Dear Friends,

Since 1985, Oregon MESA (Mathematics, Engineering, Science Achievement) has empowered thousands of underserved students to achieve academic success and become leaders for the future. MESA is an equity program above all else. MESA educators use STEM and invention education to provide students with the preparation and opportunity to increase agency in their own lives.

The 2017-18 school year was a milestone year for Oregon MESA. MESA grew its programs by nearly 40%, serving 25 schools and 600 students in four Oregon counties. Other highlights for this year included deepening our community impact and leading with our invention framework. “Community Roadmaps” was MESA’s first community-based summer networking event for students and families. The event was hosted at the Rosewood Initiative and brought together community organizations and industry professionals to share local resources, engage students in STEM activities, and provide deeper opportunities for families to engage in programming opportunities in the region. Oregon MESA also led the way for MESA USA to integrate Human-Centered Design as the framework for region. Oregon MESA also led the way for MESA USA to integrate Human-Centered Design as the framework for the MESA USA National Engineering Design Competition (NEDC). Oregon MESA Demo Day served as the model for the MESA USA National Engineering Design Competition (NEDC). Oregon MESA Demo Day served as the model for the national challenge which was released to eight MESA (NEDC). Oregon MESA’s Demo Day served as the model for the national challenge which was released to eight MESA USA states.

We could not have achieved our growth without the ecosystem of equity focused partners and funders. This included new regional center partners that helped increase community participation. Our inaugural partners in this effort were Oregon Tech, Centro Cultural de Washington County, and Portland Community College - Southeast Campus. This work was seeded by long term funders including The Lemelson Foundation, the Oregon Community Foundation, and Intel. The 2016-17 fiscal year also saw new funders, including the Meyer Memorial Trust and First Tech Federal Credit Union.

Thank you to everyone in the MESA community for your passion and support for our mission and, most importantly, for your support of the young leaders of tomorrow.

Sincerely,

Tong Zhang, Ph.D Executive Director

"MESA has taught me to be a better engineer, to be a better ally, and to promote a better community. No problem is too big to handle when tackled as a team and the process of creation is so much more meaningful when we encourage each other to grow."

Sarah, Mentor

MESA MISSION & VISION

To provide students underrepresented in the fields of mathematics, engineering, science, and technology with the skills, knowledge, and opportunities to develop their talents, explore technology-based careers, enter college, and compete successfully in the workforce.

VISION

To close the opportunity and achievement gaps in STEM for students in Oregon.

MESA MISSION, VISION, & VALUES

MISSION

The Mathematics, Engineering, Science Achievement (MESA) model began in Oakland, California in the 1970s as a strategy to increase underrepresented student advancement into higher education and in the engineering fields. Since the beginning, the MESA model has been a partnership of higher education institutions, K-12 educators, and industry coming together to empower students in science and engineering.

Oregon MESA was founded in 1985 as a partnership between Portland Public Schools and Portland State University (PSU). Since then, Oregon MESA found a home at PSU as a program initiative of the founding Dean of the PSU-College of Engineering and Computer Science, Chik Erzurumlu. Since the 2000s, Oregon MESA has expanded to many districts within the Portland Metropolitan area and in 2014, MESA served schools in Salem for the first time. Oregon MESA is a member of MESA USA, a consortium serving 45,000 K-16 students in 8 states.

COMMUNITY

MESA is a family of teachers, students, volunteers, organizations, and schools. The community members are the changemakers, not us. We remember and value the power and potential of our communities and students.

DIVERSITY

We think diversity is the solution - not the problem. Transformative problem-solving comes from individuals coming together from different cultures and perspectives to tackle a common goal.

EMPATHY

We walk in each other's shoes before we make assumptions. Understanding problems from another's perspectives allow our solutions to be stronger.

