



Proposal for Program Expansion

The Long-Term Solution for the Dayton Regions
Manufacturing Workforce Shortage

Submitted by:

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Proposal Overview

XtremeSTEM, an established workforce development non-profit, is looking to expand its reach to grow the pipeline for high paying STEM careers in our region. XtremeSTEM has proven and effective tools for growing the regional manufacturing workforce pipeline, contributing significantly to the region's workforce development goals.

XtremeSTEM has solved the workforce development crisis. We are a proven solution and with your help, we can grow our efforts and make a major impact on our region. The majority of the desired funding will go directly to establishing and building XtremeSTEM student programs in middle schools and high schools in our region, engaging up to 3,725 students.

This 3-year program expansion will commence as soon as funding is received. In the middle of the third year, this effort will be evaluated for effectiveness and a new proposal will be submitted to obtain funding the next expansion phase.

The Manufacturing Workforce Shortage

The U.S. Chamber of Commerce - in [this report](#) on the U.S. labor shortage – states that, right now, even if every unemployed person with experience in the advanced manufacturing industry were employed today, the industry could fill only 75% of vacant jobs.

The next seven years do not look any better. A [2021 study](#) by Deloitte & The Manufacturing Institute shows that by 2030 (when today's 6th graders graduate), manufacturers will need to fill 4 million jobs; 2.1 million of which could go unfilled. That means that for every 100 open manufacturing jobs in the United States, there will be only 53 people looking for them.

We believe that the long-term solution to this workforce shortage crisis is to inspire more young people to pursue advanced manufacturing careers after graduation. That is what XtremeSTEM does.

Early Student Engagement Is Key

There are a lot of great programs out there, but they are all struggling with ways to effectively engage students and develop a pipeline of potential students into the manufacturing industry. To be effective, we need to communicate regularly with students and their parents early-on when they are still interested in learning about a wide variety of career options.

With the XtremeSTEM model, we introduce basic industry concepts to students early in middle school, when they are developing their interests and hobbies. We have learned that the earlier we engage the student and his/her parents, the more likely a given student is to be interested in an advanced manufacturing industry career after graduation.

XtremeSTEM – A Proven Solution

XtremeSTEM is an Ohio-based non-profit organization (501c3) leading the way in eliminating Ohio's manufacturing workforce crisis through proven, results-oriented solutions. It is our mission to inspire students to pursue STEM careers in advanced manufacturing. Using experiential student programs, we effectively dispel the myths and misconceptions about the industry, showing the next generation that the manufacturing industry is not dark, dying, or dangerous - it is full of opportunity.

Since our founding ten years ago, we have worked with over 3,500 students from 60 Southwest Ohio schools, hosting 19 regional competitions with over 1,000 student-built robots. Our impact goes beyond just the students. With an average event attendance of approximately 1,000 parents, teachers, and robotics enthusiasts, XtremeSTEM has given tens of thousands of community members unique insights into the world of advanced manufacturing.

The best part is that XtremeSTEM is very cost effective with very low ongoing costs. The program was developed and proven out here in Dayton to allow schools to have fun, hands on STEM activities at low costs to the schools.

Our process is simple:

We **ENGAGE** middle and high school students, introducing them to STEM and its role in advanced manufacturing through fun, hands-on programs like XtremeBOTS.

We **EDUCATE** students, teaching important skills like leadership, teamwork, problem solving, and crisis management, as well as introducing elementary concepts of design, engineering, manufacturing, and assembly.

We **EQUIP** each student, giving them a broad understanding of the scope and importance of the advanced manufacturing industry and providing them with a clear pathway to the many in-demand, high-paying career opportunities that it offers.

Interviews with graduating seniors have shown that approximately 60% of our program participants intend to pursue an advanced manufacturing or engineering career. XtremeSTEM programs are not just fun, they create a real workforce pipeline into the advanced manufacturing industry. It is time to expand this effort and bring a long-term solution to Ohio's manufacturing workforce shortage.

Program Expansion throughout the Dayton Region

The goal is to establish XtremeSTEM programs in 70 different high schools and middle schools throughout the entire Dayton Region involving over 3,725 students!

XtremeSTEM will provide everything needed for the schools to successfully launch their programs. Those programs include:

Program	Description
XtremeMICROBOTS	1lb battling bots for middle school and high school teams
XtremeMINIBOTS	3lb battling bots for middle school and high school teams
XtremeBOTS	15lb battling bots for high school teams
XtremeDRONES	"In-the-air" Drone Soccer for middle school teams (HS program in development)
At-event programs:	
Xtreme3D	Walk-up 3D printing challenge for event attendees
XtremeCHALLENGE	Instant engineering challenges for competing teams

Launching in the schools:

Schools would submit applications to XtremeSTEM to receive the funding and launch the XtremeSTEM programs in their school (at no cost to the school). Each school would commit to running the programs for a minimum of 3 years. From the applications received, XtremeSTEM would choose the following:

