Bridging the Attraction Gap: A STEM Partnership that Gets Results

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Partnering to Bridge the Attraction Gap in STEM - About Us

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Overview

• Identify the issues: WHY
• Find a Solution: WHAT
• Determine a Time: WHEN
• Identify a Place: WHERE
• Define the Need: WHO
• Pull it Off: HOW
Identify the Issues: WHY

• The “Attraction Gap”
• What is it?
• When does it start?
Identify the Issues: WHY

• Immediate & projected shortage in STEM workers

• Trades & manufacturing shortage

• Not enough college-ready students

Data according to U.S. Department of Education
Out of 100 Michigan 9th grade students...

73 graduate high school on time...

45 enroll in postsecondary education within 12 months of graduation...

32 persist from their 1st to 2nd year...

18 graduate with a degree within 6 years...
Identify the Issues: WHY

- One million fewer STEM graduates than U.S. industries will need over next decade according to 2013 report by President’s Council of Advisors on Science & Technology (PCAST).
Find a Solution: WHAT

“Break-through content on innovation and partnerships that prepare students to become successful STEM professionals in tomorrow’s economy.”
PROJECTED PERCENTAGE INCREASES IN STEM JOBS: 2010-2020

- All Occupations: 14%
- Mathematics: 16%
- Computer Systems Analysts: 22%
- Systems Software Developers: 32%
- Medical Scientists: 36%
- Biomedical Engineers: 62%
Find a Solution: WHAT

Federal STEM strategic plan goals:

#2 → Increase & Sustain Youth & Public Engagement in STEM
Find a Solution: WHAT

• Create the SPARK

• Bring the “WOW” of STEM to life for K-12 students! (and their families!) - Hands-on

• Highlight existing industry and community STEM-related programs

• Show the path to success
Determine a Time: WHEN

- During the school day
- Early fall to excite for the year
- Spring for a “capstone” event
Identify a Place: WHERE

- Local Higher Ed site to show post-HS opportunities
- Central location – convenient for busing
- A gymnasium and nearby hallways
Define the Need: WHO

• 31% of high school freshmen report an interest in STEM

• 16% of all high school seniors are proficient in math and interested in STEM careers

• Of those pursuing college, less than 40% complete a STEM degree

Data according to U.S. Department of Education
Define the Need: WHO

Underrepresented minorities in STEM:

• ~40% of K-12 students,

BUT...

• Only 27% of associate’s degrees

• 17% of B.S. degrees in sciences & engineering

• 6.6% of doctorates in those fields
Deficit of women in STEM:

- ~½ of workforce, BUT...
- < 25% of STEM jobs
- < 1 in 5 bachelor’s degrees in high growth fields like computer science & engineering
Enter: The Michigan Tech Center for Pre-College Outreach

- Established in 1972
- On and off campus K-12 outreach
- Summer programs for middle/high school students to explore STEM
- College access programs (i.e. GEAR UP)
Established in 2010
Pull It Off: HOW - Festivals

• Over 100 engaging quick hands-on STEM based activities
• Undergrad & grad students, faculty/staff from Michigan Tech & host school
• Intro to science behind activities
Pull It Off: HOW - Trekkers

• Undergraduate or graduate students who facilitate “A-HA!” moments, helping K-12 students bridge the attraction gap.
• Serve as “near-peer mentors” & role models.
Pull It Off: HOW – “A-Ha!”

The power of ‘The Moment’!
When a student’s sense of inquiry is ignited!

“WHY?!”
Followed by “A-HA!”
What is the Goal?

- Get excited about STEM topics first-hand!
- Meet STEM professionals
- Explore after school & post-high school options
- Show importance of STEM education
Pull It Off: HOW - An Example

Delta College
STEM Festival

What can YOU do in YOUR area?

https://www.youtube.com/watch?v=cKnYAcSgc6Y
Hands-on demonstrations bring the WOW of STEM to life!

Powered By:

www.mindtrekkers@mtu.edu

Presented By:
Pull It Off: HOW – Career Connections

- Career connections to local businesses, manufacturers, and corporations
- Work with STEM professionals
- Engage in an informal environment
- Learn about STEM jobs
Pull It Off: HOW – Keep interest

- Area Colleges & Universities
- Outreach programs
- After school programs
- Clubs & more…
- Showcase their programs
- Answer college questions

- Clubs & Education Options
- How to maintain interest?
<table>
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<td>32</td>
<td>32 + waitlist</td>
</tr>
<tr>
<td>Friday students</td>
<td>2751</td>
<td>3556 (↑29%)</td>
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<tr>
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<td>~1000</td>
<td>~1500+</td>
</tr>
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<td>Mind Trekkers</td>
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<tr>
<td>Delta volunteers</td>
<td>81</td>
<td>&gt;140 + more</td>
</tr>
<tr>
<td>faculty &amp; Depts</td>
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<tr>
<td>Partners</td>
<td>~33</td>
<td>~29</td>
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Pull It Off: HOW - Impact

• Variety of activities means broad impact!
• Everyone has a different favorite!
Pull It Off: HOW - Costs

$30,000-$50,000 for travel, supplies, ads, busing Michigan Tech students, added security, etc.

Covered by area sponsors

Host costs:

• venue, tables, chairs
• cleaning crew
• tarp for gym floor
Pull It Off: HOW – Michigan Tech’s Role

- All general planning
- Grant writing
- Sign up area schools & partners
- Bring all supplies
- Bring 35-100 student volunteers to run events and be "near peer mentors"
Pull It Off: HOW – Host’s Role

- Location, tables, chairs, maintenance
- Marketing
- Volunteers
- Help coordinate
- As much or little work as you want. The more you put in, the more benefit for you!
Pull It Off: HOW – Liaison’s Role

- Provide step by step instructions
- **Coordinate** with campus
- **Communicate** with schools, partners, Michigan Tech, campus departments
- Brainstorm!!!
Pull It Off: HOW - Benefits

- Promote YOU!
- Volunteer
- Inspire Youth
- Network with businesses!
- Community engagement & outreach!
Pull It Off: HOW - Benefits

- Developing an engaged talent pipeline
- Promoting existing education & STEM programs
- Sharing their “magic” with your community
IN THE NEWS → Public figures often credit success to a mentor at a critical time in youth.

THIS EVENT → Make those connections that could change lives & spark interest in exciting future careers.
Any Questions?

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“... in my 17 years of Girl Scout leadership..., I have not experienced such a rush and enjoyment of sharing life lessons with so many young children (and their parents).”

- Sue Manyen – head of area chapter of the American Foundry Society
“When I grow up I would like to be a scientist or an engineer. I find those things very fascinating and would like to make a career out of it.”
- Bullock Creek MS Student
“Thank you!! I liked all the activities, because it was hands on and we got to interact with the stations… I would like to pursue a career in mathematics, I find math very fun and I would love to expand on my education.”

- Bullock Creek MS Student
“I really don’t think I could’ve seen any cooler stations than the ones that were there! I’m not super sure what I want to be when I grow up. I know that I want to go to college and engineering sound pretty cool.”
- Cramer Jr High Student
“Thank you for letting our Chesaning Middle School come to your amazing science fair. ..., and now when I grow up I’m gonna be an engineer. I am very excited to come and work with you.”

- Chesaning MS Student
Welcome to the Great Lakes Bay Science and Engineering Festival

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