EQUITY

The playing field is not equal. Not in the STEM fields and not in our communities. We recognize the privilege many of us hold and the systemic oppression that exists due to race, power, and class. Only when every individual has the opportunity to reach their full potential can we as a community achieve the same.
With gentrification in the urban core and changing demographics within the Portland metropolitan region, Oregon MESA has expanded the geographic reach of our programs to meet needs within the region. While there was growth in all of MESA’s regions in the last year, there was concerted growth in the underserved areas of North Portland and East Multnomah County. MESA also doubled the number of programs in Washington County by adding more schools in the Hillsboro and Beaverton School Districts. These efforts were lead by support from Meyer Memorial Trust and the Oregon Community Foundation’s K-12 Student Success: Out-of-School Time Initiative. The PGE Foundation, Silver Family Foundation and Juan Young Trust were also significant supporters of this growth.

**EXPANSION**

**CONNECTING THE REGION**

**Regional centers support a pipeline to educational advancement**

MESA also hosted “Community Roadmaps,” the first community-based summer networking event for students and families. Supported by a mini-grant from the East Metro STEAM Partnership (EMSP), this event provided students and families in the East County region with deeper connections to local industry and community organizations. The event supported 52 students and parents and served community members in Centennial, Gresham-Barlow, Reynolds, Portland Public, and Corbett School Districts.

**COMMUNITY OUTREACH**

MESA’s College and Career Program helps students feel supported and confident in their ability to succeed scholastically and enter the global STEM marketplace. These opportunities provide a new sense of possibility for kids who have typically never had exposure to higher education, STEM careers, entrepreneurship, or applicable role models in these areas.

This past year MESA engaged 148 people in student-facing volunteer roles to serve as role models and connectors for students. Industry partners with the most volunteers this past year were Intel, Daimler, and Bonneville Power Administration.

This year’s Demo Day event was hosted by Daimler Trucks NA and allowed 50 students from 13 schools to showcase their solutions for “Serving Seniors” to an audience of their families and the community. Over 150 students, volunteers, teachers, and families attended the 2018 Demo Day event.

**FAMILY ENGAGEMENT**

Families are key to helping students embrace the opportunities that STEM and invention can provide. MESA’s strategy for engaging families includes family nights, community outreach events, and personalized recruitment for opportunities. MESA Family Nights reached 444 participants this year. According to the family member of one MESA student, “He loved MESA and we want him to go with this field to the end. We believe in him and he believes in himself, so by your support he may be an inventor.”

**REGIONAL CENTERS**

This year MESA implemented a Regional Center model, an approach used by other MESA states nationally to increase access to community resources and partnerships. Regional centers are universities, colleges, or community centers that are anchors for local opportunities and relationships.

1. **Oregon Tech, Wilsonville**
2. **Centro Cultural de Washington County**
3. **Portland Community College SE**
4. **Rosewood Initiative**
5. **R.A. Brown Middle School**
6. **Daimler Trucks North America**

**FAMILY ENGAGEMENT**

MESA Family Nights reached 444 participants at 15 schools.
INVENTION PROCESS: IN THEIR OWN WORDS

The Oregon MESA Invention Toolkit was developed to support educators and students in turning creative ideas into tangible inventions for real clients. This past year, the MESA USA network adopted the framework as the model for the MESA National Engineering Design Competition. Our invention education approach provides students with the skills and knowledge to enter into the innovation economy by 1) giving students the power, choice, and agency to create innovative solutions for real-world problems, 2) providing students with hands-on science, technology, engineering and math (STEM) skills necessary to power their innovative ideas, and most importantly, 3) connecting students with the social capital (which includes dedicated educators, relatable mentors, and inspiring role models) needed to support them through failures and successes. Our support from The Lemelson Foundation makes this work possible and helps us inspire and empower more underserved students throughout the state to invent a better world.

STEPS IN THE INVENTION PROCESS

**STEP 1: INTERVIEWING**

Interviewing and empathizing with your client

“When interviewing the client, I learned that it is very important to notice and understand the client’s feelings and the details of the situation. Being able to connect and understand the hardships of the client can help motivate me to spend time on developing a solution to the problem.” - Melissa, Student

**STEP 2: NAMING**

Naming and defining the problem

“It is difficult to narrow the problems down to something simple that can be solved in a tangible way. I like to see the students interview the same client but then define very different problems they are trying to solve.” - Katrina, Advisor

**STEP 3: VISIONING**

Ideating and creating different solutions

“Quick brainstorming is key in this part of the process. Students learn that problems don’t have a single solution, and that sometimes the ‘outside of the box’ ideas are the most valuable.” - Kerryn, Advisor

