

Empowering Hispanic Students in STEM through Financial Literacy

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<u>ABSTRACT</u>

The session will report on successes of addressing financial literacy of students in a collaborative DOE project between two state colleges and a Hispanic Serving Institution (HSI) university with a combined 140,000+ undergraduate students. The overall mission of the project was to sustain effective initiatives across the participating institutions that support increasing the numbers of Hispanic and Low-Income students who receive an AA degree from the state college, transfer to FAU to complete their BS in CS and then, to be successfully employed by a dynamic high-tech industry. This session will specifically report on several key learning outcomes: including (i) Development of fourteen (14)specialized modules enhancing financial capability and well-Being of postsecondary engineering students (ii) Professional development through the financial literacy Informational program for STEM mentors; (iii) Breaking financial barriers for successful completion of engineering programs for Hispanic Students: (iv) mentors activities in support of state College students; and (v) institutionalization of the projects' initiatives to provide on-going and continuous support for HSI students. The presentation will delve into practical strategies aimed at empowering Hispanic and Low-Income students, ensuring they not only access education but also successfully navigate financial challenges as they progress in their academic journey.

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II. Overview of the Project

The Title III HSI project has been dedicated to implementing a comprehensive support system to enhance the academic success and career pathways of Hispanic and Low-income college students, specifically those who commence their education at a state college and then transfer to FAU to pursue bachelor's degrees in Electrical Engineering (EE), Computer Engineering (CE), and Computer Science (CS), aligning with their career aspirations. The emphasis on Computer Science is particularly significant due to its profound impact across various sectors of society, industries, the economy, national security, and the educational landscape.

The COVID-19 pandemic has triggered substantial shifts in higher education, altering instructional delivery methods for thousands of college students and necessitating the widespread adoption of new technologies, whose impact on student learning remains uncertain. Simultaneously, the

imperative to maximize the career trajectories of HSI and Low-income students in burgeoning fields such as Artificial Intelligence, Autonomous Systems, and Machine Learning has become increasingly apparent. The heightened demand for graduates with robust computer science backgrounds, evident in both tech giants like Google, IBM, and Microsoft, and countless small start-up companies like Zoom, underscores the urgency for universities to produce STEM graduates capable of meeting the nation's evolving infrastructure and security needs.

A second critical challenge is to enhance the representation of diverse populations, including lowincome and underrepresented minority (URM) students, particularly Hispanics, in engineering disciplines. Our focus on computer science, computer engineering, and electrical engineering is poised to make a substantial contribution to addressing America's technological challenges and fostering a more diverse workforce. Below are brief descriptions of the partnering institutions:

Florida Atlantic University (FAU): A large, diverse institution offering 180 undergraduate and graduate degree programs, designated as a "High Research Activity" university by the Carnegie Foundation. FAU serves over 30,000 students and boasts the most racially and ethnically diverse student body in Florida. The College of Engineering and Computer Science, along with the Department of Electrical Engineering and Computer Science (EECS), is located on the main campus. All EECS degree programs are ABET accredited, offering flexible course schedules through various formats, internships with numerous business/industry partners, and an Innovation Leadership Honors Program focusing on innovation, entrepreneurship, leadership, and sustainability.

Broward College (BC): Serving more than 60,000 students, with 35% identifying as Hispanic and over 55% eligible for Pell grants. BC offers 132 Bachelor's, Associate's, and certificate programs, both online and on-campus. It prides itself on its diverse student body, with representation from over 175 countries, and ranks prominently in national standings for awarding Associate degrees, particularly to minority students.

Palm Beach State College (PBSC): Serving more than 40,000 students, with 27.5% identifying as Hispanic and 53% of full-time students eligible for need-based aid. PBSC offers 130 programs and 13 primary areas of study, including Computer Science & Information Technology and Science & Environment. It is a significant producer of Associate degrees and serves as a crucial pathway for students to seamlessly transfer to FAU, a requirement for participation in the present project.

III. Student Enrollment and Graduation Trends

III.1 National Trends in 2-Year College Enrollment and Graduation of AA STEM Majors

The plethora of data and institutional/organizational reports provide clear evidence of the morethan-anticipated impact of Covid-19 not only on student attendance, but also in terms of how it impacted students' vision for their future, their potential career pathway, their confidence in their own abilities to be successful, and their motivation to remain in school and transfer to the University to complete their BS degrees. As a result, for many, their transfer to the University has been extended beyond the three-year usual time frame. The track record, nationally, indicates that only about one-third of two-year state college students transfer to a university within four years (https://www.ncan.org/page/TransferPathways). The trends that we observe locally mirror those reported nationally by groups such as the Aspen Institute's College Excellence Program. Their latest report indicates that only 14% of the state college (2-year colleges) students earn a bachelor's degree in 6 years. The recent National Student Clearinghouse Research Center (NSCRC) 2020-21 Report (Bobbitt, R. et al., Aug 2021) indicated that higher education lost about 191,500 transfer students in 2020-21, three times higher that 2019-20. Interestingly, HSI universities also reported a substantial loss in the number of transfer students,(-11.8%).

