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MakerMinded Online STEM Education Student Competition Goes Live in Detroit

Platform and Competition are Igniting Advanced Manufacturing Learning Across Detroit Public Schools

January 29, Detroit, MI—Today, LIFT—Lightweight Innovations for Tomorrow, a national Manufacturing USA institute, in partnership with Detroit Public Schools Community District and Tennessee Tech University's iCube, launched MakerMinded, an online Science, Technology, Engineering and Math (STEM) learning and educational activity platform for Detroit middle and high school students.

The MakerMinded platform impassions and educates students about advanced manufacturing and provides them with transformational STEM learning experiences and skills that set them on track towards advanced manufacturing careers.

MakerMinded's online platform, www.MI.makerminded.com, will connect Detroit's middle and high school students to hundreds of leading-edge STEM and advanced manufacturing education experiences, while linking them to the national student-driven MakerMinded campaign. The platform's goal is to provide students access to the right programs that will encourage and prepare them for further education and careers in advanced manufacturing while recognizing students' achievements in STEM and career and technical learning.

"Manufacturers across the country fear a widening skills gap, which could result in 2 million jobs going unfilled unless we take action now to prepare today's students for tomorrow's jobs," said Emily DeRocco, director, education and workforce, LIFT. "MakerMinded shows the magic that happens when we empower young people with the opportunities, inspiration, and tools they need to gain in-demand skills and pursue meaningful careers."

This year's goal is to sign on 50 schools across the Detroit Public School Community District and award the top performing schools for their engagement in MakerMinded advanced manufacturing programs in May 2018.

"Our partnership with LIFT aligns to our mission to strengthen Detroit's public schools and our priority to improve the whole child while increasing student achievement," said Alycia Meriweather, DPSCD, Deputy Superintendent. "MakerMinded will provide a platform for hands-on, real-world skills, unique experiences and confidence students need to thrive in our city, our nation, and our world, and become tomorrow's advanced manufacturing leaders."

How it Works

The platform includes a searchable database of both national and local student programs, including on-line and in-person experiences, from manufacturing facility tours to engineering design challenges to technical skills competitions. As students complete activities and programs, schools receive points and compete against other schools in Detroit. The competition culminates in a recognition event and prizes for the schools accumulating the most points for completing the most activities.

To officially launch MakerMinded, 150 students from middle and high schools across the city will gather at LIFT Headquarters to tour the new high bay facility—which includes \$50 million in manufacturing technology and equipment—interact with engineers, and learn about 21st century opportunities in advanced manufacturing.

Students, teachers and schools interested in joining the MakerMinded campaign can sign up at: <http://ML.makerminded.com/>

About LIFT – Lightweight Innovations for Tomorrow

LIFT, operated by the American Lightweight Materials Manufacturing Innovation Institute (ALMMII), is a Detroit-based, public-private partnership committed to the development and deployment of advanced lightweight metal manufacturing technologies, and implementing education and training initiatives to better prepare the workforce today and in the future. LIFT is one of the founding institutes of [Manufacturing USA](#), and is funded in part by the Department of Defense with management through the Office of Naval Research.

About iCube

Tennessee Tech University's iCube is a place where students and faculty Imagine, Inspire, and Innovate. We are a leader in advancing collaborative solutions with extensive experience in public policy marketing campaigns and virtual reality development. To learn more about our center, please visit www.ttuicube.com.

BUILDING 21st CENTURY MANUFACTURING TALENT

Leading a MakerMinded Vision in Detroit

Connecting the next generation of manufacturers and business leaders to the skills and experiences they need to be successful and to the companies that need their talents



PROBLEM ONE: Innovation Demands Talent

Employer demand for skilled workers is rapidly increasing, yet current workers are not prepared to fill these jobs and students are not pursuing the STEM education and training that would prepare them for a career in manufacturing.

For the U.S. to become the world leader in advanced manufacturing – particularly lightweight metals manufacturing – an educated and skilled workforce is necessary to use the new manufacturing technologies and processes being developed.

