



NYC STEM PROPOSAL

SUBMITTED BY THE MR. OCTOBER FOUNDATION and THE STEM ACADEMY

"Building female and underrepresented minority STEM participation in New York City"

June, 2019

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“Building female and underrepresented minority STEM participation in New York City”

Organization Overview



The Mr. October Foundation for Kids (MOFK) is a California non-profit public benefit corporation, founded by Reginald M. Jackson on March 20, 1997 with the mission of improving educational opportunities for underprivileged youth. Its primary mission is to provide realistic and reachable goals for underserved communities, where children have not shown a predisposition toward academic achievement, even though they are capable of doing so. In that regard, Mr. Jackson utilizes his fame as a former major-league baseball player to gain access to a wide variety of audiences where he focuses on achievement by dedication and a desire to learn. He uses baseball as a metaphor and captures the attention of his audiences as he instills concepts like “Sports are great, but your education can help you for your entire life. Long after your legs give out, you still have your education.” With aphorisms and humanistic approaches that come from a career in sports, he has been successful at gaining attention at all levels. He counts as his successes a number of institutions that he has been able to support, ranging from a small charter school in East Palo Alto, California that will only enroll students who show promise and are willing to work (and none of whose family members received a college education) to the Detroit Public Schools, to Morehouse College and, within the last several years to Georgia Tech University’s Engineering Department. Georgia Tech successfully graduates more African-American engineers than any other higher-level institution in the U.S. With the help of its Dean, Dr. Gary May, Mr. Jackson has learned how to refine his interests from their initial beginnings of “bridging the digital divide” to a new, sophisticated program of providing STEM education to the Nation’s promising youth. Only through education can we empower children to lead more productive lives. Neither poverty nor illiteracy indicates a lack of intellect. The New Economy thrives with the perspectives brought by our Nation’s motivated youth, and STEM is the future of the New Economy. Early exposure to STEM is where the motivation begins.

Anyone who has seen the programming and dedication of the MOFK knows that Mr. Jackson has been going to bat for the Nation’s youth. He gains his energy from his spirituality, coupled with the reality of having seen thousands of young people whose lives quickly became aimless and without

purpose once they realized that they were not going to be the next great athlete, the one in 10,000 who can make it into professional sports. Mr. Jackson, now turning the ripe young age of 70, truly believes that his life will be incomplete until he can help more young people realize that their education is what will make the difference – not the distractions and influences of the street. As his father’s words continually remind him, “Ain’t nobody can take away your education, son.”



The STEM Academy, Inc. (STEM 101) is a national non-profit organization dedicated to advancing economic development by improving STEM literacy for all students.

STEM 101 provides 21st century STEM career minded curriculum and professional development to inspire, engage, and prepare students for the STEM jobs of tomorrow. Our approach is designed to improve under-represented minority and low-income student growth, close achievement gaps, decrease dropout rates, increase high school graduation rates, and improve teacher and principal effectiveness.

The STEM Academy represents a national next-generation high impact academic model that targets all schools and all students. STEM Curriculum was developed in response to the National Academy of Engineering study, “Engineering in K-12 Education: Understanding the Status and Improving the Prospects”. The meta-disciplinary, state and national standards based STEM curriculum creates student pathways for industry and post-secondary advancement. Instructor and school competencies are validated through national standard STEM instructor certification and STEM school accreditation practices.

Project Overview

Diversity is a business imperative that delivers business and social value that is tremendously important. This NYC STEM Proposal is focused on building female and under-represented minorities STEM participation.

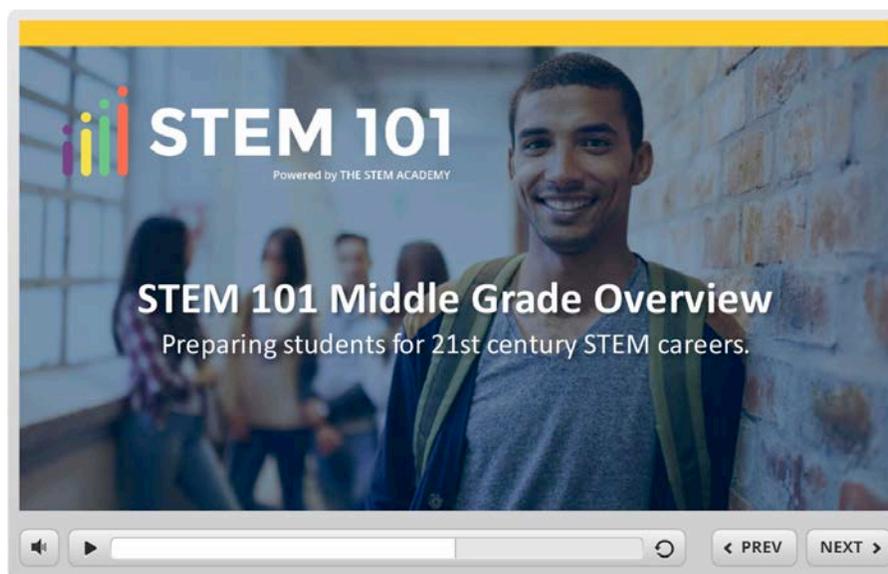
Knowledge in science, technology, engineering, and math, or (STEM), can be the key to a successful future. 80% of the fastest growing occupations in the US depend on the mastery of STEM based education, however minority students are typically not equipped to satisfy this growing need.

