The MATE ROV Competition was created in partnership with the Marine Technology Society's ROV Committee to address marine technical workforce needs and raise awareness of ocean-related career opportunities. The program kicked off with a pilot regional event in 2001; the first world championship was held in 2002 with 22 teams from two countries (the U.S. and Canada).

Since that time, the competition has expanded both its reach (nearly 800 teams WORLDWIDE) and its mission – to inspire and challenge students to learn and creatively apply scientific, engineering, and technical skills to solve real-world problems and strengthen their critical thinking, collaboration, entrepreneurship, and innovation.

The MATE ROV Competition's vision is to build a community of learners, inspired by the ocean, innovating and collaborating to address societal challenges.

**Impact**

- **THE 2019 Magnitude**
- **Students are more interested in Math and Science**
- **More interested in a STEM career**
- **While (my) students might not realize it, the program offers them a real-world experience where they can develop both soft and essential skills.**
- **MATE ROV Competition 2019 Student**

- **Teachers saw improvements in student learning**
- **Employability**
- **A 2015 survey of competitive “alumni” included questions about their higher education, employment, entrepreneurship, scholarships, and other opportunities that opened due to their involvement with the MATE ROV Competition. Highlights of the survey results included below.**

**Challenges**

- **Managing Growth:** “Build it and they will come” - and they did, from around the world.
- **Staffing:** It takes the right people with the right skill sets to administer and sustain the program.
- **Funding:** It takes funding to hire those people and to meet the accelerated demand.
- **Attracting and retaining community college participants:** Students get hired before they make it to the competition - a good problem to have!
- **Other challenges from a student and institutional perspective include limits of time, space (facilities and within the curriculum of program study), and funding.**

**Lessons Learned**

- **It takes a lot of work.** Don’t underestimate the amount of work that it will take to grow and manage the program. Have enough people with the appropriate – complementary – skill sets. Identify and recruit volunteers.
- **It may change course.** Don’t be afraid to let the project go in a new or different direction. Placing the competition in an entrepreneurial, business context took it to the next level and allowed it to attract a more diverse audience of students, volunteers, and sponsors.
- **It will push your limits.** Your program will often push students out of their comfort zones; it will push you, too.
- **It will challenge you – let it.** Surround yourself with people who will challenge you. This will help you to grow as the program does.

The MATE Global ROV Competition is an underwater robotics engineering challenge that engages thousands of students in grades 4-16 each year. Students work collaboratively to design and build an underwater robot to accomplish tasks based on real-world scenarios – from capping an oil well to installing a cabled ocean observatory, documenting a shipwreck, and tackling the ubiquitous problem of plastic pollution in our oceans.

The competition emphasizes and inspires a mindset of entrepreneurship and innovation by requiring students to transform their teams into “start-up” companies that, along with the ROV, produce technical reports, engineering presentations, and marketing (poster) displays. The students then present these products to working professionals who volunteer their time and technical expertise as judges. In addition to technical skills, the competition fosters the development of 21st century workplace skills, such as the ability to think creatively, innovate, problem solve, work as a team, communicate, adapt to changing situations, and manage a project, people, time, and money.

**Global Reach**

Each spring, more than 6,000 students in grades 4-16 participate in one of 40 (and growing) regional events that take place across the U.S. and around the world and feed into the world championship, which is held in June.

The competition is divided into four competition levels or “classes”: SCOUT (entry-level); NAVIGATOR (beginner-intermediate); RANGER (intermediate); and EXPLORER (advanced). This progressive structure complements the educational pipeline by providing students with the opportunity to build upon their skills as they engineer increasingly more complex technology for increasingly more complex tasks, allowing them to stay engaged and advance as they master each level.

**Reflections**

MATE ROV Competition Team Participation 2001-2019

**Competitions’ Influence on Students’ Educational and Career Paths**

- 85% of the college graduates had earned a STEM degree, and 85% of the then current college students were planning toward a STEM degree.
- 72% of the employed alumni were working a STEM-related job, and 22% had worked a job-related to ROVs or other underwater technologies.
- 69% of the alumni had a STEM credential that has helped their ability to communicate the engineering ideas.
- 72% of the alumni mentioned that their involvement in the MATE ROV Competition has enhanced their self-confidence.
- 72% of the alumni mentioned that their involvement in the MATE ROV Competition has enhanced their self-confidence.

**Data Sources**

- National Student Clearinghouse’s (NSC) Data Metrics

A total of 3,574 former competition participants also “alumni” were identified for matching with NSC data. Nearly 2,574 alumni (71%) were from 50 states, 47% of them were male, and 33% of them were female. Of the 1,179 with a major of study in the database, 65% were enrolled in a STEM major. Over three-quarters (79%) of the alumni had a STEM degree.

A second match with the NSC data is planned (December 2019).

“A former competitive participant can now be identified as a participant who competed.”

- MATE ROV Competition 2019 Volunteer Judge

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