center (MDC) Guaynabo (Department of Justice, 2011) is a pivotal site to increase access to higher education for currently and previously incarcerated individuals. MDC Guaynabo does offer various education opportunities such as literacy, General Education Development (GED), and English-as-a-Second Language. In addition, incarcerated individuals serve as instructors of Adult Continuing Education (ACE) courses, which include a focus on business and advanced math. However, the high school diploma and postsecondary education programs are available to students through a fee. According to the Gobierno de Puerto Rico Departamento de Correccion y Rehabilitacion (Gobierno de Puerto Rico, n.d.), there are courses available to incarcerated students who are in minimum custody facilities, however the courses offered are in welding and electricity. There are additional occupational and technical programs that are available and focused on topics such as: horticulture, computer system, hairstyling, baking, and cabinetmaking.

Black, Indigenous, and Undocumented Students

While there are no studies explicitly focused on undocumented students in Puerto Rico, previous research established that in the U.S., undocumented Hispanic students face an environment with increased deportation efforts (Kanstroom, 2007), state laws preventing undocumented students from enrolling in college and accessing financial aid (Suarez-Orozco et al., 2015), and anti-immigrant public sentiments (Zayas and Cook Heffron, 2016). The hostile environments in the U.S. experienced by undocumented students increase their stress and anxiety levels, which in turn hinder academic success (Gonzales et al., 2013; Muñoz and Maldonado 2012; Perez, 2010). In addition, undocumented high school students experience particular obstacles related to working and a sense of rejection because of their undocumented status (Perez et al., 2009).

In the U.S., undocumented students' narratives are racialized as Latino or Mexican and in Puerto Rico there is an othering and racialization of Dominican and Haitians as the undocumented (Duany, 2005; Sawyer & Paschel, 2007). This distinction is important in a context where the majority of the population is non-white European, there are material injustices and implications to individuals who are racialized as Black. This particular nuance is important to understand the role of colorism and skin-tone in financial stability, access, and how it is further compounded for Dominican and Haitian students. Furthermore, despite continuing discourse that erases indigeneity and perpetuates the extinction of the Taínos in Puerto Rico, scholars are bridging some of these gaps through their work with Taíno/Boricua activists and their reclaiming of this ethnic category and identity (Feliciano-Santos, 2021).

SPANNING THE BORDERS OF EXISTING RESEARCH

In this report, we emphasized the need to ensure that the higher education system of Puerto Rico engages in institutional changes that provide access to postsecondary pathways, develop a college culture that fosters a sense of belonging, and provides resources for post-traditional students to earn a postsecondary degree. Below we provide key recommendations to increase access to data, develop supportive programs, and foster a sense of belonging for students.

Recommendation #1: Public Access to Data

First, we recommend that university leadership work with the Puerto Rican Higher Education Council (El Consejo de Educación Superior de Puerto Rico, CESPR) to improve access to publicly available data disaggregated by race, income level, immigration status, and other background characteristics. This is particularly important given the decades of research that highlights the need for disaggregated data so as to better understand the areas for growth and strengths in terms of equitable outcomes (Harris & Bensimon, 2007). Public databases and sources such as the U.S. Census and the Integrated Postsecondary Education Data System (IPEDS) include racial and ethnic categories that are insufficient to fully capture the racial diversity and identity of the people of Puerto Rico. Thus, Colectivo

Ilé, a community-based organization launched a campaign in 2020 “*En el Censo dónde me pongo?*” (In the Census, where do I go?) to contest *blanqueamiento* and reaffirm the Black/Afro-Indigenous/Afro-Latinx identity of the Puerto Rican people (2021). Colectivo Ilé recommends inclusion of racial and ethnic categories on the U.S. Census like: *Negra, Mezcla de tres razas, Trigueña, Otra raza* (2021). We encourage campus offices of institutional research in Puerto Rico to assess how the university can expand the categories for various racial and ethnic groups, and for those that intersect, within public surveys and databases. Such measures are key to bridging the gaps found in the research to study the racialized implications of underrepresentation and erasure.

Survey data that documents the experiences of students in postsecondary institutions is essential to improving completion rates for post-traditional students. More specifically, participation in the National Survey of Student Engagement (NSSE) would provide key insights about the student experiences. Participating in such a survey allows educational leaders and researchers to better understand the experiences of all students and can help improve both the institutional support systems and approaches to improve the sense of belonging for students. Finally, such datasets can also highlight forms of success that are better aligned with the Hispanic student experience (Garcia, 2021).

In this report, we emphasized the need to ensure that the higher education system of Puerto Rico engages in institutional changes that provide access to postsecondary pathways, develop a college culture that fosters a sense of belonging, and provides resources for post-traditional students to earn a postsecondary degree.

Recommendation #2: Increase College Access and Persistence Programs for Post-Traditional Students

In terms of programs to increase college access, persistence, and completion rates for post-traditional students in Puerto Rico, we recommend that educational leaders collaborate with and build on the success of Federal TRIO programs (Programas de Oportunidades Educativas). These programs foster educational opportunities for individuals from low-income or disadvantaged backgrounds and first-generation college students and participants range from middle school to adult learners and postsecondary students (Caribbean Association of Educational Opportunity Programs, 2019). Similar programs should be developed alongside various low-income communities that are both local and distant from college campuses. Such programs present an opportunity for higher education leaders to bridge the “incredible inaccessibility” of public postsecondary institutions (Lebrón, 2019, p. 159). Programs such as Upward Bound or Educational Talent Search can facilitate access to higher education for K-12 students and Educational Opportunity Centers support adult-learners to access information about postsecondary pathways.

An organization that we encourage educational leaders to work with is ColaborativoPR, which is an intensive community-based organization that supports high school students in Loiza, an impoverished community on the northeastern coast—the center of Puerto Rico’s Afro-Latino community. ColaborativoPR was established by six foundations, along with a suite of community partners, to motivate and support Loiza’s high school students to complete high school and pursue postsecondary education. ColaborativoPR partners with Centro Esperanza Counselors to take students on college visits and help them fill out financial aid forms, whatever is needed. More than half of Loiza’s youth live below the poverty

level, and almost half of 18- to 20-year-olds are not in school. As demonstrated by the nearly 100 students present at ColaborativoPR after Hurricanes Irma and María, when students were unaccounted for and not attending schools, the impact of ColaborativoPR is clear.

ColaborativoPR has identified both key obstacles that students encounter when pursuing college admission and the high schools with the lowest percentage of students that attend college. As a result, ColaborativoPR partnered to provide remedial math and science education, mental health support, and college and career guidance. Students credit this support system with being able to access higher education and navigate the college admission process (ColaborativoPR, 2021). The individualized support, sharing of information, and encouragement provided by ColaborativoPR influences students to establish and pursue high aspirations, such as attending the University of Puerto Rico (ColaborativoPR, 2021). This is an important site and organization to fund and build on previous successes.

We did not find existing programs free of cost that fostered postsecondary educational opportunities for previously incarcerated individuals, but there are opportunities to apply for federal programs, such as the Second Chance Pell Experiment under the Experimental Sites Initiative (ESI). The program aims for higher education institutions to “propose to include programs focused on preparing students for employment in a sector or occupation that currently has or is projected to have a number of open positions locally or nationally...[and] programs that would allow students to continue their training or academic program upon release, including on the campus of the institution” (Federal Student Aid, 2021, para. 8).