III.2: Florida Trends in Enrollment and Graduation

The Florida College Access Network (FCAN), June 2020, report noted that 42% of the currently enrolled college students said that their plans changed including taking a semester or a year off. Other data (FCAN, April 2018) indicate that the *three-year AA-degree completion rate* of the Broward College cohort was 37.7%; for Palm Beach State College, the three-year AA degree completion rate was 41.8%. We also note that the state college students differ, in general, from the University students, in that they are usually older (25.8 years vs 20.1), they usually take fewer credits (8.7, semester hours vs 10.3 semester hours), and likely to juggle family, work, longer commutes to class and often require developmental education due to open access and enrollment. Statewide, the Florida Department of Education reported that ~55,000 students had withdrawn from Florida's 28 state colleges during the height of the pandemic (i.e., 2020). Both Broward College and PBSC experienced significant declines as indicated previously during both 2020 and in 2021.

III.3: General Trends across FAU -BC -PBSC in Enrollment – 2016 -2022

While the grant was awarded in November, 2016, the first cohort of state college students did not begin until the fall of 2017. *Given the trend of graduating within 2-4 years, almost all students in the HSI project have been impacted by the Covid-19 pandemic*. So, those who started in 2017 should have (or would have) graduated in 2020; those starting in 2018 would have graduated in 2021. For most of these Hispanic and Low-Income students, it has been difficult for them to remain focused and motivated to complete their AA and BS degrees in a timely fashion. In fact, we noted that, in general, state college students were more likely to withdraw from college, take a semester off, take fewer classes, and, as a result, start taking considerably longer to achieve their AA degree and transfer to FAU.

IV. Empowering Students through Financial Literacy

The Title III leadership team decided to address a key nationally identified barrier to college enrollment and completion for Hispanic and low-income students, namely developing participant financial literacy competencies known to be critically important during and after their college degree program. The persistent issue of students abandoning their college degrees due to financial constraints remains a significant challenge in the educational landscape. This problem is particularly acute for Hispanic and Low-Income students, whose families are disproportionately burdened by financial pressures. Numerous studies have unequivocally shown that financial concerns give rise to chronic stress, anxiety, and even depression among students, disrupting their focus on studies and impeding their long-term aspirations. This financial strain often forces students into high-risk decision-making, leading to potentially devastating consequences.

Statistics reveal that a significant percentage of Hispanic students come from low-income backgrounds. According to the U.S. Census Bureau, in 2020, the poverty rate for Hispanic individuals stood at 18.7%, higher than the national average of 9.1%. Consequently, a substantial number of Hispanic students struggle to meet the financial demands of higher education, leading to a higher attrition rate when compared to their peers from more affluent backgrounds. This financial strain not only impacts their initial enrollment but also affects their ability to persist and graduate within a reasonable this financial burden, combined with a lack of adequate financial literacy, creates a cycle of challenges that significantly hinder their educational progress. In this context, the focus of our study is to examine the effectiveness of a Financial Literacy Workshop designed specifically for Hispanic and low-income students attending HSIs. This workshop, drawing from national resources and tailored to address the unique challenges faced by Hispanic students, aims to empower them with the financial knowledge required to navigate the complexities of higher education successfully. By examining the applicability of this program in HSI settings and analyzing its learning outcomes and evidence of success, this study endeavors to contribute meaningfully to the ongoing dialogue on financial literacy interventions tailored for underprivileged students. Through these efforts, we strive to pave the way for a more inclusive and equitable educational landscape for all students, irrespective of their socioeconomic background. Central to our session is the presentation of an informative and engaging PowerPoint, expertly crafted and iteratively refined by mentors.

IV.1 Financial Literacy Workshop: The workshop aims to educate students about the financial implications of dropping out of school and the long-term consequences thereof. Recognizing a critical barrier to college enrollment and completion for Hispanic and low-income students, the Title III leadership team embarked on addressing financial literacy competencies essential for participants during and after their college degree programs. Our approach drew from the United States Government's document titled "Opportunities to Improve Financial Capability and Financial Well-Being of Postsecondary Students," prepared by the US Government's Financial Literacy and Education Commission. Additionally, guidance from the Federal Deposit Insurance Corporation's (FDIC) Money Matters initiative informed our efforts.

