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BOARD # 366: Empowering Student Success in Emerging Technologies through S-STEM Scholarships, Mentorship, and Workforce Development

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Her teaching, leadership, and mentorship have garnered significant recognition, including the 2021-2023 Northern Trust Bank of Florida Endowed Teaching Chair, the 2023 American Association of Community Colleges' Dale P. Parnell Distinguished Faculty Recognition Award, and the 2019 Women of Color in STEM College-Level Promotion of Education Award.

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Abstract

The Rebooting through EmTech Programs (REP) project addresses the critical shortage of skilled professionals in emerging technology (EmTech) fields by focusing on increasing STEM degree completion among low-income and underrepresented students, particularly in high-demand areas like data analytics, cybersecurity, and information systems technology. Miami Dade College, a large, diverse, Hispanic-Serving Institution, is well-positioned to lead this initiative, particularly as EmTech job opportunities in Miami-Dade County continue to grow faster than the national average. Funded by the National Science Foundation's S-STEM program, REP provides two-year scholarships to at least 60 full-time students who have earned associate degrees and are now pursuing EmTech bachelor's degrees.

In this poster, we highlight the key high-impact extracurricular activities that support REP scholars and present findings on the program's impact, including improved student retention, confidence, and community building. Through these efforts, the REP project aims to serve as a scalable model for advancing workforce readiness and degree completion among underrepresented groups, addressing the STEM shortage and promoting sustainable access to careers in emerging technologies.

Introduction

The demand for skilled professionals in computing and emerging technology (EmTech) is increasing at an accelerated rate. Between 2019 and 2029, computer and information technology occupations are projected to grow by 11%, surpassing other fields [1]. In Miami-Dade County, EmTech job opportunities are anticipated to grow by 7.3% over the next decade, exceeding the national average [2]. However, a gap in skilled professionals remains, as county data indicates that 50% of EmTech roles require a bachelor's degree and 12% require a master's degree [3]. Along these trends, the COVID-19 pandemic has increased economic disparities, with many Americans facing job insecurity or permanent layoffs, disproportionately affecting underrepresented communities. [4]. With economic shifts continuing to deepen inequalities, innovative training and recruitment pathways will be essential to meet industry demands. By 2030, 33% to 50% of the workforce will likely seek new roles, requiring either reskilling or upskilling to keep pace with technological changes [5]. Fast-growing areas in STEM, such as cloud computing, data science, artificial intelligence, and cybersecurity, offer more opportunities for career advancement [6].

To address these needs, Miami Dade College (MDC) offers specialized programs designed to prepare students for in-demand technology fields. For example, its Bachelor of Science in Information Systems Technology equips students with essential skills for managing information resources, supported by a state-of-the-art Cloud Computing Center that provides industry-aligned training in partnership with companies like Florida Power & Light and Amazon Web Services. MDC's Bachelor of Science in Data Analytics, among the first of its kind in Florida, prepares

students to analyze large datasets, with graduates securing roles at companies like Assurant and Carnival Cruise Lines. Additionally, the Bachelor of Science in Cybersecurity provides cutting-edge, hands-on training aligned with national standards, with graduates placed at firms such as CLEER and BankUnited.

To build on these specialized programs, MDC's Rebooting through EmTech Programs (REP) initiative supports a cohort of 69 scholars, increasing accessibility to EmTech education for underrepresented groups and creating a pipeline of skilled graduates. These scholars, expected to graduate by Summer 2025, are preparing to meet the in-demand roles in emerging technologies.

Background

To strengthen academic retention, career readiness, and socio-economic empowerment, the REP initiative takes a holistic approach to supporting students pursuing careers in EmTech. Through targeted activities, REP increases retention, develops career skills, and empowers underrepresented and low-income students to enter the EmTech workforce or pursue graduate studies.