In addition, we recommend that higher education institutions develop pilot programs, such as those that have

been successful in supporting formerly incarcerated students. As such, we recommend that higher education leaders look toward “Restoring Our Communities” at Laney College in California as an example of public two-year college faculty and staff developing such a program. Other examples exist to adapt as models in the California Community College system, Project Rebound at the California State University System, or Project Rebound at the University of California system. While they have developed over time, the programs were established with intentional efforts, collaborative leadership, and proper funding.

RECOMMENDATIONS FOR FUTURE RESEARCH

In alignment with previous research (Dika, Brusi-Gil de Lamadrid, & Díaz, 2010) we recommend that the Puerto Rico government continue to fund research that helps determine how to best support access and completion. While U.S. based research focuses on college access, college choice, and sense of belonging for Hispanic students (Acevedo-Gil, 2017; Contreras & Contreras, 2015; Garcia, 2020; Hurtado & Carter, 1997), more research is needed that focuses specifically on post-traditional students in Puerto Rico. Below, we provide a brief discussion on future research for adult learners, currently/previously incarcerated individuals, and rural students with particular focus on Black students, Indigenous students, Black undocumented students, Dominican and Haitian immigrant students.

Recommendation #3: Rural students

Given that so few institutions are classified as being in rural regions, it will be key to determine the distance rural Puerto Rican students must travel just to attend college on the island. However, most data utilized in previous research is around 10+ years old and is not representative of exact rural higher

education proximity (Hillman & Weichman, 2016). The authors of this report have started to analyze spatially related factors, such as transportation access and poverty levels. Thus, it is imperative for scholars and policymakers to acquire updated data to highlight Puerto Rican rural areas and show those communities’ proximity to postsecondary institutions in Puerto Rico.

While scholars have been working to fill the gaps related to rural students in the states (Ardoin, 2018; Ardoin & McNamee, 2021; Chambers, 2020), research needs to be conducted on these topics related to the experiences of rural, poor, and working-class people in Puerto Rico. This line of thinking has been contextualized in the states by scholars who have explored how higher education fosters barriers to access and success for those who are from rural areas and also identify as being Black (Means et al., 2016; Means, 2019) or Indigenous (Goldman, 2019; Irvin et al., 2016). Therefore, future research should examine how rurality and Black and Indigenous identities intersect specifically for Puerto Rican students within Puerto Rican higher education systems and structures that may impede access and success due to such compounding identity. In the context of Puerto Rico, spatial analysis would be particularly helpful because of the larger populations of Black students living in poverty on the coast.

Recommendation #4: Incarcerated and formerly incarcerated students

There is limited research examining the experiences of previously incarcerated Hispanic students in college (Abeyta, 2020) and an even greater dearth of studies that focus on formerly incarcerated Puerto Ricans seeking to enroll in higher education leaving a gap of knowledge and the effectiveness of existing programs for incarcerated individuals. It is critical for practitioners and scholars to identify and examine the sense of belonging from educational programming available for incarcerated

and formerly incarcerated students. The educational programming available to this student population should shift beyond occupational and technical programs to include academic offerings at the associates, bachelors, masters, and doctoral levels. Once a pathway from prisons to college has been established in Puerto Rico, this would provide researchers with opportunities to fill in the gaps in literature for incarcerated and formerly incarcerated students. In addition to a lack of literature on incarcerated students, there appears to be a larger gap for formerly incarcerated students. Given the context of what we know about the incarcerated populations in Puerto Rico, future research should examine how Black and Indigenous communities were impacted by incarceration, how these limited courses available through the Gobierno de Puerto Rico Departamento de Correccion y Rehabilitacion have impacted recidivism in Puerto Rico.

Recommendation #5: Black, Indigenous, and undocumented students

Similar to previously incarcerated students in Puerto Rico, there are no studies focusing on the postsecondary experiences of undocumented Black Dominicans in Puerto Rico. Public data under-represent and underestimate the actual number of undocumented Dominicans in Puerto Rico (Sawyer & Paschel, 2007). While there is a general awareness of Haitian migration to the Dominican Republic and Puerto Rico, no official statistics exist to accurately portray the Haitian population within Puerto Rico's higher education institutions (Coto & Daniel, 2013; Sawyer & Paschel, 2007).

RECOMMENDATIONS FOR PRACTICE

A key recommendation we have is for faculty, staff, and education leaders to become familiar with developing a sense of belonging (Hurtado & Carter, 1997) for post-traditional students in Puerto Rico.

Developing a sense of belonging in higher education for post-traditional students includes engaging in academic and interpersonal validation (Rendon, 1994) and acknowledging that students have access to community cultural wealth (Yosso, 2005) as personal assets. Thus, we recommend that education leaders, staff, and faculty engage in professional development to ensure that they disrupt deficit practices and build toward asset-based and critically conscious perspectives. Considering that 40% of the K-12 student population in Puerto Rico requires special education services (National Center for Education Statistics, 2018, as cited in Brusi & Godreau, 2019), it is imperative that colleges and universities are prepared to meet the needs of students with appropriate testing options and services, particularly considering that a portion of post-traditional students can also require and benefit from such supports.

POLICY RECOMMENDATIONS

We recommend various policies based on the limited research available. First, we recommend a shift in faculty hiring policies to ensure a focus on hiring Puerto Rican, Black Puerto Rican, and BoricuaTaínos tenure-track faculty members who are prepared to recruit and mentor post-traditional students (Lebrón, 2019). Second, we recommend appropriate funding to provide access for rural students. This recommendation is because in the wake of financial concerns and actions taken post-hurricane Irma and María “smaller campuses were targeted for closure [that] largely serve low-income, place-bound students in poorer municipalities” (Brusi & Godreau, 2019, p. 242).” Third, we recommend an increase in funding and support of public non-profit colleges, while regulating and limiting reach of private for-profit colleges (Brusi & Godreau, 2019), in order to provide a more equitable educational context for post-traditional students. Finally, we recommend

that students have access to free internet, which represents an immediate improvement to support college access and completion for post-traditional students.

This report represents only a start by providing a brief overview of context, research, policies, and practices to consider when examining and improving the institutional support available to

foster college access and completion for post-traditional students. While not an easy feat, leaders must engage with community members, faculty, staff, and students to develop policies and practices that account for the urgently needed equitable improvements to college access and completion for post-traditional student populations.

Student Success & STEM

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PUERTO RICAN COLLEGES AND UNIVERSITIES AND STEM

Puerto Rican colleges and universities play a significant role in Hispanic higher education, in the landscape of Hispanic-Serving Institutions (HSIs), and in promoting postsecondary education access and attainment. HSIs are defined as 2-year and 4-year, non-profit institutions with a student body that is at least 25% Hispanic (U.S. Department of Education, n.d.). These 569 institutions collectively enroll 67% of all Hispanic students in postsecondary education in the United States (*Excelencia in Education*, 2021a). Given these enrollment numbers, they have been recognized as critical to increasing the number of Hispanic students who pursue and attain degrees in STEM fields (Gomez et al., 2018). For instance, HSIs have received attention and funding from the National Science Foundation under projects like the HSI Program specifically geared toward institutional capacity building for promoting Hispanic students in STEM fields (Marrongelle, 2021).

In this report, we discuss the history and strengths of postsecondary STEM education in Puerto Rico, the current research on STEM education in Puerto Rico higher education, and the gaps in the research that currently exist. We offer several suggestions for how Puerto Rican institutions may leverage existing programs to further their work in training students in STEM fields.

