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Admin STEM for Success

Michael Mora

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Author: Michael Mora

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During the 2020-2021 school year, I was a senior at the Academy for Mathematics, Science, and Engineering (AMSE) in Rockaway, NJ. At AMSE, a STEM-focused four-year magnet high school program hosted at Morris Hills High School, participating in an extended internship senior year is a cornerstone of the learning process. Required to complete a STEM-related internship to graduate, Academy students are encouraged to seek out an internship they're passionate about in a field of their choice. The internship, which must be conducted under the mentorship of an industry professional, must meet the New Jersey-approved standards for a work-based learning experience (WBL) through satisfying Career & Technical Education (CTE) standards and gaining experience with Career Ready Practices. Although the internship is normally required to be completed in-person, due to the pandemic remote internships were permitted for the 2020-2021 school year.

Finding an internship:

Many Academy students look to complete their internships at local engineering firms, nearby corporations, or universities in the area. Though I do not plan to major in a STEM field in college, I plan to pursue a degree in finance which is heavily quantitative and requires mastery of various areas of mathematics. As a result, I initially set out to find an internship with a local university, hoping to contribute to research within the math department. Upon reaching out to Professor Bruce Bukiet, Professor of Mathematical Sciences at NJIT, to inquire about contributing to his research, Professor Bukiet informed me of an unexpected opportunity -- NJIT's STEM for Success program. STEM for Success, which is run by both Professor Bukiet and Professor James Lipuma, a faculty member in the NJIT Humanities Department, works to promote broader access to and participation within STEM fields for women and other under-represented minority groups. One of the methods through which they accomplish this goal is the "STEM in Your Home" initiative, a project where STEM for Success mentors create video demonstrations of STEM activities using household items for kids to do at home. As a Cuban-American, I'm passionate about finding ways to promote increased access for high quality education for minorities, especially the Hispanic community. The summer prior to my senior year, I had the opportunity to intern at the Latin American Legal Defense and Education Fund (LALDEF), a nonprofit organization based in Trenton, NJ that strives to defend the rights of the Hispanic population and promote greater access to health care and education for Latino families. Having gained a deeper understanding of the needs of the Hispanic population during my time at LALDEF, STEM for Success seemed to be a perfect opportunity to continue addressing these needs through providing greater access to STEM resources to both Hispanic and other minority children.

Conducting my own research:

After speaking with Professor Bukiet and Professor Lipuma in more detail about STEM for Success and the role I would play as an intern, I formally began my remote internship with the program in the fall of 2020 under their mentorship. Upon sharing my aspirations to use the STEM for Success platform to address the specific needs of the Hispanic and other ethnic minority populations, they encouraged me to pursue my own independent project from the very start. Using resources sent to me by the professors as a springboard for my own independent research, I first analyzed the factors holding back Hispanic students in STEM fields. After a few weeks of research, I found there to be a significant relationship between a lack of both financial education and STEM resources within minority-dense school districts. Put simply, many Hispanic students attend overcrowded, underfunded school districts with subpar STEM resources. American public schools in general, and especially these minority-dense schools, often also fail to provide adequate financial literacy education. Consequently, many Hispanic and other minority students who attend these schools graduate without having the necessary financial knowledge to effectively accumulate wealth over time. This financial illiteracy leads many to remain stuck in low-income communities, where their children attend the same school districts. Thus, their children therefore also receive inadequate STEM and financial literacy teaching, resources, and opportunities -- and so the cycle continues. After speaking with Professor Bukiet and Professor Lipuma about my findings, I decided to pursue an independent project within the "STEM in Your Home" initiative to make my own educational videos to teach both STEM and financial literacy concepts simultaneously.