In addition to financial support, REP scholars engage in various high-impact activities, each designed to play a unique role within the program:

- *EmTechConnect* pairs REP Scholars with adjunct faculty mentors who provide personalized guidance on academics, skill-building, and career planning. Mentorship has proven especially effective for underrepresented students, fostering academic progress and bachelor's degree completion among low-income students [7, 8, 9].
- *Early Alert MAP System* uses individualized My Academic Plans (MAPs) to monitor student progress, track credit accumulation, and ensure timely graduation. This proactive system, recommended by the National Center for Women & Information Technology, triggers alerts when students face academic challenges, enabling timely interventions through meetings with advisors, instructors, and support staff to keep students on track [10].
- *Savvy Tech* workshops, led by MDC's Center for Economic Education, cover financial literacy topics such as budgeting, credit, and saving, which are critical for academic success and long-term financial stability [11, 12]. On the other hand, *#IamRemarkable* workshops focus on personal branding and career confidence, covering effective self-promotion, negotiation tactics, conflict management, and strategies for advancing into leadership roles.
- *Summer Leadership Rotation Academy* provides three tailored tracks—Research, Internship, and Digital Upskilling—to build workforce readiness through applied experience. With recent studies indicating that only 43% of employers feel recent graduates are workforce-ready [13], programs like this are increasingly valuable. Each track aligns with scholars' career goals, emphasizing practical skills and industry certifications to improve employability [14].
- *Tech Up Space STEMinar Series* hosts virtual and recorded lectures featuring industry leaders and workforce readiness experts. Topics include portfolio building, networking, technical interviews, graduate school preparation, AI ethics and responsibility, and leadership. The blended format of lectures and podcasts allows students to access the content at their convenience, integrating learning into their academic schedules [15, 16].

Methodology & Key Outcomes

To assess REP's impact, a comprehensive evaluation was conducted, including semester surveys, focus groups across the three EmTech degree programs, and STEMinar-specific surveys. The collected data highlighted key outcomes in student confidence, academic support, and program satisfaction. Results from the 2023-2024 academic year's first-year scholars indicate high levels of confidence, support, and a strong sense of belonging within the program. Over 80% of students reported feeling confident in speaking up in class and collaborating with peers from diverse backgrounds. Although some students faced challenges in forming friendships and seeking advice on class-related issues, nearly 90% felt well-supported by both faculty and peers. Satisfaction with mentoring remained strong, with 64% of students expressing high satisfaction in the spring semester and 80% satisfied with the program overall. No notable differences in satisfaction were found based on gender or degree program, suggesting a consistently positive experience across diverse student groups.

Focus groups further highlighted scholars' appreciation for the financial support provided by REP, which was instrumental in covering educational and living expenses. Despite the virtual learning environment, students reported a solid sense of community and praised the commitment and responsiveness of instructors and mentors. However, they expressed a desire for more in-person interactions and better scheduling of events to accommodate work responsibilities. Throughout the 2023-2024 academic year, REP scholars participated in career-building workshops that significantly boosted their confidence and knowledge, with pre- and post-workshop ratings (on a scale of 1 to 5) showing improvements from 38.68% to 69.53%. Scholars highlighted the value of practical insights and tools provided, such as budgeting apps, LinkedIn profile enhancements, and technical interview strategies, and recommended future workshops incorporate more advanced topics, interactive elements, and flexible scheduling to better meet their needs.

In July 2024, the Evaluation Team conducted a comparative analysis of REP Scholars and non-REP EmTech students, examining fall-to-spring retention rates and current GPA. Statistical analyses, including t-tests, multiple regression, and logistic regression, revealed no significant differences in GPA. However, REP Scholars demonstrated a higher retention rate (96.67%) compared to non-REP students (87.70%) from fall 2023 to spring 2024.

Conclusion & Future Work

The REP initiative at MDC has effectively equipped underrepresented and low-income students with the essential skills needed for high-demand careers in EmTech through mentorship, financial literacy training, career preparation, and a seminar series. Surveys reveal increases in confidence, retention, and job readiness, with resume writing and interview preparation proving especially impactful. In Spring 2024, nine scholars graduated ahead of schedule, all securing roles in computing or advancing to graduate studies, with employed graduates reporting annual earnings of at least $72,800.

Building on these successes, the REP program continues to generate valuable insights through tailored academic resources, a structured mentorship network, and a curated workforce readiness series (STEMinars) that supports all computing and technology students. Ultimately, REP aims

to serve as a scalable model to advance workforce readiness and degree completion for underrepresented groups, addressing the STEM shortage and fostering long-term institutional changes that promote equitable access to EmTech careers.

Ongoing work focuses on refining support strategies based on program evaluation results and exploring long-term tracking of alumni outcomes to better assess REP's sustained impact on career progression and skill advancement in EmTech fields.

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