Provided to the schools in this program is:

- World class STEM 101 curriculum and Learning management System
- Ongoing Professional development and best practices for teachers.
- Hands on Classroom equipment and supplies for the activities and experiments
- Instructional coaches (1 per 4 schools) who work on the ground with the teachers and students in the classroom.
- Quality Assurance Manager who oversees the project, manages the instructional coaches and their schools as well as the Data Manager.
- Data Manager who supervises all research and data surrounding the program. Works with the QAM to mine data and implement improvement strategies for the field. Responsible for monthly and end of year reporting.

Please visit the site below and allow 25-30 minutes for a comprehensive and interactive presentation on the program details

<http://files.stem101.org/MS-Overview/>



Statement of Purpose

The purpose of this project is to increase the disproportionately low numbers of women and underrepresented minorities in the STEM workforce and in post-secondary programs. This work in New York City can help to close achievement gaps, decrease dropout rates, increase high school graduation rates, and improve teacher and principal effectiveness.

Population Served and how they will benefit

The STEM Academy's proven scalable model completed a pilot program in the New York City Schools in 2015 and extended that pilot into schools in 2016 (results section is below). The 2019 Program continues in the Bronx and in Oakland. The STEM Academy programming can increase the disproportionately low numbers of women and underrepresented minorities in the STEM workforce and in post secondary programs. Students across New York City can benefit by:

1. Be prepared to pursue any option after high school
2. Have an increased disposition for post secondary training/college/university
3. Have an idea of what career they will pursue when they are done with school
4. Have a higher interest in pursuing STEM careers than their peers.

How many students will directly receive services or benefits from the project? **4,000 students**

How many staff will directly receive services or benefits from the project? **14 teachers, 7 administrators**

How many staff will indirectly receive services or benefits from the project? **70 teachers**

Need and Justification

There is a shortage of STEM professionals that is expected to escalate as a result of the retiring of baby-boomers. According to the Health Education Research Institute, only 31% of all students who entered college in 2009 reported plans to major in a STEM discipline and 35% of high school seniors reported aspiring to study STEM disciplines in a post-secondary setting. In a 2009 study from the National Assessment of Educational Progress, 43% of Hispanics, 44% of American Indians and 50% of African-Americans scores “below” basic in math in the eighth grade. According to the U.S. Census Bureau, in 2008 more than 40% of children in the U.S. under the age of 5 were Hispanic, African-American or Native American.

Our countries failure to prepare underrepresented youth for STEM-related careers will greatly impact America’s capacity for global economic leadership. If we fail to develop a robust pipeline of STEM professionals containing women and those from underrepresented communities, there will be a shortage of technical innovation, lower economic growth and higher unemployment for all Americans.

Corporate Partner Benefits

Over 600,000 STEM-related technical jobs in the United States go unfilled. Preparing young people with the skills that will help meet that incredible demand will help the economy, as well as help kids find a productive career, one that clearly knows few bounds. Input from a multidisciplinary team of employers and education professionals has been invaluable in creating the STEM Academy platform that delivers the skills needed to meet the demands of the 21st century job market.

Being involved in this project goes far beyond making an investment. This STEM program has built in hundreds of skills and competencies, however three key components govern the design:

1. Creative and innovative thinking people will use and create technology and solutions that change our lives. Students in schools should be learning to be creative and innovative without boundaries.
2. Ultimately, everyone will find himself or herself seeking employment. Students should be learning the employability skills that will evolve them into desired employees.
3. There are many ways to find a solution. Students should be learning to use technology, tools, and their own knowledge to solve problems and generate new ideas.

Corporate partners could directly benefit from a capable, diverse pipeline of talented young people that have these characteristics built into their “DNA”. This program can be an integral part of the process to ensure future employees are well prepared for problems we can’t predict today.

The Corporate Connections program bridges the career awareness gap by connecting student experiences with local, regional and national companies. The program inspires students to pursue 21st century careers via corporate branded projects. STEM 101 features over 200 student projects that can introduce students to 16 career clusters, 79 career pathways and hundreds of occupations.

The Connections program can produce a capable, diverse pipeline of future employees that have built in skills and capabilities required by employers. This is an integral part of the process to ensure future employees are well prepared for problems we can’t predict today. Students and future employees are equipped for careers, college and their roles in our communities.

We partner with companies to develop exciting, real-world projects which result in effective education outreach, community relations and workforce pipeline development. Project resources are designed to inspire student pursuit of advanced STEM education opportunities and qualify adults for potential employment. Resources can be utilized for in-school, after-school, summer programs and for workforce connection services. In addition to completing a project connected to a participating company, students also learn about the culture and important role the company plays in the community. We work with state government, education and industry leaders to ensure project resources use inside of public education and workforce connection services.