Making my video mini-series:

After deciding on my project, I spent the winter and spring independently making an original mini-curriculum consisting of 3 lesson pairs (6 total videos). For each lesson pair, I used an experiment that can be done with household materials to teach both a STEM and financial literacy topic. The first video in each lesson pair included a list of materials for the activity, a demonstration of the experiment, and also taught the STEM concepts present in the activity. Then, the second video in each lesson pair included how the experiment from the first video can also teach key financial literacy concepts. More specifically, for my first video pair, I used rock candy to teach about both crystallization and delayed gratification. For my second video, I used popcorn to teach both the science behind why popcorn pops and the difference between net and gross income. For my third video, I used a popsicle stick bridge to teach about both bridge engineering principles and key budgeting concepts. From January-June, I worked 3-5 days a week producing my videos. Having never made my own videos before, I taught myself how to script, film, compile, and edit videos, learning how to design my own video production. In doing so, I familiarized myself with LightWorks, Davinci Resolve, Movie Maker, and Windows Video Editor, all of which I had no prior experience with. In addition to the audio and video instruction included within the videos themselves, I also wrote an activity plan for each lesson for teacher use. Upon completing each lesson pair, I had the privilege of presenting my videos live on monthly STEM for Success YouTube live streams to educators and students across NJ.

Takeaways:

Through my experience interning with STEM for Success, I've learned to never be afraid to combine seemingly unrelated topics in creative and unique ways. My combination of STEM and financial literacy education seemed to be a strange connection at first, but it proved to be highly successful after months of research, planning, and implementation -- so much so that the

project is potentially going to be expanded into its own future subproject within the STEM for Success program with its own funding. Making my video mini-series also reminded me of the importance of being open to learning new skills. Prior to this internship, I had never produced my own videos before. While there was a learning curve, I'm super glad I gained the experience in scripting, filming, and editing my own videos and am excited to take these skills with me into university and beyond. My project also taught me to plan, plan, and then plan some more. In designing my curriculum and the videos themselves, I found that the more and more I planned, the easier it was to make my videos and the better the videos turned out. Careful planning and forethought truly does save countless hours and eliminate unnecessary stress. And, of course, the more intentionally you plan, the more pride you'll feel upon seeing that plan come to fruition.

Advice for other internship-seeking high schoolers:

When searching for an internship opportunity, always be open to try new, and even unexpected, opportunities. Originally, I did not set out to intern for NJIT's STEM for Success program. As previously mentioned, when I first emailed Professor Bukiet, I was looking to contribute to research in the math department. If I hadn't been open-minded to other opportunities, I may have passed up on his offer to intern for the STEM for Success program. While this internship isn't what I had in mind when I first started my search, I could not be more happy with my internship experience. While you should certainly have an idea of where you want to intern, do not be afraid to adjust your game plan should other opportunities present themselves. Another key in finding an internship is to start looking early. Start looking during the summer before the school year -- the earlier the better. Cast a wide net, send personal and genuine emails to potential employers, be patient, and continue to seek out more opportunities throughout the summer to secure an internship by the fall. Most importantly, embrace the challenge! Interning in high school requires a lot of responsibility. Throughout my remote internship, I set my own schedule and deadlines, regularly checked in with my mentors, and learned how to manage my own project. The increased responsibility and independence required for a high school internship may seem daunting at first, but in the end, it's certainly worthwhile and great preparation for college, the workforce, and adult life.

Moving forward:

Interning with STEM for Success and working with Professor Bukiet and Professor Lipuma was truly rewarding and certainly one of the highlights of my high school career. Through encouraging me to design my own independent project from scratch and mentoring me as I brought that plan to life, Professor Bukiet and Professor Lipuma treated me as an equal and allowed me to take charge of my own learning. Upon their invitation, I even had the opportunity to represent the STEM for Success program at an NJIT Board of Visitors meeting, at which I spoke about the STEM for Success "STEM in Your Home" initiative and presented my independent work. As I reflect on my work, which is available to be viewed on both the STEM for Success website (www.stemforsuccess.org) and Youtube channel, I'm eager to continue developing independent projects in the future, both in and out of the classroom. Having recently graduated from the Academy in June, I'm currently on a gap year before college, through which I plan on attending a Christian gap year program and continuing to learn about finance. Having deepened my interest in finance and mathematics through my internship, I'll apply what I've learned as I strive to continue finding unique ways to help the Hispanic community. After my gap year, I'll be attending the Mendoza College of Business at the University of Notre Dame as a Mulva Scholar in the fall of 2022, where I'll study finance and continue advocating for equitable educational access for Hispanic students.

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