Girl Powered Challenge

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Online Challenge 2023

Raider Robotics

Milwaukee, Wisconsin
MSOE1

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The start of the Raider Robotics Revolution:

Four years ago, a group of six guys began building VEX U robots in a dorm room. It wasn't easy, building robots through many late nights with borrowed parts that they stashed under their beds, but through it all they sustained a relentless drive to improve. From showing up to their first competition with a robot that had never had code put on it, to the elimination rounds, to semifinalists and qualifying for Worlds. This optimism could not be tempered, as they knew this was the start of so much more—and this resolve would be tested all too soon.

The founding members of Raider Robotics and their World Championship Qualifying VEX U robots.

Changing Things Up:

COVID-19 changed everything. It canceled worlds and it derailed many of plans that the team had made. This very well could have stopped the momentum that our team had dead in its tracks, but instead it was used to Change Up what Raider Robotics could be. It became suddenly very evident that if Raider Robotics was going to be sustainable and rise fall like so many other VEX U teams.

Raider Robotics and the Virtual Worlds Excellence Award 2021.

Without being able to have in-person meetings, the virtual capacity of the team needed to grow rapidly. This kickstarted initiatives into cloud-based CAD, project management organizational boards, and new methods for team communications and website design. Additionally, the team was able to move into the MSOE STEM Center, which is a hub for K-12 STEM-based exploration. This was an opportunity that was dormant for now and the team was unable to grow much due to the pandemic, but the capacity building and possibilities uncovered laid the groundwork for the flexibility and dynamic structure that makes Raider Robotics so unique and successful at the collegiate level.

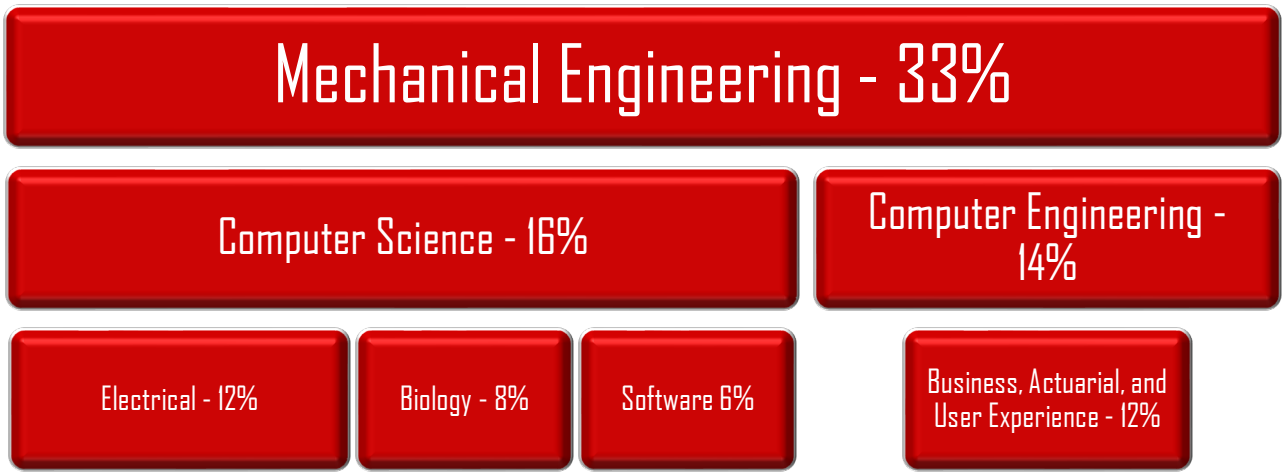
The Tipping Point:

Raider Robotics officially became its own student organization at the Milwaukee School of Engineering. This made Raider Robotics much more accessible to students and established the team as a true organization. This opened the floodgates to an incredible amount of resources to promote our team to a larger audience through MSOE Student Life. Part of this includes training sessions for our elected members to learn about important topics such as Diversity, Equity, Inclusion, and Belonging and Understanding Implicit and Explicit Bias.

"I've talked with the Society of Women Engineers (SWE) about how to reach more women on campus, and slowly but surely, we doubled the number of women on the team. I've also become a member of the Raider Robotics executive board as Financial Director, so I have the power to create meaningful change within the team with a fresh perspective that others may not have."
- *Sonia Grade*

Beyond this however, this also made it possible for Raider Robotics to have Campus-Wide Events, and our team took full advantage of this with five workshops teaching an array of technical skills, from CAD and 3D Printing, to Pneumatics and PCB design, to anyone who was interested. This allowed us to share the tools of innovation to make it possible for anyone to use the underutilized resources and makerspaces on MSOE's campus.