Client Examples: Ainsworth, Ariens, Bank of Nevada, College of Southern Nevada, Gateway Technical College, Helix Electric, Hill Air Force Base, Keolis, Milwaukee Area Technical College, Martin Harris, Nellis Air Force Base, Now Foods, Renown Health, RTC, Trane, University Medical Center, University of Wisconsin, Valley Health Systems and WVC.

Click on the image below to tour an example project.

The screenshot shows a project page for Hill Air Force Base. At the top, there are four numbered steps: 1. DISCOVER in-demand careers connected to some of the most innovative and exciting companies in the world. 2. LEARN from virtual mentors about their pathways to career and keys to success. 3. CERTIFY you have what it takes to work in the industry by completing competency-based STEM projects designed to validate entry level career readiness. 4. Purchase Project. Below the steps is a large purple banner with the Hill Air Force Base logo and the text 'U.S. AIR FORCE DISCOVER Without question or debate our United States Air Force is the mightiest the world has ever seen. It is admired and respected by friend and foe alike and we're committed to keeping it that way. We are the 180,000 civilians who support and sustain the Air Force with our talent and our dedication—a dedication to the same mission as those in uniform—to defend our nation and protect the values that make America great. At Air Force Civilian Service we are passionate, focused, and driven by this awesome responsibility, and together with the men and women who serve, we are now and will remain a force to be reckoned with.' To the right of the text is a video player showing an F-16 fighter jet. Below the banner is a row of six virtual mentor portraits with their names and titles: Captain Timothy 'Check' Six, F-15 Instructor Pilot; Megan Jacobs, F-15 Lead Engineer; Su Bolen, Civilian Electrical Engineer; Anita M. Brown, F-16 System Design Engineer; Rubin Walker, F-35 Lead Process Engineer; and Jessica Switzer, Range Systems Computer S. Blue arrows point from external text to specific parts of the page: 'Students, educators and job seekers access competency-based project here' points to step 1; 'Students, educators and job seekers learn about in demand career pathways via virtual mentors here' points to the mentor portraits; 'Mentors, organizations or companies can easily and affordably purchase hands-on materials here' points to step 4; and 'Students, educators and jobs seekers are introduced to corporate partner here' points to the video player.

Students, educators and job seekers access competency-based project here

Students, educators and jobs seekers learn about in demand career pathways via virtual mentors here

Mentors, organizations or companies can easily and affordably purchase hands-on materials here

Students, educators and jobs seekers are introduced to corporate partner here

[Tour US AIR FORCE PROJECT](https://stem101.org/civilian-careers/) by clicking on any image above

<https://stem101.org/civilian-careers/>

Funding Commitments

The STEM Academy and Mr. October Foundation began their work with NYC schools funding the pilot in 2015. Funds were successfully raised for 2016 with programming in 4 schools in the Bronx with funding commitments from the Booth Ferris Foundation, The New York Yankees, SAP and General Electric. For 2019, the Pinkerton Foundation and the New York Yankees have again sponsored the program.



Results

In 2015, the first pilot program was completed in NYC at MS 223 in the Bronx. In 2016, 4 Bronx schools were added.

Data

- 49.4% of Bronx STEM Academy students are interested in pursuing a STEM career
 - Increase of 15.3% from 2015
 - (18.2% neutral)
 - National students interested in STEM: 23.4%

- 88.6% of Bronx STEM Academy students have an idea of what career they would like to pursue when they are done with school
 - Increase of 5.7% from 2015
 - (6.8% neutral)

- Students post-secondary training plans (multiple answers):
 - 12.5% Two-year degree
 - 34.66% Four-year degree
 - 28.41% Graduate degree
 - 15.91% Doctoral degree

**This work has the potential to increase STEM workers
by over 6,000 per year from New York City alone.**

Administrative Feedback

“We had all the classrooms running and you could tell by just listening what room STEM was happening in. There was such excitement and engagement in the STEM classrooms!”

“We have had all kinds of programs come in here and this was the first one that actually did what we expected it to. “

“All kids work together in the program here. Special education kids were working alongside Kids taking the regents exam. Here’s the thing though, you walked into that classroom and you couldn’t tell who was who. The special education kids were engaged in the work and creating awesome solutions alongside advanced academic kids. Often the special ed student’s solutions would far exceed the ones designed by the advanced academic kids. It was truly awesome!”

Vince Gassetto
Principal
Academy Of Applied Mathematics And Technology
Bronx, NY

“A group of kids randomly came to my office and asked if they would be able to do this during the school year. Spontaneous acknowledgement of a great program!”

Tyneka Harrington
Principal
Blueprint Middle School
Bronx, NY

“Everyone has agreed that the STEM Academy is 21st Century curriculum meeting the needs of students to be self-directed, responsible learners. In the digital world that our students live in, it is refreshing to find a curriculum that students can access on their time away from school. The data driven curriculum is vibrant and alive”

Ken Lake
Former Director
Lexington Technology Center
Lexington, SC

Teacher Feedback



“Kids are loving it! Thank you for bringing STEM to our school!”

Lourdes Reynoso
Teacher

Academy Of Applied Mathematics And Technology
Bronx, NY

“The STEM academy helps bridge the gap between what students learn in theory and its application. The application brings the learning experience full circle, as it is in essence what will move science forward in this nation.”