PROBLEM TWO: Students Leaving STEM Behind

In eighth grade, students start considering careers, and these considerations become clearer through high school. By the time they are seniors, however, only 16 percent are proficient in mathematics and interested in a STEM-related (Science, Technology, Engineering, Math) career. Students are less engaged in STEM training, with fewer selecting college majors in STEM fields, making it even more difficult to encourage a career in advanced manufacturing once they reach high school and college age.

Roughly 28 percent of Bachelor's degree students enter a STEM field at some point during their postsecondary education. Nearly half of those students, however, leave STEM by either changing majors or leaving college completely, creating an even larger gap in the trained workforce.

The small share of students entering STEM fields displays the lack of preparation for those careers. For manufacturers, this "disconnect" between students gaining the foundational STEM skills and the educated, skilled, and ready workforce our manufacturers need must be a national priority.

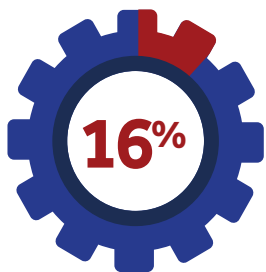
PROBLEM THREE: Jobs Are Being Left Unfilled

Over the next decade, nearly 3.5 million manufacturing jobs in the United States likely need to be filled. Pending retirements coupled with a declining flow of new workers and an increasing need for talent have created a large skills gap resulting in predictions that two million of those jobs will remain unfilled.

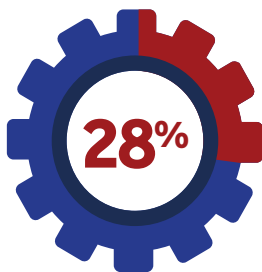
Employers seeking advanced manufacturing workers in the 5-state LIFT region posted over 67,000 online job ads during Q4 2017, including more than 27,300 jobs posted in Michigan alone, up 36 percent from Q1 2013. Building the pipeline of talent necessary to fill these jobs demands more solutions to prepare students and new workers with necessary STEM knowledge and skills.

MORE AWARENESS AND ACCESS ARE NEEDED

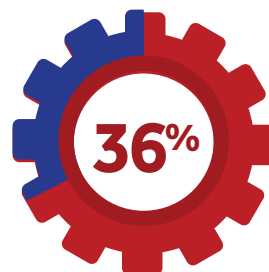
Numerous world-class initiatives are addressing the serious and growing disconnect between America's youth and the STEM knowledge and skills required to succeed in the new and exciting advanced manufacturing jobs. The challenge is awareness and access, with too few students, parents, and educators learning and sharing information about the programs and how to better engage young people in activities that connect them to the world of STEM. LIFT and its partners believe a recently developed initiative will help address this challenge.



of senior year high school students are proficient in mathematics and interested in STEM



of Bachelor's degree students enter a STEM field at some point during their postsecondary education, but nearly half leave



increase of advanced manufacturing employer job demand in Michigan since Q1 2013

THE SOLUTION

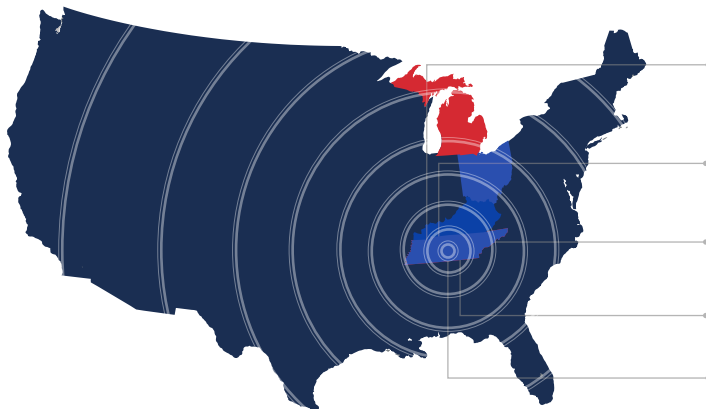
CHANGING MINDSETS AND INCENTIVIZING STUDENTS AND SCHOOLS TO TAKE ACTION IN STEM EDUCATION

The MakerMinded web portal, designed by Tennessee Tech University, brings together actionable information, the power of competition and campaign communications to saturate the learning infrastructure with a manufacturing mindset to bridge the gap between activities and programs that engage and educate youth and the students who can take advantage of them. The solution delivers a diverse portfolio of successful STEM awareness and education activities to schools and students in a simple, accessible platform including both national and local-level STEM and manufacturing career exploration activities, project-based learning, formal educational resources, and other experiential learning opportunities.