The mentors diligently crafted and refined an informative PowerPoint presentation, designed for open-ended discussions with participants on the importance of timely graduation from college and the consequences of failing to do so. The presentation topics highlighted for State College students include:

	<i>v</i> 1	
Financial Literacy – A	Module 6: Credit	Module 11: Protecting Your Identity
College student's Decision-	Reports and Scores (1)	and Other Assets (1)
Making Resource (Adapted		
from FDIC)		
Module 1: Your Money	Module 6: Credit	Module 11: Protecting Your Identity
Values and Influences	Reports and scores (2)	and Other Assets (2)
Module 2: You Can Bank on	Module 7: Borrowing	Module 12: Making Housing
It! Banking Basics	Basics	Decisions
Module 3: Your Income and	Module 8: Managing	Module 13: Buying a Home
Expenses	Debt	
Module 4: Your Spending	Module 9: Using Credit	Module 14: Disasters – Financial
and Savings Plan	Cards	Preparation and Recovery
Module 5: Your Savings	Module 10: Building	
-	Your Financial Future	

 Table 1: Financial Literacy Workshop Webinar and Modules Titles

Due to space constraints, this paper will review the contents of Modules 1, 3, 4, and 6 of the above table:

Module 1: Your Money Values and Influences:

This module emphasizes understanding personal values and how they impact financial decisionmaking. It encourages students to reflect on their attitudes towards money, spending habits, and long-term financial goals. Through exercises and discussions, participants explore how upbringing, culture, and societal influences shape their financial behaviors, stressing the importance of aligning financial decisions with core values for greater well-being.

Module 3: Your Income and Expenses:

Students learn effective income and expense management, covering budgeting, spending tracking, and goal setting. They create tailored budgets, learning to allocate income towards essential expenses, savings, and discretionary spending. Practical strategies for expense reduction, savings increase, and planning for unexpected costs are taught, along with discussions on various income sources and their optimization for financial stability.

Module 4: Spending and Savings Plan:

This module entails:

- Understanding Finances: Participants analyze income and expenses to comprehend their financial situation better.
- Creating a Budget: Students develop budgets aligned with goals, learning to track spending and adjust budgets accordingly.
- Setting Financial Goals: Emphasis is placed on SMART goals, providing motivation and strategies for goal prioritization.
- Developing Saving Habits: Students are encouraged to save regularly using techniques like automatic transfers and paying themselves first.

• Review and Adjustment: Regular review ensures the spending and savings plan remains effective, allowing for progress monitoring and adjustments.

Module 6: Credit Report and Scores:

This module educates students on the importance of credit reports and scores in their financial lives. It covers how credit works, what factors influence credit scores, and how to maintain good credit health. Below is some details of the module:

- Understanding Credit: Students learn credit's importance in financial transactions and its impact.
- Credit Reports and Scores: Participants explore credit reports' comprehensive nature and credit scores' calculation, emphasizing regular monitoring.
- Factors Influencing Credit Scores: Key factors affecting scores are discussed, enabling proactive steps for improvement.
- Maintaining Good Credit Health: Strategies for maintaining good credit health are provided, stressing the significance of responsible credit management.
- Maximum Credit Score: The maximum credit score, typically 850 in the U.S., is discussed along with its rarity and desirability.
- Impact of Credit Scores: The wide-ranging impact of credit scores on financial aspects such as loan approvals and employment opportunities is explored, highlighting the importance of maintaining a good credit score.

The above 14 modules aim to equip postsecondary students with essential financial knowledge and skills for enhanced capability and well-being, enabling informed decision-making and future financial control.

The development of the Financial Literacy Informational Program not only aimed to educate students but also provided valuable professional development for the mentors involved. Throughout the process, mentors gained enhanced knowledge and a foundational understanding of various aspects of financial literacy and their implications for students, as well as for their future careers as computer science engineers.

IV.2 Benefits:

- a. The development of the Financial Literacy Informational Program served as a professional development for the mentors themselves. In the process, the mentors gained increased knowledge and a basic understanding about different but general aspects of financial literacy as it impacts them as students and eventually as career-computer science engineers.
- b. The mentors were planning a live webinar for the State College participants/ mentees immediately following spring break 2021.

- c. The Mentees from our two partner State Colleges were mostly working students whose schooling and jobs have been impacted by the Covid-19 pandemic. Gaining new financial insights and beginning to discuss these topics will increase their awareness of the types of information they need to know as well as the decisions they will need to be making as they return to school, their jobs and plan on graduating.
- d. By introducing the mentees to the 'whole world' of financial literacy including the wonderful resources that are easy-to-use and available free from the Federal Government, the presentation prepared by the Mentors will serve an important role in motivating State College Students/Mentees to think twice about dropping out of school given the financial implications of what happens to their college loans. *The presentation only highlights important ideas; it does not make suggestions or recommendations*. For that, they are encouraged to review these Federal Government resources with their parents, guardians or with the financial aid office at their college.
- e. Number of students served: The Financial Literacy presentation will be made available to all HSI students at FAU, BC and PBSC using several formats: email segments, YouTube video and as a video on the respective institutional websites (N- 177).