Natalie Martinez
Teacher

Academy Of Applied Mathematics And Technology
Bronx, NY



“STEM 101 stimulates students' inquiry by providing tools that allow for Science, Technology, Engineering and Mathematics connections to come to life. As a result I've seen students dare to challenge societal problems with STEM based solutions.”

Nathalie Deller
Teacher

Laboratory School of Finance and Technology
Bronx, NY



"The kids go a chance to dive right into activities and just really start to begin thinking and begin to analyze, create and prototype."

Terrence McKiernan
Teacher
Laboratory School of Finance and Technology
Bronx, NY

"These are the only courses our school has that bring together multiple departments. I have been involved with other department meetings. I have had science and math folks brainstorming ideas and working through activities in my room. Other academic teachers have used the curriculum. The flexibility and variety allows many teachers to pull from the curriculum."

Russ Hermann
Technology & Engineering Teacher
Slinger High School
Slinger, WI

"It has been the most fun I have had teaching in years. The students are excited to learn and are enjoying the process." Mount Juliet has seen three-year growth in Tennessee Value-Added Assessment scores and has narrowed the achievement gap between Hispanic and White students in math.

David Haines
Math Department Chair
Mount Juliet High School
Wilson County, TN

Leadership Feedback

"STEM 101 represents a high impact academic model for workforce development of the 21st century."

Alex Belous
Education Portfolio Manager
CISCO Systems

"Instructors from our STEM network who participated in STEM 101 instructor training were prepared to advance true STEM pedagogy which correlates to workforce development."

Dr. Sally Pardue
Director of Oakley STEM Center
Tennessee Technological University

"We are proud to support teachers in developing STEM knowledge and skills through our STEM 101 partnership. Together we are building a bridge to the future for students and our community."

Dr. Bryan Albrecht
President and CEO
Gateway Technical College
Kenosha, WI

Example Yearly Project Timeline

March 1	Funding received by MOFK/STEM101 partnership
April 1	Schools selected to participate including number of students targeted
April 15	Tentative number of students solidified
May 1	Order of Classroom Supplies and Consumables. Order of Training materials Delivery location/details (loading dock or stair carry) for each school sent to Dr. Gomez
May 15	Conference call with selected schools to discuss receiving materials procedure and PD plan
June 15	Arrival of supplies. Inventory and staging in secure area completed by staff Arrival of training materials. Inventory and staging in secure area completed by staff

June 28 Last day of school

Dates that follow adjusted based on actual calendar plans for summer

June 29-30 Teacher Orientation Training

July 10 Start of Summer program

July 11 Weekly webinar with trainer and teachers

July 18 Weekly webinar with trainer and teachers

July 25 Weekly webinar with trainer and teachers

August 1 Weekly webinar with trainer and teachers

August 8 Weekly webinar with trainer and teachers

August 9-11 Dr. Gomez visit to ensure survey and data collected from sites
Open meetings with schools/teachers about easy back to school use of curriculum
and supplies to supplement current teaching
Mapping units to regular school year topics
Iterations design of activities reviewed

August 12 Last day of summer program

August 15-19 Compilation of data and report completed

August 26 Report submitted to Funders and DOE

September 6-7 Tentative orientation PD for teachers that will be using materials in their
classrooms during the year.
2 hour blocks facilitated or half/whole day format

Ongoing Weekly webinar with trainer and teachers will continue through school year

Project Plan

Objective 1 : Train 14 teachers

Specific Activities: Train teachers from the schools who will lead classroom activities to ensure they have proficient knowledge of the systems and resources to teach students.

Persons Responsible: STEM Trainers

Metrics: Teacher pre and post surveys, self-assessments and selected unit assessments

Objective 2: Train 7 Administrators

Specific Activities: Train administrators from the schools who will supervise classroom teachers that deliver the knowledge and provided resources to teach students.

Persons Responsible: Instructional Coaches, Chris Strzok, COO STEM Academy, Quality Assurance Manager, School Administration, District Administration.

Metrics: Administrator pre and post surveys and self-assessments

Objective 3: Implement the Summer STEM program in schools

Specific Activities: Utilize summer bridge map designed by NYC Teachers and STEM Academy to execute daily and weekly activities. Retrieve and store supplies in an organized fashion to preserve future use.

Persons Responsible: School Administration, District Administration, District Teachers, Dr. Alan Gomez

Metrics: Student unit assessments, student pre and post surveys

Objective 4: Map activities and resources for regular school year use to enhance current practices

Specific Activities: Create a unit-mapping plan that assigns units to programs/teachers for the regular school year. Design plan for project iterations so that when encountered, a student has a plan for the next iteration of a design.

Persons Responsible: District Administration, District Teachers

Metrics: Completed unit map/iteration design plan

Objective 5: Gather school based data and student surveys/assessments so that profiles of participating schools can be reported

Specific Activities: Compile school data, unit assessment data and student surveys for school profile reporting

Persons Responsible: School Administration, District Administration, District Teachers, Data Manager, QAM

Metrics: Completed school profile reports including all relevant data and sorting techniques.