As a result of this we saw incredible changes within our team. From an explosion in membership up to nearly 50 active members and we saw a wide array of representation from other majors at MSOE that we did not have before, such as User Experience, BioMolecular Engineering and Business.



Major distribution of our 49+ active member team

We also structure our team in a way that promotes members to explore well beyond the depth and scope of their degrees—and we've found that this allows unique diversity of perspective. In robot design in particular we've seen this lead to a wider range of ideas and solutions to problems, making the final design more innovative and effective. In terms of team chemistry, a diverse team with different backgrounds and perspectives can lead to better communication and problem-solving as team members can bring their unique experiences and ways of thinking to the table. This can also lead to a more inclusive and respectful team dynamic. In terms of success in VEXU, a diverse team with a range of perspectives can help to anticipate and overcome challenges, leading to a higher likelihood of success in competitions.

Raider Robotics Drive Team at Purdue University VEX U Competition

Spinning Up a Brighter Future

But perhaps even more important, is what we do outside of Raider Robotics to inspire others to be the leaders of tomorrow.

From volunteering at Robotics Events around the state:

Raider Robotics members volunteering at Wisconsin FTC State

To being involved with events in the local Milwaukee Community:

Raider Robotics at a Trunk or Treat event with a candy catapult.

To mentoring other robotics programs:

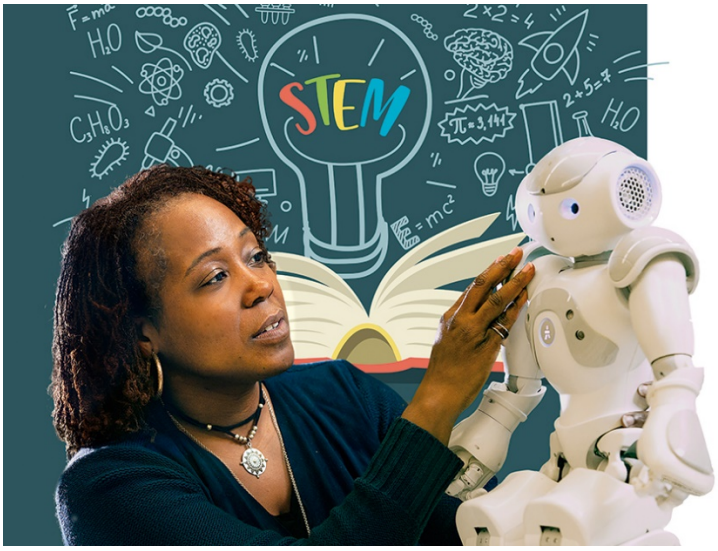
Raider Robotics Members Everen Wegner (Right) and Dylan Powers (Left) and FRC Team 1714

And supporting STEM Center initiatives:

Raider Robotics member demonstrating storing electricity in water with a hydrolytic fuel cell at the STEM Center

In this manner, Raider Robotics is a pathway and opportunity to inspire, support and foster underrepresented communities

A role model for our team in all of this is Dr. Ayanna Howard--a leading researcher in the field of artificial intelligence and robotics-- known for her work in developing intelligent systems that can assist and empower individuals with disabilities.



Dr. Ayanna Howard (Source: STEMSpark).

Dr. Howard's work and advocacy inspire a more inclusive team by showing that technology can be used to empower underrepresented groups and create a more equitable society. Her focus on developing technology that addresses the needs of marginalized communities serves as an example of how a diverse and inclusive team can lead to more innovative and socially impactful solutions in the field of robotics. Dr. Ayanna Howard works to make pursuing innovation accessible, particularly to girls and women. She is recognized as a leader in promoting "girl powered" technology and encouraging girls to pursue careers in STEM fields.

On Raider Robotics, we also strive to incorporate “Girl Powered” initiatives within our team and in the local community around us. To make our team and our future more “Girl Powered” we universally challenge the common stereotypes and pitfalls of traditional gender roles and encourage all members of the team to explore and learn things that are entirely new to them. And we’ve seen incredible things as a result, with the increased diversity of thought and experience causing us to obtain new understandings, explore novel concepts and build unique robots.

Raider Robotics

The “Girl Powered” mission is, “an inspiration for me to keep asserting myself in engineering fields and to advocate for the women on my team and in my community. It’s taught me the importance of a diverse team when it comes to decision making and innovative thinking and is a critical component to our ability to succeed in the future.”
-Sonia Grade