Contending with Different Histories of Higher Education

The origin of higher education institutions (HEIs) in the United States of America (U.S.) had a clear intention of serving a specific sector of the population: White men (Wilder, 2013). Centuries later, HEIs have struggled to keep up with the changing ethnic and racial diversity present in their campuses. Public higher education in Puerto Rico was formalized through the Second Morrill Act of 1892 which in the U.S. paved the way for

the foundation of Historically Black Colleges and Universities (HBCUs) (Lee, 1963). The University of Puerto Rico (UPR) was founded in 1903, five years after the U.S. invaded the archipelago.¹ The foundation of several campuses and systems that serve STEM students include UPR (1903), the Interamerican University (1912), the Ana G. Méndez University System (1941), the Pontifical Catholic University (1948), and Ponce Health Sciences (1977). Because of its condition as a commonwealth of the U.S., Boricua HEIs can be categorized under Hispanic-Serving Institutions (HSIs). One key element of HSIs in Puerto Rico is that most faculty, institutional agents, and students share ethnic identities and cultural history.

Furthermore, the development of some of these institutions was contested. At UPR for example, local faculty organized and fought to ensure that Puerto Rican culture was taught in the university (La Torre, 2005). This historical struggle for identity is still a part of UPR's mission: "Conservar, enriquecer y difundir los valores culturales del pueblo puertorriqueño y fortalecer la conciencia de su unidad en la común empresa de resolver democráticamente sus problemas" (UPR, 2017). The history and present circumstances of HEIs on the archipelago are distinct in some meaningful ways from that of the United States. This is important to consider with respect to preparing undergraduates who studied and trained in Puerto Rican institutions for the often distinct climate of reception (see Portes & Rumbaut, 2001) they typically experience in the States, perhaps even at many HSIs in the continental U.S. where most graduate students and faculty do not share their ethnicity, language, and culture (see Conchas, 2001).

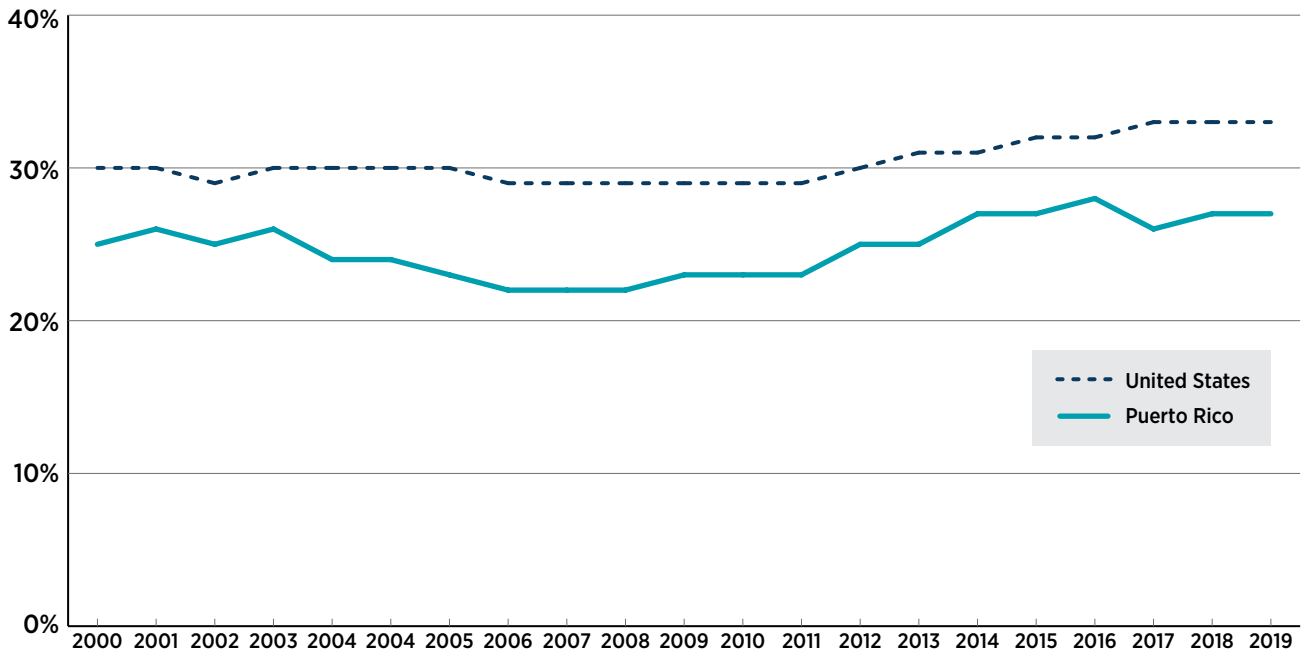
Retention and persistence factors regarding the STEM success of Puerto Rican

¹ While some refer to Puerto Rico as "an island," it is in fact an archipelago of 143 islands, including its eponymous island, Isla Mona to the west, and Vieques and Culebra to the east.

undergraduate students is a multilayered effort. Namely, there are factors on an individual student level, an institutional level, and an industry level that has sustained the development and resilience of STEM student preparation and success, even in the wake of macro-level challenges. For example, graduate training in health fields in Puerto Rico has increased since 2013, despite the economic and educational shocks posed by Hurricanes Irma and María (Rodriguez et al., 2021; Bonilla & LeBron, 2019). Turning to the financial costs associated with graduate training in science and engineering, it remains consistently less expensive in Puerto Rico

even as STEM research and development remains a considerably higher share of total Gross Domestic Product in the continental U.S. as compared to Puerto Rico (NSB, 2021). Notably, Puerto Rican adults aged 25-44 slightly outpace U.S. adult peers with respect to postsecondary degree attainment in recent years: 47.1% for Puerto Rico and 46.2% for the U.S. The percentage of Science and Engineering students going on to earn doctoral degrees is lower than in the U.S., especially in the period immediately following Hurricanes Irma and María, when many students moved their studies to stateside institutions. Still, the rates began climbing

Figure 2.1: Science and Engineering Degrees as a Percentage of Higher Education Degrees Conferred



Source. National Center for Education Statistics, Integrated Postsecondary Education Data System (various years), data available as of November 2020. Puerto Rico is represented in a solid green line, and a dotted black line represents the U.S. average.

Note. This indicator represents the extent to which a state's higher education degree awards are concentrated in S&E fields. S&E fields include the physical, life, earth, ocean, atmospheric, computer, and social sciences; mathematics; engineering; and psychology. They do not include medical fields or technologies. Counts of both S&E degrees and higher education degrees conferred include bachelor's, master's, and doctoral degrees; associate's degrees and professional degrees are not included.

again in 2018, after the potential to close the gap nearly occurred in 2016 as shown in Figure 2.1. We hypothesize that these efforts together positioned the Puerto Rican higher education system to consistently train and develop STEM undergraduates for STEM graduate programs and STEM workforce in and beyond Puerto Rico.

CURRENT RESEARCH ON PUERTO RICAN STUDENTS AND THEIR PURSUIT OF STEM SUCCESS

A notable student success factor in Puerto Rico higher education is one's connection with STEM faculty members. Dika (2012) found that students who achieved higher college grade point averages were strongly correlated to their faculty interactions. Specifically, Dika asserts that “student-faculty interaction bridging social capital—is an important element in predicting student achievement, independent of class rank, gender, or first-generation status for college students in Puerto Rico” (p. 608). Positive faculty interactions and strong mentoring relationships have been documented as an important factor contributing to Hispanic student success broadly (Alcocer & Martinez, 2018) as well as in STEM fields (Bensimon et al., 2019; Crisp et al., 2020).