Project Evaluation Plan

The evaluation design will combine elements of a pre-test, post-test design, a post-test only design and a case study and will consist of both formative and summative components. The evaluation of the first three years of project implementation will be primarily formative in nature, designed to provide benchmarks regarding project progress and movement towards achieving its objectives so that appropriate mid-course corrections can be made.

The final comprehensive evaluation will be summative in nature, summarizing the project activities, reporting on the answers to the evaluation questions which will include presenting the measurable outcomes of the project and the changes that were observed. Each of these components (formative and

summative) will include process measures (milestones accomplished, participant opinions, barriers encountered, etc.) and product measures (student outcomes, professional development evaluations, etc.). The summative evaluation will investigate whether the project had the intended effects and will provide a pre-test/post-test quasi-experimental design to determine whether participation results in increased interest in STEM fields, and a pre-test/ post-test control group experimental design to determine whether participation results in an increased academic and behavioral outcome. Written evaluation reports will be prepared within 60 days of the end of each grant year with the report prepared at the end of the third year representing the comprehensive summative evaluation of the grant.

Data Collection

- Student Academic and Behavioral Measures: Schools where the programs are located to participate in a data collection program which seeks to gather and maintain longitudinal data on participating students and the other students in their district. The evaluation will also draw on the STEM Academy assessment system to provide student achievement measures in the STEM courses.
- Annual Student Survey: A student survey will draw on current, validated measures of student interest and satisfaction as noted by Alfeld (2010). The survey (without the satisfaction items) will be used as a pre-assessment for all new students and will be administered at the end of the school year to all students. The end of year survey for the last year will include questions regarding college admission and other future plans.
- Annual Teacher Survey: A teacher survey will be utilized to assess the perceived effectiveness of the professional development activities, the curriculum and elicit comments regarding strengths and weaknesses of the program.
- Annual Administrative Survey: A survey for Administrators will be administered to assess the perceived effectiveness of the professional development activities, the curriculum, and elicit comments regarding strengths and weaknesses of the program and issues that need to be addressed.
- Site Visitations: The Quality Assurance Manager/Data Manager/Chief Academic Officer will visit a randomly selected set of schools each quarter to interview staff and conduct classroom visitations utilizing data collection protocols.
- Self Assessment: A self assessment for all programs will inform and guide improvement efforts.

Evaluation Questions

1. What has been the process and progress in implementing the planned activities of the project?

Data: Project records, project staff interviews, teacher focus groups, mentor interviews, observations (e.g. professional development, classroom, etc.), curriculum reviews.

Procedure: The evaluator will maintain close contact with the project and school leadership to both collect data on project activities and to share formative results for the purpose of project improvement.

2. What have been the changes in student's interest in STEM Fields and do these changes vary by demographic category?

Data: Annual Student Survey.

Procedure: The questions pertaining to interest in STEM fields on the annual student survey will be analyzed longitudinally by cohort to determine the baseline and trends and will be broken down by demographic category within school.

3. Are students being prepared for careers in the STEM workforce of the future with industry-vetted knowledge and skills?

Data: Appropriate course completion records, student project evaluation rubrics and teacher surveys.

Procedure: This data will be analyzed at the end of the project for the senior class. Questions will be added to the teacher survey addressing this issue.

4. To what degree are students being equipped with 21st Century employability skills?

Data: Certification results, and teacher surveys.

Procedure: This data will be analyzed at the end of the project.

5. Have the goals for student enrollment including women and underrepresented minorities been met?

Data: Student enrollment data.

Procedure: For each of the years of implementation, student enrollment data will be analyzed by school.

6. What issues have arisen in attempting to implement the same model in diverse locations?
Data: Teacher surveys, Administrator surveys, Instructional Coach surveys and self-assessment Instrument.
Procedure: Items addressing the issues that either facilitated or blocked the successful implementation at each academy will be included in these surveys and interview protocols.

7. Overall, what were the factors that either facilitated or blocked the successful completion of the project activities and accomplishment of the project goals?
Data: Teacher surveys, Administrator surveys, Instructional Coach surveys
Procedure: The Quality Assurance Manager will make explicit inquiries during the last year of the project regarding these issues that will inform future project replication.

8. What were the unanticipated outcomes, lessons learned and best practices identified as a result of the project implementation activities?
Data: Teacher surveys, Administrator surveys, Instructional Coach surveys
Procedure: The Quality Assurance Manager will make explicit inquiries during the last year of the project regarding these issues that will inform future project replication.

Project Budget

The budget is comprised of the materials and hands on supplies needed to teach students in the classroom during the summer session, enhance regular school year teaching across the school building and offer after school clubs and activities. Along with the materials are the costs to teach and coach the kids, develop the corporate connection projects, film and post produce the events and oversee the work in the designated city. Included in the budget are:

- Teacher Summer salaries
- Data compilation and reporting
- Coach
- Director of Community & Government Relations
- Quality Assurance Manager
- Project Management
- Travel
- School Supplies
- Training supplies
- Connections projects
- Kids and Teacher Shirts
- Video and post production

Key Project Staff

Alan Gomez, PhD, *President, Co-Founder and Chief Academic Officer of the STEM Academy, Executive Director of the Mr. October Foundation*

Dr. Gomez is responsible for the development and continuous improvement of the STEM Academy's internationally recognized k-12 curriculum and professional development program. Also an instructor in the College of Engineering at the University of Wisconsin, Dr. Gomez has published materials in professional journals and in the Proceedings for the American Society for Engineering Education (ASEE). Dr. Gomez sat on the National Academy of Engineering's committee that is charged with "Understanding and Improving K-12 Engineering Education in the United States".