MakerMinded was founded on four core principles that not only change attitudes about STEM and manufacturing, but also drive students and schools to act.

- **Campaign-style communications**
All students and schools work towards a common goal—building awareness and engagement in STEM
- **The power of competition**
Schools compete for points acquired for completing activities, which builds community, unites disconnected students, and empowers all stakeholders
- **Student-driven programs**
Students and schools own STEM activities
- **Leveraging, not reinventing, successful activities**
MakerMinded brings to scale impactful programs and saturates the marketplace with STEM.

EXPECTED OUTCOMES



- Changed perceptions and broadened understanding among students regarding manufacturing
- More students engaged in STEM/manufacturing learning experiences
- An increase in students pursuing further STEM education and training
- More opportunities for students to develop foundational technical skills
- Increased number of under-represented populations exposed to manufacturing and STEM fields

HOW IT WORKS

The portfolio provides students with alternative options to gain foundational STEM/manufacturing skills emphasizing work-based, project-based and problem-based learning. Other key components include using cutting-edge technology, relevant “real-world” content, and industry partnerships that provide mentorship, subject matter expertise, and other learning experiences.

The programs and activities encouraged via MakerMinded provide students with a comprehensive array of foundational, technical and employability skills and essential experiences core to understanding and being prepared for STEM/manufacturing careers.

SAMPLE ACTIVITIES IN THE MAKERMINDED PORTFOLIO

A few examples of the over 100 STEM and manufacturing activities in the MakerMinded portfolio are:

- [FIRST Robotics](#)
- [Learning Blade](#)
- [SkillsUSA](#)
- [Science Olympiad](#)
- [Destination ImagiNation](#)
- [Manufacturing Plant Tours](#)
- [Local STEM Career Days](#)
- [MATHCOUNTS](#)
- [LIFT Virtual Reality Simulation](#)
- [Science and Engineering Fairs](#)

ALIGNMENT TO LIFT WORKFORCE & EDUCATION GOALS



Attracting students and workers to educational pathways and careers in manufacturing



Ensuring students gain STEM foundational skills for success in manufacturing



Linking & leveraging resources and related initiatives on the ground today

Potential to reach over 3,800 middle and high schools and 5.9 million students across the 5-state LIFT region.

ABOUT THE PROJECT

MakerMinded will have a national scope with a continuing roll-out, starting in Tennessee, rolling out in Kentucky and Ohio, and now to Detroit..



Detroit Public Schools Community District will drive the Detroit roll-out process. Rollout will include:

- Customizing the portfolio programs for local employers and organizations
- Leading the citywide communications & marketing efforts for program implementation
- Tracking progress for each school and the city
- Sponsoring and co-hosting a recognition event

The Tennessee Tech University team will manage the MakerMinded platform and Detroit-specific portal, including:

- Developing and hosting the custom web portal for Detroit's program
- Managing the leader board and reports
- Ensuring consistent platform functionality

LAUNCH AND EVALUATION IN DETROIT

Detroit Public Schools Community District will drive the Detroit roll-out process. Rollout will include:

Winter
2018

Roll-out and implementation

- Goal to get 50 middle and high schools signed-up and active on the platform.

June
2018

June 2018 – Year one results report

Metrics to be collected:

- Schools activated and engaged in the MakerMinded platform
- Activities/programs completed by students (at school, county, and state-levels)
- Percentage of students who indicate interest in pursuing further STEM/manufacturing education and careers (through participation surveys)
- Real-time feedback of students' experiences with programs and activities
- Reported completion point variance in schools, to determine areas of strength and weakness
- Manufacturing industry awareness and interest as demonstrated in STEM surveys pre- vs. post-implementation
- Number of rural and at-risk schools that participate in the program