Institutional Capacity for Creating Opportunities

On an institutional level, we find that Puerto Rican STEM academic programs employ several successful high-impact educational

practices to develop their students' science skills, identity, and self-efficacy from K-12 through college. One such high-impact practice is undergraduate research. Research suggests that undergraduate research provides students with in-depth training beyond the classroom, developing one's self-efficacy, identity, and competencies as a researcher and exposure to potential career pathways and graduate studies (Kuh, 2008; Pender et al., 2010; Russell et al., 2007). Notably, the Puerto Rico Louis Stokes Alliance For Minority Participation (PR-LSAMP) funded by the National Science Foundation (NSF) has been a long-standing collaboration with higher education institutions in Puerto Rico to engage minority and low-income students in STEM disciplines. Specifically, PR-LSAMP supports students in securing undergraduate research opportunities within Puerto Rico and across the world.

A similar example of postsecondary institutional collaborations to boost STEM participation is the CubeSat Project, a joint program between the University of Puerto Rico-Mayagüez and the Inter American University of Puerto Rico-Bayamon. This project promotes interdisciplinary research in the area of aerospace engineering and is a part of the NASA Space Grant Consortium in Puerto Rico (Darbali-Zamora et al., 2015). In addition to the research done in aerospace engineering, the collaborative effort also expanded the teaching methods and curriculum offered to students at these respective universities.

Notably, the Puerto Rico Louis Stokes Alliance For Minority Participation (PR-LSAMP) funded by the National Science Foundation (NSF) has been a long-standing collaboration with higher education institutions in Puerto Rico to engage minority and low-income students in STEM disciplines.

Gaps in the Extant Literature

Research on different types of HSIs have classified Puerto Rican institutions as their own category of HSIs (Núñez et al., 2016), and as of 2019-2020, HSIs in Puerto Rico constituted about 11% of all HSIs in the United States (*Excelencia in Education*, 2021a). One primary difference between Puerto Rican HSIs and other types of these institutions was the fact that nearly all the faculty and students in one study identified as Hispanic (at 95% and 99%, respectively; Núñez et al., 2016). Other differences have not been meaningfully explored in the HSI literature. For example, Garcia (2018) discussed decolonizing practices at HSIs, yet she explored these practices from a Mexican-focused perspective where colonization is a historical legacy, not a current reality. Núñez et al. (2016) noted several sociopolitical factors that defined Puerto Rican HSIs in their analysis including serving the highest percentage of Pell Grant recipients and being located in areas with high unemployment rates and comparatively low annual salaries. More research is needed to understand how socioeconomic status impacts students' ability to access postsecondary education in STEM fields and students' experiences.

While Puerto Ricans may ethnically identify as Hispanic or Latina/o/x; historically, Puerto Ricans living in the commonwealth have tended to identify racially as “white” if they identify with a specific group at all (Negrón-Muntaner, 2006; Rodriguez, 2001; Vargas-Ramos, 2014). However, Puerto Ricans are also racially diverse and increasingly identify with multiple demographic categories representing their heritage, including African and Indigenous ancestry as well as local terms that do not conform to typical federal race categories (Center for Puerto Rican Studies, 2021), signifying a greater openness to a fuller realization. In answering the question our group was charged with (“As HSIs, how might institutions leverage the story of the strong contribution of Puerto Rico higher

ed to mainland STEM graduate programs and the high degree attainment for Hispanic students?”), we collectively decided to focus on one element we believe plays a role in STEM student success in Puerto Rico and yet has been understudied: culturally relevant approaches to programming and teaching that mirror students' racial, ethnic, and cultural backgrounds. We acknowledge that these frameworks were not specifically developed in Puerto Rican contexts; however, we argue that they reflect the current strengths and cultivate a foundation for developing Puerto Rican-specific frameworks in the future.

Frameworks for Promoting Student Success in STEM

Museus (2014) presented the Culturally Engaging Campus Environment (CECE) model as a way to address the success of students that have been historically marginalized in HEIs. This model takes into account elements within two categories: cultural relevance and cultural responsiveness. In this model, students have the opportunity to engage with a campus community that understands their background, exchange knowledge about their cultural community, serve their communities, have their cultural knowledge valued, their campuses are characterized by collectivistic values, and institutional agents are committed to developing relationships with students (Museus, 2017). Not unlike many campuses across the U.S. (e.g., Posselt et al., 2012), Boricua HEIs tend to be ethnically homogeneous, although some campuses do have heterogeneous class and region representation.

The benefits of the CECE model in Hispanic students in the U.S. has been evaluated in several studies (Gonzalez et al., 2020; Santa-Ramirez, 2021; Shelton, 2019). The socio-political condition of Puerto Rico positions HEIs in a constant struggle to teach and value Western knowledges and culture. The success of STEM students from a cultural

As Puerto Rican undergraduate students in STEM progress through their academic journey, it is essential to factor in the strengths, talents, and experiences of cultural capital that these individuals bring to each learning and professional experience in which they engage.

approach presents to other institutions a key component to student success, educational spaces where Hispanic students are not minoritized or hindered by a system that does not honor and value their ethnic and cultural values.

As Puerto Rican undergraduate students in STEM progress through their academic journey, it is essential to factor in the strengths, talents, and experiences of cultural capital that these individuals bring to each learning and professional experience in which they engage. The Community Cultural Wealth model explains how students from racially marginalized backgrounds utilize various forms of cultural capital to navigate academic spaces. Yosso offers six forms of capital: Aspirational, Linguistic, Familial, Social, Navigational, and Resistance (Yosso, 2005). On an individual level, research suggests that students are employing various forms of cultural capital and garnering social agency to navigate their STEM undergraduate environments (Yosso, 2005). For example, students who live close to home utilize the proximity to their familial and social support networks to navigate their academic spaces. As such, undergraduate STEM students are undergirded early in their sense of belonging and science identity development.

EXPANDING THE BORDERS OF KNOWLEDGE FOR PUERTO RICAN INSTITUTIONS

Our collective efforts and a review of the literature offer some recommendations to

help expand the knowledge base around Puerto Rican colleges and universities and STEM education.

Recommendation #1: Need for Data Disaggregated by Race and Ethnicity

Results from the 2020 U.S. Census revealed that racial and ethnic identities in Puerto Rico are shifting (Center for Puerto Rican Studies, n.d.), so both quantitative and qualitative projects should account for these identities in nuanced, disaggregated ways. Further, we note that important work has been done on Puerto Rican students attending universities in the United States, but more research is needed in Puerto Rican higher education contexts. Qualitative work is well-suited to explain: a) how Puerto Rican HSIs may differ from those in the U.S. as well as other types of Minority-Serving Institutions and b) how institutional type (e.g., public, private, religiously affiliated, community colleges) also impacts students' experiences and outcomes. On the flip side, the disaggregation of Puerto Rican students would be helpful to researchers and institutions to add more nuance to research and evaluation projects that offer some generalizability.

Recommendation #2: More Research in Puerto Rican Contexts

Further, we note that important work has been done on Puerto Rican students attending universities in the U.S., but more research is needed in Puerto Rican higher education contexts. Qualitative work, for example, is well-suited to explain: a) how Puerto Rican HSIs may differ from those in

the U.S. as well as other types of Minority-Serving Institutions and b) how institutional type (e.g., public, private, religiously affiliated, community colleges) also impacts students' experiences and outcomes. *Excelencia* in Education (2021b) recently noted that graduation rates at private four-year institutions have risen while they have remained the same at public four-year institutions. More research is needed to explain what practices at private institutions have increased graduation rates and whether these rates include STEM fields. Relatedly, more research may take into account the context of the Caribbean and a more global perspective than what the extant research currently offers.