Reggie Jackson, *Founder, Mr. October Foundation*. Former Major League Athlete; Businessman; Media – On Air Talent; Car Collector; Car Restorer; (Former) Member of Various Boards of Directors in the Tech Sector; Philanthropist; Advisor to the Ownership of the New York Yankees Baseball Club; Motivational Speaker.

Christopher Strzok, M.Ed, *Chief Operations Officer*

Mr. Strzok is a former Technology and Engineering instructor and administrator from Wisconsin. While in the classroom, he was nominated and a recipient of the teaching excellence award from the Wisconsin Technology Education Association. He has presented at numerous state and national conferences and served on the national STEM panel addressing high impact, K-12 academic models, at the American Society for Engineering Education conference in Vancouver, B.C. Canada.

Quality Assurance Manager (QAM).

The quality assurance manager:

1. Reports to STEM Academy Chief Academic Officer
2. Supervises all instructional coaching personnel, directly and/or indirectly
3. Purpose: Works in developing and implementing policies, programs, curriculum activities, and budgets in a manner that promotes the educational development of each student and the professional development of each staff member.
4. General Planning: conceptualizes the broad goals of the school and plans accordingly to ensure

that procedures and schedules are implemented to carry out the total school program.

5. **General Coordination:** ensures that the school program is compatible with the financial and organizational structure of the system. The QAM defines the responsibilities and accountability of staff members and develops plans for interpreting the school program to the community.
6. **Enhancement of Personnel Skills:** provides activities which facilitate the professional growth of the instructional coaches and enhances the quality of the instructional program.
7. **Curriculum Objectives:** ensures that instructional objectives for a given subject and/or classroom are developed, and involves the faculty and others in the development of specific curricular objectives to meet the needs of the program.
8. **Establishes Formal Work Relationships:** evaluates student progress in the instructional program by means that include the maintaining of up-to-date student data. The QAM supervises and appraises the performance of the instructional coaches
9. **Facilitates Organizational Efficiency:** maintains communication and seeks assistance from central office staff to improve performance. The QAM maintains good relationships with students, staff, and parents. The QAM complies with established lines of authority.
10. **Supplies and Equipment:** manages, directs, and maintains records on the materials, supplies and equipment, which are necessary to carry out the daily school routine. The QAM involves the staff in determining priorities for instructional purposes.
11. **Services:** organizes, oversee, and provides support to the various services, supplies, material, and equipment provided to carry out the program.

Data Manager:

The Data Manager supervises all research and data surrounding the program. Works with the QAM to mine data and implement improvement strategies for the field. Responsible for monthly and end of year reporting. Reports to the Chief Academic Officer.

Essential duties & responsibilities:

- Maintain data integrity and ongoing quality control of delivered reports including reports
- Respond to and resolve database access and performance issues
- Develop and make available training materials in electronic and printed forms to their Data Users

- Assists in scheduling and coordinating the transfer of information and other electronic files to ensure compliance with reporting requirements
- Assists school-based personnel in implementing standards and operating procedures established for management of data
- Train staff members on systems & programs
- Assists in providing instruction and disseminating information to Principals and other school administrators regarding student information requirements for the operation of the student information system
- Provides assistance in all areas of student information
- Works directly with teachers in the use of the electronic gradebook system, including training and program analysis
- Provides assistance to users with the utilization of available hardware and software
- Implement and maintain network agreement per Acceptable Use Policy
- Remains current on emerging trends in technology hardware and software
- Evaluate and recommend new database technologies to QAM
- Design forms and reports related to school district databases
- Work with vendors on implementations and upgrades
- Install programs, conduct upgrades and patches and testing of programs
- Perform other responsibilities as assigned by the QAM or Chief Academic Officer

Job Knowledge, Skills, and Abilities:

- Strong understanding of database structures, theories, principles, and practices relevant to applications used in education
- Ability to instruct others in all the school's data based applications
- Strong communication and interpersonal skills
- Excellent analytical/problem-solving skills
- Excellent organizational skills with the ability to work on multiple projects and/or assignments simultaneously
- Ability to read, analyze and interpret technical documentation
- The desire to make a difference through positive attitude and enthusiasm for the job
- Commitment to the Programs Vision Plan
- Knowledge of equipment operation and fire/safety codes
- Determining the kind of tools and equipment needed to do a job

- The ability to work independently with little or no supervision
- The ability to understand and carry out detailed written and oral instructions
- The ability to communicate courteously, efficiently and effectively with a variety of individuals, including students, staff, administrators, parents and representatives of outside organizations
- The ability to work cooperatively and effectively with peers, supervisors, parents and outside agencies
- The ability to be dependable, punctual, and to take the initiative