IV.3. Trends in Computer Science and Engineering Activities

The HSI- Title III research team and mentors employed various approaches to communicate with the students regarding what's trending in Computer Science, including:

a. Directly emailing the mentees.

b. Providing informational briefs to the state college coordinators for inclusion on their respective websites.

c. Presenting the information as part of a live Zoom webinar advertised to the mentees.

d. Including the information on FAU's HSI websites under 'Resources' (web enhancement ongoing).

e. Presenting a "What's Trending in Computer Science" webinar, currently available as a YouTube video.

Careers in Computer Science	Social Media	Game development – A			
– Salary as a Motivator	Applications	Closer Look			
Time Management – How to	Cyber Security	Virtual Reality			
Success during the Pandemic					
AI in Medical Imaging	Web	Mobile Computing			
	Applications				
Programming Languages	Cloud	Game Design Engines			
	Computing				

Table 2: Trends in Computer Science and Engineering

IV, 4 Benefits derived from Sharing Informational Briefs

- a. All HSI students have been directly contacted and provided with career-related what's trending briefs to re-invigorate and motivate their interest in computer science with the goal of student retention at the State College.
- b. As most of the mentees will be transferring to FAU, the briefs provided relevant information about how FAU faculty are deeply involved in conducting research and teaching about these very pertinent "what's trending" topics. This aimed to motivate mentees toward completing their AA degree so they could then enroll at FAU.
- c. The briefs highlight, where applicable, the local industry that hires students and graduates in these "*what's trending in computer Science*" fields. These were designed to motivate their career interest and job potential within the local area.

V. Project Evaluation

The project's success has been attributed, in part, to our proactive monitoring of student success throughout each semester of their enrollment in school. We swiftly provide support when needed and identify patterns and trends that impact student success, allowing for duplication and expansion of successful strategies. A cornerstone of our approach is the Project Multi-Year Longitudinal Database, which stores and provides accessibility to all student data over the 5-year project period. The database supports functions such as:

a. Collection, filtering, and random selection of State College student applicants and controls for each project cohort.

b. Tracking the academic progress and performance of participating and control students in each project cohort, initially at the State College and later upon their transfer to FAU.

c. Supporting the multi-year project evaluation and reporting process.

A primary focus of the project's longitudinal database is the integration of student records as they complete their AA degree and continue to the university to complete their Bachelor's degree in computer science. Moving forward, the project will continue to update the current databases for each cohort of students, enabling us to profile trends in student GPA, graduation rates, retention rates, and successful transfer to FAU. This ongoing data analysis will inform our strategies and interventions to further enhance student success and achievement.

Broward College		Palm Beach State College			
Cohorts	Initial	Enrollement	Cohorts	Initial	Enrollement
	Enrollment	after 2 years		Enrollment	after 2 years
1	42	9	1	40	13
2	48	12	2	39	17
3	42	26	3	33	30
4	7	6	4	15	13
5	4	2	5	27	15

Table 3. State College – Data Trends – Participants

 Table 4. Characteristics of State College Cohorts 4-5 (fall 2021- fall 2022)

State College	Overall GPA	Male	Female	Hispanic	% Graduated	Pell
BC	3.2	4	1	2	0%	83%
PBSC	3.1	27	3	13	0%	71%

State College Originally from	# of Students	Overall GPA
BC Grads at FAU	16	3.08
PBSC Grads at FAU	15	3.36
Average GPA	3.22	

This table includes students who are currently registered for classes at FAU. Approximately 13 other students who graduated from the state college are not currently in the college of Engineering. Our records indicate that they may have done the following: applied but never registered for class, decided to attend other universities, entered the workforce, and/or changed their majors.

VI. Conclusions

Over the past five years, the project has successfully carried out its identified activities, despite challenges posed by the Covid-19 pandemic. The pandemic prompted the development and implementation of new initiatives aimed at supporting participating faculty and students. These innovations have led to lasting improvements in the project's operations. Moreover, the project's implementation over the last five years has deepened our understanding of the needs of transfer students from State Colleges who are pursuing programs in Computer Science, Computer Engineering, and Electrical Engineering. This knowledge has provided valuable insights into how to better assist students in achieving timely graduations. The availability of personal advisors at the State Colleges (BC and PBSC) has been highly appreciated by students, as it provides them with guidance through their academic plans, along with strategies for success and referrals to support services. Additionally, the sharing of resources among campuses has proven beneficial to

both students and support staff. Students benefit from additional resources, while staff members naturally exchange best practices and innovative teaching technologies.

The effectiveness of the implemented model, as reported in the session, suggests that other institutions interested in promoting STEM programs may replicate it with success. This underscores the project's impact and potential for broader dissemination of effective strategies within the educational community.

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