Recommendation #3: Invest in Culturally Relevant Programming

Advance culturally relevant approaches to pedagogy and co-curricular programming (e.g., advising, support programs, living-learning communities) to strengthen students' connection of their studies with ties to their identities (in addition to ethnic identity) and home communities. Through undergraduate research experiences, for example, that are completed close to a student's campus, they may be better able to see the potential for a STEM career in Puerto Rico. This may help Puerto Rico retain more students for post-graduate careers. Therefore, opportunities to create or improve pathways for undergraduate students from Boricua universities into STEM graduate

programs may benefit both Puerto Rican and other U.S. institutions through federal grant programs and mutually beneficial partnerships with STEM doctoral-granting institutions that have established institutional agents that support Puerto Rican STEM students (Bensimon et al., 2019).

Recommendation #4: More Support for STEM Faculty

Considering the direct benefit of research for students and faculty, we recommend continued support from government and university officials for faculty members pursuing external grant funding to develop research experiences. The Puerto Rico Science, Technology, and Research Trust serves as an essential grassroots mechanism to support seed funding for faculty-led research initiatives which can in turn support the training of current and future graduate students. Specifically, we suggest investing in writing support teams and recognition efforts to encourage external grant writing for larger and longer-term funding. This could also aid communication and collaborative synergies among faculty across and within institutions and STEM disciplines, fostering innovation and positioning for greater support from major foundations and government funders. Understanding that mentoring is a critical component to student success in STEM, we recommend that faculty receive training on best practices in mentoring. This type of training could, for example, be folded into faculty development activities in programs

Understanding that mentoring is a critical component to student success in STEM, we recommend that faculty receive training on best practices in mentoring. This type of training could, for example, be folded into faculty development activities in programs like the NSF ADVANCE grant awarded to specific develop female STEM faculty in Puerto Rico.

like the NSF ADVANCE grant awarded to specific develop female STEM faculty in Puerto Rico (Carter-Johnson et al., 2016). Similarly, it is important to establish or improve pathways for Puerto Rican STEM graduate students into postdoc, faculty, and industry positions within Puerto Rico via collaborations between Puerto Rican university researchers, other U.S. institution research partners, and Puerto Rican industries utilizing STEM talent (Colón, 2015).

Recommendation #5: Funding for Graduate and Bridging Programs

Federal funding for STEM graduate programs—and preparatory programs housed in undergraduate institutions—appears a critical resource for aspiring Puerto Rican graduate students. Indeed, students' career trajectories can be adversely affected by instability in federal financial aid dollars and support for training programs and fellowships (National Science Board, 2015, p. 26), many of which are housed at HSIs in Puerto Rico or at other stateside HSIs and other Minority-Serving Institutions. For example, increased funding and staffing support for PR-LSAMP and similar undergraduate student programs that promote high-impact practices. With

a direct mission to develop and support minority and low-income college students, PR-LSAMP and similar organizations serve as a valuable resource to assist in the holistic development of STEM undergraduate students as they prepare to enter graduate studies or the workforce post-graduation. Further, these organizations have the ability to have a broader reach to connect with students at their home institution and facilitate connections across L-SAMP chapters within the continental United States. In both the positioning of Puerto Rico-based STEM teams for external funding and the work institutions do to serve their students, it is essential to disaggregate student data and use locally-relevant categories to clearly communicate the intersectionalities of socioeconomic (dis)advantage and racialization. Such nuance may help communities within and beyond Puerto Rico understand the particular challenges STEM graduate programs and students face (as compared to stateside HSI institutions), as well as evidence for the strengths and effectiveness of efforts at Puerto Rican institutions to serve all of its students, across identities and communities.

Student Success & Funding

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CONTEXT

In Puerto Rico, the majority of colleges and universities are Hispanic-Serving Institutions (HSIs) with over 90% meeting the federal definition of an HSI. Puerto Rico has more colleges and universities than most states, ranking among the top 15 states/territories in the number of postsecondary institutions (89 colleges/universities). Of these institutions, the majority are four-year, private, not-for-profit institutions (48) relative to 13 four-year private, for-profit institutions and just 14 four-year public institutions. The two-year sector is small, comprising a total of only 14 institutions (8 for-profit, 2 private not-for-profit, 4 public). The University of Puerto Rico (UPR) system is the largest four-year public system with 11 campuses and it is recognized as the key mechanism for social mobility on the island. The UPR system, while selective, is generally considered more affordable compared to the private sector. In contrast, the private sector, although larger, is considered less selective and more expensive. Due to this unusual distribution of characteristics, the private institutions are considered less prestigious, are less competitive and are more prevalently attended by low-income students. (e.g., the InterAmerican University system serves populations of 80% or higher Pell-eligible students at each of their 9 campuses (www.inter.edu)). Therefore, the purpose of this report is to explore funding avenues utilized by Puerto Rican institutions of higher education (IHEs) and determine how application of equitable federal funding could improve student success in Puerto Rico. More specifically, we address the following research question:

What funding sources of support do Puerto Rican Colleges and Universities (PRCUs) need to achieve and further develop student success goals?

REVIEW OF LITERATURE

To best address our research question we have organized our review of literature into macro, meso, and micro levels to examine the complexity of student success and funding in Puerto Rico higher education. The macro level addresses the federal and municipalities funding that is contributed to Puerto Rican college and universities (PRCUs). The meso level examines the differences in federal and municipalities sources between private and public sectors, and expenditures per student by section. Finally, the micro level focuses on the portion of students in Puerto Rico receiving financial aid, and considerations for centering student voices.

Macro

PROMESA. In June 2016, the Obama administration passed a bill to address the economic crisis of Puerto Rico called the Puerto Rico Oversight, Management, and Economic Stability Act (PROMESA), which established an unelected Fiscal Control Board (FCB), known colloquially in Puerto Rico as “La Junta.” The FCB approved a fiscal plan for the next decade (2017-2026) that cut deeply into Puerto Rico’s public service budget including cuts to health care, pension, and education. The University of Puerto Rico system (UPR) has faced and will continue to face drastic decreases in municipalities appropriations over the next several years. By fiscal year 2022, appropriations will be under \$400 million, which is 56% lower than the \$879 million at which the Puerto Rico government has historically funded the UPR system. Not only are government appropriations decreasing for Puerto Rico’s primary four-year public system, but the undergraduate tuition rate is climbing; it has more than doubled from \$57/credit in 2017-18 to \$124/credit in 2018-2019 (the cost is \$134/credit in 2020-2021). With 43% of residents living in poverty (a level three times that of the national average) and over 70% of public university students qualifying for some

type of financial aid, affordable education is necessary for college access and completion in Puerto Rico. Ultimately, PROMESA and, by default, the FCB has established an overtly politicized situation whereby an unelected governing body is choosing to underfund the higher education sector, which, in turn, is limiting financial opportunity to support students, faculty, and institutions.