Tools/technology requirements:

- Hard disk drives, Desktop computers, Notebook computers, Access software, Information retrieval or search software, Data base user interface and query software, Object oriented data base management software, Operating system software, Word processing software, Application server software, Spreadsheet software, Presentation software, Data base reporting software, Data base management system software

Desired qualifications:

- A college degree in Computer Science preferred, or a combination of education and experience from which comparable knowledge and skills are acquired
- Valid Drivers License

Working conditions:

- Regular exposure to airborne particles (including dirt & dust)
- Regular operation of various computers and servers
- Direct responsibility for work output of other people
- Ability to meet multiple demands from several people
- Occasionally exposed to outside weather conditions
- Regularly exposed to cold/heat, risk of electrical shock
- Noise level is moderate

Instructional Coach (1).

Purpose: The Instructional Coach, having both content and instructional expertise, will work as a colleague with classroom teachers to support student learning and teacher practice. The Instructional Coach will focus on individual and group professional learning that will expand and refine the understanding about researched-base effective instruction for teachers. In order to meet this purpose, the Instructional Coach will provide personalized, 1:1 support based on the goals and identified needs of individual teachers.

Responsible to: Quality Assurance Manager

Essential Functions:

- 1) Support the philosophy and vision of the STEM program and local school district.
- 2) Facilitate the intellectual and professional development of teachers with a focus on improving student achievement.
- 3) Create positive relationships with teachers and administrators.
- 4) Communicate and demonstrate researched-based instructional practices that result in increased student performance.
- 5) React to change productively and handle other tasks as assigned.
- 6) Provide individualized, classroom-based coaching with participants to support them in implementing good instructional practices.

General Responsibilities:

- 1) Demonstrate willingness to assume leadership positions.
- 2) Provide organized, individual and/or group learning opportunities for teachers as needed.
- 3) Provide support in analyzing student assessment data.
- 4) Assist teachers with instructional decisions based on assessment data when requested.
- 5) Assist teachers with specific classroom activities when requested.
- 6) Provide support for classroom motivation and management strategies.
- 7) Assist teachers in creating materials that are in alignment with curriculum.
- 8) Provide teachers resources related to instruction and curriculum.
- 9) Provide assistance in researching instructional and/or curriculum issues.
- 10) Model effective, differentiated instruction when requested.
- 11) Provide encouragement and emotional support to teachers.

- 12) Encourage ongoing professional growth for all teachers.
- 13) Manage time and schedule flexibility to maximize teacher schedules and learning.
- 14) Work positively toward meeting identified district and building improvement goals.
- 15) Assist with development of program curriculum, instruction and assessments.
- 16) Develop and maintain a confidential, collegial relationship with teachers.
- 17) Possess an understanding of when to contact administrators regarding issues of safety/ethics.
- 18) Perform duties as assigned by the Quality Assurance Manager and Chief Academic Officer.
- 19) Participate fully in professional development for coaches, including peer observations, professional research and reading, and inquiry sessions.
- 20) Assist teachers in aligning their teaching with appropriate standards, curriculum and assessments.
- 21) Work collaboratively and collegially with other Instructional Coaches, curriculum specialists and district specialists.

Personal Skills:

- 1) The ability to work effectively with adult learners
- 2) The ability to skillfully offer constructive feedback to facilitate change
- 3) The ability to be flexible, open and willing to implement new ideas in the classroom
- 4) The ability to organize and prioritize responsibilities, projects and tasks
- 5) The ability to work and contribute to a team
- 6) The ability to seek resources and solutions to effectively solve problems

Frequently Asked Questions

Target audience

Q: Where are schools, how are they selected?

A: The schools in the 2019 NYC STEM Program were selected from Community School District 7 in Bronx, NY. Schools are selected based on their willingness to participate, their population of ELL and underrepresented students as well as their ranking on NYC school report cards. Schools with higher grades on their report cards are more likely to have a solid leadership and support structure already built into their school. For the 2018 program, applications will be accepted from across NYC, with an emphasis still remaining on the Bronx.

Q: What age groups will be impacted? (elementary, middle, high?)

A: Middle Schools have been selected to participate in the program, building their Summer STEM program first, then transitioning into their regular school year program and after school activities.

Q: Why NYC? Why not other states?

A: New York City Schools, in particular schools in the Bronx were selected as the initial area of implementation through the partnership with the Mr. October Foundation. The proposal is focused on building female and under-represented minorities STEM participation. The Bronx represents the poorest congressional district in the United States and has very diverse schools with English Language Learner needs. Because of these factors it made sense to start in the Bronx. The program is scalable and has been vetted by the Oakland Unified School District for their program since the summer of 2017.

Currently, STEM Academy programming is being used in over 42 states in the USA, India, Bermuda and Mexico/China in 2020.

Program elements

Q: What is being delivered with this initiative?

A: Curriculum, Supplies, Coaches and Oversight.