**STEP 4: EXPERIMENTING**

Making prototypes

“The prototyping stage is always the most fun and interactive step for students. It allows them space to demonstrate and visualize a solution as a team, experiment with quirks not previously considered, and gain confidence in their project.” - Sarah, Mentor

**STEP 5: ENGAGING**

Testing your product

“When designing a product, data always plays an important role, so it is important to provide data behind every design choice made. This helps increase our confidence in applying innovative designs and overall help create a more effective product.” - Melissa, Student

**STEP 6: TELLING**

Presenting and sharing it with the world

“Our students have talents that often go unnoticed. At MESA, students are seen for their innovation and creativity. They are recognized for the great ideas they have and the products they create. This changes the way they feel about themselves; they can see themselves working in the STEM fields.” - Kerryn, Advisor

VISUALIZATION OF STUDENT DATA

**TOTAL 602 students**

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**2017-18 STUDENT DEMOGRAPHICS**

- 42% Girls
- 1% Nonbinary
- 53% Boys
- 4% Did not report

- 51% Qualify for free or reduced lunch

**IMPACT REPORT**

- 98% students reported gaining confidence in one or more invention skills
- 80% reported greater confidence in identifying a problem, working with others on a team, thinking creatively, solving problems while building, and designing products
- More than half of underrepresented minority students reported that participation in MESA improved their test scores (60%) and attendance (59%)
- 91% students agreed or strongly agreed that participating in MESA taught them about careers in STEM
- 93% MESA students agreed or strongly agreed that they felt like they belong in MESA
- Nearly all students agreed or strongly agreed that their MESA Advisor supports or encourages them (96%), listens to what they have to say (97%), and helps them find answers to their questions (95%)

Based on surveys conducted by Education Northwest

Answers were 1) I strongly disagree, 2) I disagree, 3) I agree, 4) I strongly agree, 5) N/A

Nearly all students agreed or strongly agreed that they felt like they belong in MESA

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**2017-18 STUDENT DEMOGRAPHICS**

- 56% Students of Color
- 46% Underrepresented Minorities
- 12% Multi-Racial
- 30% Hispanic/Latinx
- 1% Pacific Islander/Native Hawaiian
- 3% Black/African American
- <1% American Indian/Native American
- 10% Asian American
- 37% Caucasian
- 7% Did Not Report

**INVENTION TOOLKIT**

“Step five is the fun! In this step, students create a more effective product. ‘When designing a product, data always plays an important role, so it is important to provide data behind every design choice made. This helps increase our confidence in applying innovative designs and overall help create a more effective product.’ - Melissa, Student

**INVENTION TOOLKIT**

“Centered Design has been amazing. It gives students the power, choice, and agency to create innovative solutions for real-world problems. The MESA USA network adopted the framework as the model for the MESA National Engineering Design Competition. Our invention education approach provides students with the skills and knowledge to enter into the innovation economy by 1) giving students the power, choice, and agency to create innovative solutions for real-world problems, 2) providing students with hands-on science, technology, engineering and math (STEM) skills necessary to power their innovative ideas, and most importantly, 3) connecting students with the social capital (which includes dedicated educators, relatable mentors, and inspiring role models) needed to support them through failures and successes. Our support from The Lemelson Foundation makes this work possible and helps us inspire and empower more underserved students throughout the state to invent a better world.” - Katrina, Advisor
MESA PARTNERS
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$100,000+
The Lemelson Foundation
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$20,000 - $99,999
First Tech Federal Credit Union
Fred W. Fields Fund of the Oregon Community Foundation
Intel

$5,000 - $19,999
East Metro STEAM Partnership
Juan Young Trust
J.W. & H.M. Goodman Family Foundation
PGE Foundation
Silver Family Foundation
Trailblazers Foundation Fund

$1,000 - $4,999
Free Geek (In-kind)
Pacific Power
David Squire
Umpqua Bank

$1 - $999
Daimler Employee Giving
Christy Lutz
Gerry Rectenwald
Jennifer Ruwart
Laura Sakaguchi
Peter Schroeder

FINANCIALS
REVENUE
$697,284

EXPENSES
$624,470

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