Infrastructure Challenges

The funding cuts in the public service budget due to PROMESA exacerbated an already weak infrastructure in Puerto Rico by slashing or postponing necessary investments in facilities. Some of these investments include transportation and building infrastructure (Brusi & Godreau, 2019). For example, public transportation on the island is fairly limited—with little service being provided outside the San Juan metropolitan area, posing challenges for lower-income households without car access. This is especially concerning in a primarily commuter-serving postsecondary system. In addition to a limited transportation network, public buildings including K-12 and postsecondary institutions suffer from disinvestment and deferred maintenance preventing these buildings from being adequately maintained. As a result, when Hurricanes Irma and María struck Puerto Rico in September 2017, the university buildings sustained severe damages. The UPR system in particular experienced structural damages that cost the system more than \$132 million to fix. At the K-12 level, more than 250 public schools were permanently closed. The Hurricanes left 3.4 million Puerto Ricans without electricity and water and it took nearly 11 months after the storm for full power to be restored to the island. In order to ameliorate the financial challenges resulting from Hurricanes Irma and María, the U.S. Education Department set aside \$41 million in emergency relief funds, yet, just \$8.9 million of that funding has been distributed to the island. At the same time, stateside institutions that admitted Puerto

Rican environmental refugees were also receiving federal funding that comprised a large proportion of the federal aid allocated to the victims of the Hurricanes (Puerto Rico received one-fifth of that aid). As a result, these stateside allocations depleted financial resources for the Puerto Rican campuses, increased outmigration, and furthered the brain drain for Puerto Rico. Additionally, many federal funding streams that offer grants to support students, do not allow for funds to be applied toward infrastructure. This presents a unique challenge for Puerto Rican institutions since nearly all of them require some level of infrastructure improvement. This further disadvantages PRCUs by reducing their capacity to be competitive when applying for federal funds and simultaneously not allowing them to use funds received to actually improve infrastructure (in many cases).

Title V Funding

Since 1995, the federal government has allocated funds for institutions serving Hispanic students through the Title V grant developing the Hispanic-Serving Institutions (HSIs) program. However, Title V funding has not kept pace with the growing demography of the Hispanic population, shifting enrollments, and the growth of emerging HSIs. This has resulted in over half (60%) of Title V designated eligible HSIs not receiving funding. Therefore, being designated as an HSI does not guarantee Title V funding, which has created a highly competitive pool of HSIs seeking funding.

In order to receive Title V funding, institutions must be Title V designated eligible, meaning institutions must meet the federal definition of an HSI,¹ enroll a high concentration of low-income students and have low core expenditures as determined by the Department of Education before

¹ An accredited, degree-granting public or private institution with 25% or more total undergraduate Hispanic full-time equivalent enrollment

formally applying for eligibility. Once an institution is granted Title V eligibility they must then complete an additional application to compete for Title V funding.

In 2019-20, there were 64 institutions in Puerto Rico that met the federal definition of an HSI yet in the past decade (2010-19) just 34 private institutions and 11 public received a new Title V grant with some institutions being awarded the grant more than once. Additionally, the situation is further complicated because many institutions in Puerto Rico are in need of infrastructure spending (facility repair/improvement, equipment, etc) and Title V is one of few grant funding streams that allow for infrastructure spending. Most federal (ED and NSF) funding is meant to support programming only with minimal or no infrastructure spending. As previously mentioned, due to Hurricanes Irma and María and the 2020 earthquakes, Puerto Rican institutions are in need of physical repair/improvement, equipment and new technology. It is crucial to ensure that Puerto Rico institutions of higher education are receiving equitable access to Title V funding as seen in stateside higher education.

Meso

Higher Education Organization and Student Distribution. Despite Puerto Rico's expansive higher education sector, there are significant differences in the organization and operation of its institutions. In particular, the public 4-year universities are more selective than their private counterparts, which has resulted in the latter tending to serve students who are traditionally underserved in higher education (e.g., lower socioeconomic status, less academically prepared, first-generation college students). This is a difficult reality as private institutions are more reliant on tuition and fees as a primary source of revenue, while public institutions have greater access and can rely on federal and municipality funding sources (Labandera et al., 2021). This may change, however, as Puerto Rico's

oversight board prescribed significant cuts to public higher education arguing that grants and increased tuition would offset those cuts (Leachman & Sullivan, 2020). This ultimately suggested that all PRCUs may eventually view tuition and fees as their primary revenue source. A final notable factor regarding student distribution at public PRCUs is that, overall, Puerto Rico is a net exporter of students pursuing higher education (www.ed.gov), suggesting minimal opportunity to increase revenue via out-of-state tuition and fees.

Primary funding sources by institutional sectors. The primary revenue sources for institutions of higher education in Puerto Rico are considered federal appropriations, state and local funding, tuition and fees, and others including private grants and contracts (Labandera et al., 2021). The private and public sectors rely on different resources. The private non-profit institutions significantly rely on tuition and fees. Prior to 2016, private for-profit institutions relied on both federal appropriations and tuition and fees. However, since 2016, their main source of revenue has been tuition and fees. The public institutions consistently have relied on state and local funding as their largest sources of revenue.

Yet, the state and local funding to public universities has been decreasing since 2017. According to Brusi and Godreau (2019), La Junta—Puerto Rico's oversight board—proposed budget cuts to public universities, with moving targets of first \$350, followed by \$450 and \$500 million, which is equivalent of 1/3 of the University of Puerto Rico system's total budget (Cordero, 2017). This was followed by raising tuition (Alicea, 2018) along with a campus consolidation plan that reduced faculty and staff positions (University of Puerto Rico, 2018a). For instance, the total headcount of the faculty and staff in FY'18 was 12,799, which was planned to be 10,650 by FY'23 through the reduction of faculty-administrative personnel by 17-20%, transitory/temporary personnel by 2-5%, and non-faculty by 2-10%,

respectively; the increase of faculty personnel was proposed to be 3% until FY'21, then no increase from FY'22 projecting the total savings to be \$97,898 by FY'23 (University of Puerto Rico, 2018b). While these changes increased concerns for access and quality of education they also emphasized that institutions need to seek opportunities to diversify their revenues in order to generate new income and become self-sufficient (Redden, 2019).

Federal appropriations and local funding sources by institutional sectors. The share of government (federal and local) expenditure devoted to higher education in Puerto Rico was reported comparatively higher than other Latin American and Caribbean countries as well as upper-income countries (Ladd & Rivera-Batiz, 2006). According to the State Higher Education Finance data on Puerto Rican higher education, about 91.3%-96.1% of the public funding was from state support between 2012-2016, followed by 3.9%-8.1% of net tuition revenue, after 2011 where 14.7% of the funding was supported by the American Recovery and Reinvestment Act (ARRA). The state (Puerto Rican) funding was mostly through the forms of tax appropriations and non-tax support (93.3% and 6.7%, respectively, in 2016).

Public spending, particularly state support, may not extend to the students in the private sector, as private, non-profit institutions have very minimal state and local funding along with some federal appropriations, grants, and contracts (Ladd & Rivera-Batiz, 2006). Interestingly, for private for-profit schools, almost over half of the revenue came from federal appropriations, grants, and contracts until 2015-16, which was then discontinued in 2016 (Labandera et al., 2021). Ladd and Rivera-Batiz (2006) emphasized the importance of acknowledging the high reliance on Pell grants in private institutions.

Public universities have a high reliance on commonwealth operating support. The federal government provided about 15.8% of university revenues, along with indirect

funds through student aid programs (Ladd & Rivera-Batiz, 2006). The oversight board—La Junta—wants to cut those subsidies to approximately \$400 million by 2024, claiming that more federal funding and other grants, as well as tuition hikes, will partly offset the cuts. The board also plans to cut the university's operational expenses by some 10 percent, but most experts believe that the cuts will be much deeper (Leachman & Sullivan, 2020).