Curriculum and Supplies:

The STEM Academy (STEM101) curriculum is built on a blended learning, project-based platform, which is accessible through any Web-enabled device. The curriculum is based on national standards and features correlation to individual state standards. Flexible use curriculum design advances a meta-disciplinary STEM education pedagogy through which all faculty and students are engaged. The curriculum has hands on experiments and lessons that do require supplies be purchased. A portion of the funding provides these resources for the schools.

This curriculum content is being utilized in the schools to enhance and complement what is currently being taught in many different courses. This ensures that it can be utilized in as many different classrooms as possible, thus further extending the reach of the project beyond the primary impacted students.

Instructional Coaches and Oversight:

The program beyond the summer months will need oversight and coaches assigned to the schools.

- **Coaches:** Each of the 4 schools will need a paid Instructor Coach to be in the classrooms for the school year at various times. The Instructional Coach, having both content and instructional expertise, will work as a colleague with classroom teachers to support student learning and teacher practice. The Instructional Coach will focus on individual and group professional learning that will expand and refine the understanding about researched-base effective instruction for teachers. In order to meet this purpose, the Instructional Coach will provide personalized, 1:1 support based on the goals and identified needs of individual teachers. Additional Coaching responsibilities are outlined in the full program proposal.

- Quality Assurance Manager (QAM): Supervises all instructional coaching personnel, directly and/or indirectly. Works in developing and implementing policies, programs, curriculum activities, and budgets in a manner that promotes the educational development of each student and the professional development of each staff member. Additional QAM responsibilities are outlined in the full program proposal.
- Director of Community and Government Relations (DCGR): provides collaborative leadership in the establishment and maintaining strategic relationships with elected officials, government agencies, and nonprofit/community/business organizations to advance the programs educational mission. The DCGR leads broad-based advocacy at the local, regional, state, and federal level to establish partnerships, establish and grow funding streams, and demonstrates the organizations thought leadership. The DCGR communicates and collaborates with program leadership and colleagues to identify funding needs and partnership opportunities.
- Data Manager: Supervises all research and data surrounding the program. Works with the QAM to mine data and implement improvement strategies for the field. Responsible for monthly and end of year reporting.

Q: What is meant by training the administrators?

A: Administrators (principals or assistant principal) of the schools are part of the process and will be part of an exclusive training session that is focused on their leadership responsibilities as part of the project. Only one administrator from the awarded school is required to attend the training session.

Q: In terms of “Implementing the Summer Bridge program: is this a brand new Bridge program? Or are you improving an existing one?”

A: In NYC, the Summer Bridge program was an existing program, however STEM was woven into it. In Oakland, The summer STEM programming is new, however summer classes have been run in Oakland for many years.

The existing programming infrastructure ensures limited or no investment from outside funding to create such an infrastructure and that the framework behind the program supports the Summer STEM programs existence. Some schools require every student to attend the summer program and some schools provide the program as an option to students. These programs are provided at the student's home schools or in conjunction with a school near their home school. Currently there are no stipends designed into the funding for students, however the STEM Academy and Mr. October Foundation for Kids is interested in this process and its viability. Students, teachers and funders will be celebrated at an event near the end of the summer program or in the fall of a new school year.

Delivery and execution

Q: Who is actually leading the initiative?

A: The STEM Academy (STEM101) and the Mr. October Foundation for Kids (MOF) are working in partnership to present the STEM program to the schools. Dr. Gomez is the Academic lead of the programming.

Q: How did STEM Academy and Mr. October come into partnership?

A: STEM 101 was vetted by MOFK in 2014 as the leading scalable STEM program designed for all kids in schools. STEM 101 and MOFK have been working ever since 2014 to bring programming to schools.

Q: Can STEM ACADEMY share best practices and results for their curriculum in practice?

A: The STEM Academy has archived best practices and training videos available to all teachers in the Teaching Resource Course located on the Learning Management System. A world-class virtual orientation course has also been launched which culminates in teacher certification. Ongoing professional development webinars occur weekly during the school year and all teachers are encouraged to attend the live sessions or view the archived videos. Longitudinal data for nationwide students is available and will be provided to funders.

Q: What is expected/required of the partners?

A: Partners in the project will provide funding to support the elements of the programming and are encouraged to share their ideas about the content and direction of the programming as well as scalable cities that may benefit from this program. Additional participation in the corporate connections program is available to high-level funders. The corporate connections program brings branded, business relevant projects into the classroom curriculum so students have an experience related to the funder's business practice. This begins the process of having students more interested in real world projects related to companies and the jobs that they one day may be holding.

Q: What happens to the support which has been given to the schools/teachers after 3 years?

A: Sustainability is a practice that STEM101 and MOFK believe in. This program has been designed to kickstart the STEM cultural change at the schools to build female and under-represented minorities in STEM. After three years, the design of the program is to have the school take over the financial and leadership responsibilities. After three years, student data associated with the end of year report and any data consultant fees, summer teacher salaries and project consumable expenses would be the responsibility of the school or school district. The STEM Academy intends to continue to grant the curriculum to the schools beyond the first three years.

Q: What about long-term measurement or evaluation of effectiveness after 3 years?

A: Included in the long-term commitment is the administration of surveys to students from the STEM Academy academic team that would be part of the end of year report assembled by the school leadership team.

STEM101/MOFK Program References

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