- 25 different middle schools to start an XtremeMICROBOTS program (1lb plastic bodied bots)
 - 25 bots per school (2 students per bot = 50 students per school)
 - Each school receives one 3D printer as part of the program
- 15 different high schools to start an XtremeMINIBOTS program (3lb metal bodied bots)
 - 50 MINIBOTS per school (2 student per bot = 100 students per school)
 - Each school will be teamed up with local manufacturers to help make parts
- 15 different high schools to start an XtremeBOTS program (15lb metal bodied bots)
 - 3 XtremeBOTS per school (5 students per team = 15 students per school)
 - Each school will be teamed up with a local manufacturer to help make parts
- 15 different middle schools to start an XtremeDRONES soccer program (plastic bodied drones)
 - 25 drones per school (2 students per drone = 50 students per school)
 - Each school receives one free 3D printer as part of the program

XtremeSTEM will provide each school the following:

- Expertise on how to launch programs
 - Supplies needed, where to begin
 - Experts who've "been there, done that" holding regional training days
- Expertise on how to run
 - Arenas, software programs, signage, all supplies needed
- On-call support as needed
- Marketing materials / use of XtremeSTEM / XtremeBOTS / Drone Soccer logos

- Membership in the XtremeSTEM Competition League
 - A place for each team to advance after placing in the regional completion
- Career pathways information

Funding Request and Program Costs

We are requesting help to secure funding to establish and support XtremeSTEM in 70 different high schools and middle schools at no cost to the school.

Requested funding summary:

Funding Item	Amount
Fifteen new XtremeDRONES soccer programs (includes 3D printers) in middle schools	\$195,750
Twenty Five new XtremeMICROBOTS programs in middle schools	\$140,000
Fifteen new XtremeMINIBOTS programs in middle schools and high schools	\$97,500
Fifteen new XtremeBOTS programs in high schools	\$111,000
10 new 3D printers for Xtreme3D program at each competition (4 per ISP)	\$25,000
XtremeSTEM administration including: Full-time director; ISP Chapter development and support; Training for program mentors and coaches; Rental of convention type center for competition event; and Misc. expenses	\$300,000
Total	\$869,250

XtremeSTEM will fund the program for three years in each school. After year three, ongoing costs for all our programs have an extremely low cost per student.

Annual ongoing costs to the school (after year one):

- 15 different middle schools to continue a drone soccer program (plastic bodied drones)
 - 25 drones per school = 50 kids per school = 200 students total in regional program
 - Total ongoing costs per school is \$750 for all 25 drones (*\$15 per student*)
- 25 different middle schools to continue a 1lb MICROBOTS program (plastic bodied bots)
 - 25 bots per school = 50 kids per school = 500 students total in regional program
 - Total ongoing costs per school is \$750 for all 25 bots (*\$15 per student*)

- 15 different high schools to continue a 3lb MINIBOTS program (metal bodied bots)
 - 50 MINIBOTS per school = 100 kids per school = 500 students total in regional program
 - Total ongoing costs per school is \$2,500 for all 50 bots (*\$25 per student*)
- 15 different high schools to continue a 15lb XtremeBOTS program (metal bodied bots)
 - 3 XtremeBOTS per school = 15 kids per school = 150 students total in regional program
 - Total ongoing costs per school is \$750 for all 3 bots (*\$50 per student*)

Summary

XtremeSTEM stands ready to bring a proven, long-term solution to Ohio's growing manufacturing workforce shortage. With proper funding, over the next three years, we will establish and build successful XtremeSTEM Chapters, adding thousands of middle school and high school students into the Dayton Regions advanced manufacturing workforce pipeline.

We have commitments for the additional funds needed to operate the program and have been working with the Braxton Miller Foundation (BMF) and other private donors to secure this funding. We have partnered with BMF to launch XtremeSTEM with an initial focus on repressed areas of the Dayton Region. Additional funds will be raised by sponsorships and booth sales at the events.

Let's get to work!

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To further the conversation, please contact Steve Staub at and visit www.XtremeSTEM.org.



Re: Xtreme STEM support

As you may be aware, in some Ohio communities, only 72% of students will graduate high school and, of those who will graduate, 89% of those students won't be going to college and don't have any idea what they're going to do next. That's thousands of young people every year who are stepping into adulthood at an elevated risk of poverty, homelessness, and illegal behaviors, which can devastate their lives and break down their communities.

At the Braxton Miller Foundation we're working hard to turn this situation around by getting kids engaged in school programs that keep them off the street, teach them valuable skills, and prepare them to confidently enter the workforce. These empowered kids will be able to have successful careers.

That's why we really appreciate the work of XtremeSTEM. In that last ten years they have introduced thousands of Ohio middle school and high school students to the joys of making things and the opportunities available to them in manufacturing-related careers.

Last year we became a financial supporter of XtremeSTEM and I hope that you'll consider supporting them too. The attached information sheet gives you a few more specifics about what Xtreme STEM does and who they serve.

Once you review that information, I'd be happy to talk with you about why we've chosen to partner with them. And I can get you connected directly with Steve Staub, the president of XtremeSTEM. I think you'll sense Steve's genuine passion for this cause and you'll appreciate his successful record of bringing people together to get things done.

Kind regards,

Lashonda Miller
Chief Executive Office
The Braxton Miller Foundation

Braxton Miller Foundation (a 501(c)(3) organization) believes in the potential in every child. We empower tomorrow's leaders through education, sports and mentoring.