Expenditures per student by private and public sectors. Expenditures within Puerto Rican institutions have increased for the last two decades. An analysis of the Integrated Postsecondary Education Data System (IPEDS) showed that Puerto Rican public institutions have spent significantly more compared to private institutions. Spending reached \$1.4 billion at public institutions compared to \$830 million at private not-for-profits, and less than \$268 million at private for-profit institutions (Labandera, Santiago, & Laurel, 2021). Yet, any analysis beyond the sum of expenditure is outdated, which does not capture the contemporary context of Puerto Rican higher education. For example, Ladd and Rivera-Batiz (2006), from the analysis of IPEDS in 2001-02 found that the average expenditure at private colleges and universities in Puerto Rico per student (\$4,507) is less than a third of that spent in the public institutions. The authors explained this gap into the significant differences in the numbers of student-faculty ratio: in 1999-2000, the ratio of 14.9 students per faculty member in the island's four-year public universities was about two-thirds of the ratio of 23.7 in the less well funded private universities. Again, since this data is from 20-years ago, the trends in expenditure need to be updated and explained in the current context as well as considering the operation of different types of institutions in Puerto Rico. The fact that the available data for Puerto Rican institutions is approximately 20 years old speaks further to the disparities prevalent in the way that Puerto Rican

institutions are represented within the context of American higher education.

Meanwhile, some scholars attended to the importance of focusing on the allocation of the expenditure across different activities. Based on Berger and Milem's (2000) model for organizational influence on student outcomes, Núñez and Elizondo (2012) argued that expenditures and sources of revenue for different institutional functions represent resources allocated to support students and other areas, which eventually contribute to students' graduation rates. While their study did not compare public and private institutions in Puerto Rico, the analysis conducted compared 4-year HSIs in the U.S. mainland and Puerto Rico. Based on the analysis of IPEDS data (2008-09), the study highlighted two findings: 1. HSIs in the U.S. spent significantly more (\$19,005) than those in Puerto Rico (\$6,905) on academic and social support per student and administration per student (\$7,494 versus \$2,475, respectively). 2. The expenditure on academic and social support and administration was positively correlated with the graduation rate of Hispanic students. Yet, if the relationship between financial expenditure and student

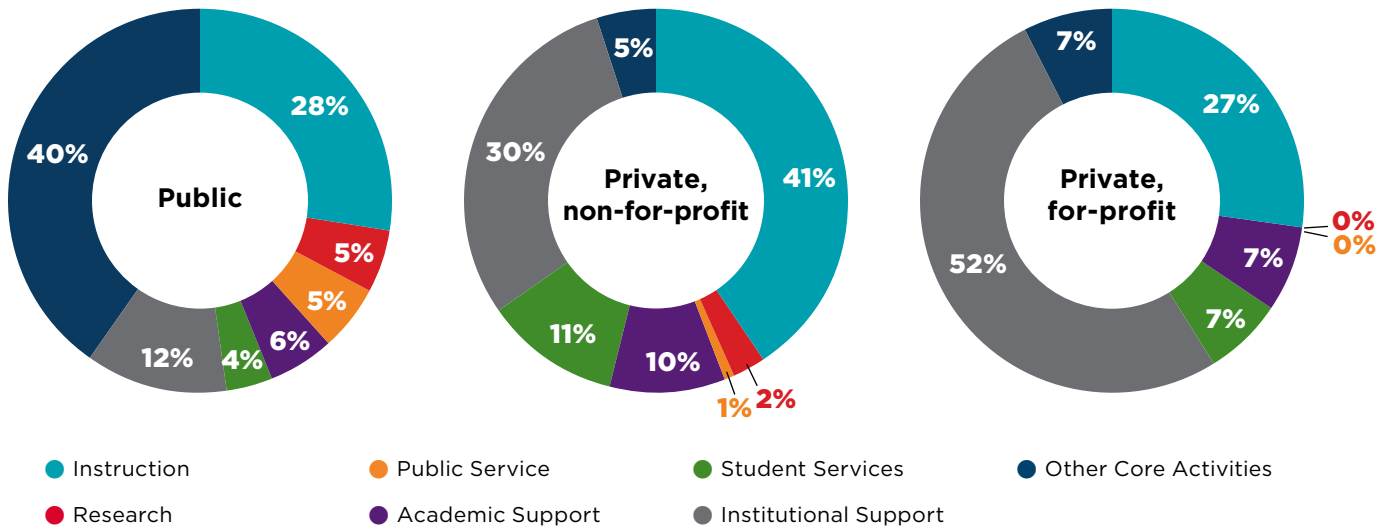
outcomes will hold to the same degree for the Puerto Rican institutions is still a remaining question.

In the following study, Núñez, Crisp, and Elizondo (2016) analyzed the same data, explaining more specific "resource" dimensions including the expenditure on the instruction, academic support, student services expenditure. The results showed that HSIs in Puerto Rico are unique as they show a lower level of expenditures (per FTE) on instruction (\$3,121.40), followed by academic support (\$872.67) and student services (\$648.25). While this reflects the expenditure at HSIs in Puerto Rico in 2008-09, the authors of this report analyzed data from 2019-2020 to provide the current picture of expenditure across different sectors. Table 3.1 and Figure 3.1 show that the level of expenditure for education and related activities are highest among the public institutions (\$30,138.50 per FTE), followed by private for-profit (\$13,618.85) and private non-for-profit (\$9,186.56). It is noticeable that instructional expenditure consists of about 42% of the total expenditure at private, non-profit institutions, compared to public and private for-profit institutions where 29.43%

Table 3.1: Per-FTE Expenditure by Activity Categories, 2019–2020 (USD)

| | All 4-yrs | Public | Private, non-for-profit | Private, for-profit |
|-----------------------|-----------|----------|-------------------------|---------------------|
| Instruction | 4594.53 | 8308.71 | 3746.25 | 3726.77 |
| Research | 449.88 | 1605.36 | 234.71 | 0 |
| Public Service | 362.6 | 1670.86 | 79.23 | 0 |
| Academic Support | 1063.81 | 1684.29 | 907.48 | 972.85 |
| Student Services | 1043.8 | 1186 | 1039.33 | 907.15 |
| Institutional Support | 3650.65 | 3619 | 2745.27 | 7027.69 |
| Other Core Activities | 2700.57 | 12064.29 | 434.29 | 984.38 |
| Total | 13865.84 | 30138.51 | 9186.56 | 13618.84 |

Figure 3.1: Percentage Expenditure by Activity Categories, 2019–2020



and 27% of the expenditure was allocated for instructional activities, respectively. Private non-profit institutions showed a relatively higher level of allocation on student services and academic support activities compared to other institutions. It is also important to note that institutional support—mostly spending on administrative activities—was the highest expenditure category for private for-profit institutions. Public institutions spend about 41% of the expenditure on other core activities.

Micro Financial Aid for Puerto Rican Students.

As previously mentioned, the passing of PROMESA proposed to cut \$450 million from the UPR system over a span of three-years. The University of Puerto Rico’s 11-campuses became sites of protests and strikes for students to challenge the proposed fiscal plan submitted by the former Gov. Ricardo Rossello Nevaes, which ultimately increased tuition and the amount of student loans needed to attend the university (Martinez & Garcia, 2018). This is just one example of how Puerto Rican students have mobilized

against austerity measures and the increased reliance of privatization at UPR. Therefore, it is important to not only consider how federal aid is granted to support student success, but how students perceive federal support and their own notions of success as they navigate Puerto Rican colleges and universities.

The National Association of Independent Colleges and Universities (NAICU) houses the most recent data applicable to federal student aid awarded in Puerto Rico that is allocated state-wide and by Congressional district. In Puerto Rico, federal student aid is provided through Pell Grants, campus based programs (i.e., SEOG, federal work-study, Perkins Loans), and federal loan programs. In January 2021, NAICU reported that \$132 billion was provided to support Puerto Rican students via federal student aid programs. In 2019-2020, NAIC reported \$802,508,233 in federal pell grants awarding 165,667 in student support. In 2018-2019, NAIC reported \$32,039,575 in campus-based programs awarding 75,061 to support students. For federal student loans inclusive of subsidized, unsubsidized, PLUS, Grad PLUS, and Grad unsubsidized, NAIC reported a grand total of

\$702,188,465. While the federal student aid awarded to support Puerto Rican students appears to be vast, very little is known about how Puerto Rican students experience financial support or barriers while attending their respective colleges or universities across the island. In fact, there is a substantial history of Puerto Rican college students protesting the federal government for defunding public education to aid in the debt crisis on the island (Martinez & Garcia, 2018)

IMPLICATIONS/SPANNING THE BORDERS OF RESEARCH

Recommendation #1: Existing laws and access to reliable data may be limiting access to potential funding sources.

As highlighted by recent reports from the State Higher Education Executive Officers ([SHEEO], 2021), overall funding for higher education across the United States has been on the decline from state governments requiring many higher education sectors to turn to non-government sources to supplement their finances. However, Puerto Rico faces difficulty in pursuing some of these funding streams due to existing laws and available data. For example, because Puerto Rico maintains the age of majority at 21 (31 L.P.R.A. § 971), higher education institutions and other affiliated organizations are limited in their ability to pursue research grants and other funding opportunities requiring student consent as most traditionally-aged college students are not legally able to sign contracts on their own behalf. Moreover, as Puerto Rico does not maintain a centralized database or source for educational data, there is additional difficulty in establishing a baseline understanding of existing barriers for student success and how finances play a role. Notably, during the 116th U.S. Congresswoman González-Colón introduced the “Puerto Rico Data Collection Equality Act,” which would alleviate some

of these data concerns by expanding data collection and use, but it failed to make it out of committee and has not been reintroduced during the current congressional session.

Recommendation #2: In order to better connect higher education finance and budgeting and student outcomes, future research might consider socio-political factors.

Beyond describing how different revenue sources supported higher education institutions, future research should further unpack how socioeconomic and political changes influence institutions’ strategies to cope with the pressures to make up for the lost revenue, considering different levels of autonomy institutions have. The impact of changing revenue structure on students’ access, affordability, and quality of education should be also examined. Second, while some studies that included a set of Puerto Rican institutions showed a significant connection between institutional finance, including the expenditure of resources across different activities, and student outcomes, future research should further examine the impact of the financial environment on students’ collegiate experiences and outcomes beyond retention and graduation. This attempt also should systematically consider the diversity in students’ backgrounds as well as their respective institutions. Finally, in many studies or analyses of the financial context of institutions, particularly in terms of state-level budget, many studies simply justify their choices of excluding Puerto Rico due to “lack of comparable data” or “the unique socioeconomic and educational circumstances” (Leachman & Sullivan, 2020). This calls for two areas for future endeavors. First, information on Puerto Rican colleges and universities should be included in some of the data collection practices provided by the State Higher Education Executive Officers, National Research Council, etc. Also, the data on student experiences

or achievement for college seniors or recent college graduates is absent (Ladd & Rivera-Batiz, 2006). How to collect and utilize these data in conjunction with the financial variations across institutions can be discussed for future improvement.

Recommendation #3: Inequitable distribution of federal grant funds between the public and private institutions in Puerto Rico is divisive. Collaboration among all institutions is needed.

In the states, public universities are more accessible, with lower tuition and higher acceptance rates than most private institutions. However, that is not the case in Puerto Rico where the public system (UPR) is the more selective institution, despite slightly lower tuition. The UPR still maintains better facilities, more opportunities for research, graduate degrees and future employment and as such, it remains the preferred institution for students coming from private and/or more wealthy K-12 experiences. It is logical to assume that reviewers for the NSF and the Department of Education grant awards would hold views that things operate similarly in Puerto Rico. This creates a cyclic pattern where the UPR system continues to get the majority of federal funding, therefore continuing to improve their facilities and student support systems, therefore attracting the more competitive and privileged students and therefore perpetuating the cycle. The largest private university system in Puerto Rico is the Interamerican System (11 campuses) and it serves a student body of 75-90% Pell-eligible across their campuses, which is higher than the Pell eligibility rate at the UPR system. So the private institutions are getting less federal funding (grants and otherwise) and they are

serving the poorest, most rural, students from the public school K-12 system while the UPR is serving the wealthier, privately (K-12) schooled students. Another dissimilarity from the states is that the public system in Puerto Rico, the UPR system, is governed by administrators that are appointed by the governor, so those positions change with the political climate. These complexities create a funding environment where the most vulnerable students do not have access to the institutions that are receiving the most federal funding.

In the United States, it is common for multiple campuses of one institution and/or entirely different institutions to collaborate on proposals for grant funds. Many funding agencies/funding streams grant priority and/or larger budgets to collaborative projects. In Puerto Rico, collaboration is far less common based on past award details from both the Department of Education (<https://www.grants.gov/>) and the National Science Foundation (www.nsf.gov). One university on the island received a disproportionate amount of the allocated funds from the National Science Foundation in 2019 (NSF, 2020). In order to affect change to the degree that these programs seek, funding should be distributed more equitably across the island's many institutions. Anecdotal experiences of an external evaluator on the island reveal a lack of desire to engage in collaborative proposal writing among different institutions and within institutions among different campuses. A climate of competition has been observed. Efforts to encourage collaboration have been poorly received. Further exploration of this phenomenon as well as localized efforts to encourage and foster collaboration are needed.

Lessons Learned and Where Do We Go from Here

Association for the Study of Higher Education 2021 Institute with Puerto Rican Higher Education Leaders

Jason Guilbeau, Monica Hernandez, Vanessa A. Sansone and D-L Stewart

After presenting what we found to our Puerto Rican colleagues, we listened. And we were able to learn a lot from those living, working, and attending Boricua institutions of higher education.

Here is what we learned...

We learned that there is much more to be done and much more that needs to and should receive the attention of scholars of U.S. higher education. First, we were cautioned to acknowledge and understand the demographic heterogeneity of the Puerto Rican population, particularly related to Black and Indigenous Puerto Ricans and the ways that colorism has contributed to educational inequality. Second, as is generally true of U.S. higher education scholarship, there needs to be attention given to faculty in Puerto Rican postsecondary institutions and how they are affected by student and institutional stressors. Another commonality throughout higher education scholarship was the call to attend to the mental health of students, not just from societal conditions but from their work as activists and some of the institutional conditions they are studying under, like those caused by the delayed recovery efforts of natural disasters. Fourth, it was made clear to us that there are many opportunities for learning in partnership with Historically Black Colleges and Universities (HBCUs). Like HBCUs historical origins centering the education of Black students, colleges and universities in Puerto Rico begin with centering Puerto Rican students and do so from a culturally supportive and asset-based orientation. Fifth, we were reminded that research on Puerto Rican higher education is being done by Puerto Ricans, but that most of this work is written in Spanish. Thus, there is a need to reconsider what we think of when we look for and cite scholarship. Because the research conducted in Spanish is no less significant than work written in English. Finally, another symmetry we recognized was how COVID-19 illuminated inequities regarding access to the technology needed to continue to learn. Again, there is more work to do and the ground is rich for cultivating deeper partnerships between scholars across the U.S. political and geographic landscape. We hope that this report serves as a representation of this partnership, and acts as a call to action for more researchers to do the same. But in doing so, we encourage you to work with, and not on, communities, as we have done here. And most importantly, listen to, and engage with community members, who are holders of knowledge. Because we have taken this approach, we believe this work is that much stronger.

Thank you



A special thank you to all of our participants and leaders from Puerto Rico's colleges and universities.



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