



SMILE's Program Framework:
Fostering College Access and Success Through
University/School/Community Partnerships

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PROGRAM INTRODUCTION

Dr. Miriam “Mimi” Orzech founded SMILE in 1987 based on the belief that there is no rational reason why we should be able to identify someone’s ethnicity by whether they attend and succeed in college.

Program Overview

Science and Math Investigative Learning Experiences (SMILE) is a precollege program at Oregon State University (OSU) that fosters student aspirations, preparations, and access to higher education. SMILE works in partnership with thirteen Oregon school districts, in mostly rural communities, to increase the number of minority, low income, historically underrepresented, and other educationally underserved students who graduate from high school, qualified to go onto college, and pursue careers in science, math, engineering, health care, and teaching.



Together with teachers, schools, families, and communities, SMILE provides a year-round program of science and math enrichment outside of the classroom. Each year, the program engages 600-700 students in grades fourth through twelfth in after school clubs that emphasize hands-on science, technology, engineering, and math (STEM) experiences. The club activities are inquiry-based and demonstrate real life applications of STEM knowledge and skills linked to college programs and careers. In addition to the after school clubs, program elements include: STEM related field trips, problem-solving Challenge Events on college campuses, science camps, Family Math and Science Nights, and a Summer Bridge-to-College Program for high school graduates from underrepresented groups entering OSU. Each element serves to intentionally build the link for students between their expanded interest and knowledge in science and mathematics to potential programs in higher education.

The SMILE Program reaches educationally underserved students, views them as future college students, and encourages them to develop their own vision for their academic success. SMILE aims to assure equal access to higher education by helping students and their families overcome intrinsic and extrinsic barriers in order to *Envision, Believe, and Succeed* along the road to college.



Students proudly show off their “SMILE It’s Hot!” T-shirts on “the road to college”. Each team built a house model including a duct system to move warm air.





PROGRAM INTRODUCTION

SMILE Program Mission

To help elementary and secondary school students acquire the skills, knowledge, aspiration, and attitudes necessary to qualify for higher education and contribute to OSU's educational objective of diversifying its student population. The targeted students are those who are disadvantaged educationally by low socioeconomic status, low household education level, linguistic or cultural backgrounds different from those which dominate Oregon's elementary and secondary school system, or are from groups whose high school graduation rates are lower than the state average.

Defining the Problem

To increase the participation of first generation, low income and underrepresented minority youth in higher education, we must understand the barriers to their persistence and attainment in school and how to increase their ability to become college ready.

"Geographically isolated students are less likely to attend an Oregon public university" (OUS, 2005). Furthermore, only about sixteen percent of Oregonians living in rural areas hold a bachelor's degree compared to approximately thirty percent in metropolitan areas (OUS, 2005).

There is a lack of proficiency and interest amongst American students in STEM fields (President's Council of Advisors on Science and Technology (PCAST), 2010). The National Assessment of Educational Progress states that "less than one-third of U.S. eighth graders show proficiency in mathematics and science" (PCAST, 2010). The gap in interest and achievement widens in STEM amongst certain groups; "African Americans, Hispanics, Native Americans, and women are seriously underrepresented in many STEM fields", thus limiting their access to many well paying professions and depriving the nation of their talents (PCAST, 2010).

According to the Pathways to College Network, as cited in The College Board (2006), only about half of African American and Latino ninth graders graduate high school in four years, compared to 79 percent of Asian Americans and 72 percent of whites.

National data sets reveal that academically engaging after school programs are especially important for students that come from family backgrounds with lower incomes and less education, such as our target populations here in Oregon. Students from a lower socioeconomic status are more likely to be placed in a tutoring program rather than joining an after school program (Little, Wimer, & Weiss, 2008), similar to SMILE. Consequently, students do not receive the benefits associated with participating in academic enrichment experiences, such as the activities implemented in our clubs.

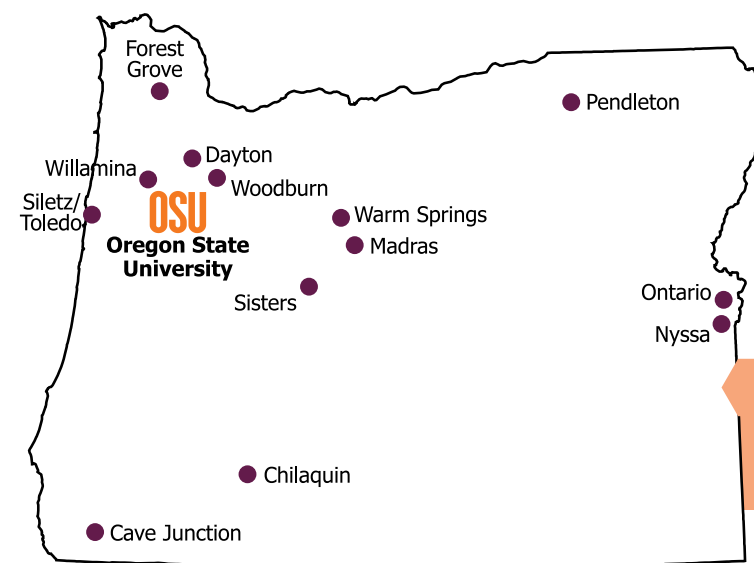


Rural Oregon has few large cities and vast distances between communities. When we hold a Middle School Engineering Design Challenge Event on our campus, the collective round trip is more than 4,500 miles from thirteen clubs.

When asked what keeps students coming back to SMILE Programs, one teacher commented: "Food, fun, and the idea of travel."



PROGRAM INTRODUCTION



The thirteen SMILE communities in rural Oregon.



Rural Oregon students attend a SMILE club field trip.

Addressing the Need

SMILE is committed to creating educational opportunities for underserved rural, Latino, Native American, low income, female, and first-generational-college youth, preparing them for high school graduation and entrance into higher education. SMILE works with students and their families to help them overcome intrinsic (such as self-confidence) and extrinsic (such as financial) barriers along their road to college.

The students who participate in the SMILE Program are academically capable students but do not tend to have equal access to a college education. They need additional support and encouragement to aspire to and reach college, especially if they do not identify with someone who has been to college. We work with these students, their families, and their communities to create a "college going culture", which we believe takes at least seven to ten years, requires continued and persistent programming like SMILE, and influences families to talk about what their child is going to study in college, not if they are going to college.

When asked what they gained from attending a SMILE College Connection Event at OSU, a high school student responded: "I started to better understand how important it was to go to college and to start thinking about that."





PROGRAM INTRODUCTION



Bringing students to a college campus is the best way to connect them to their aspiration for higher education. Each year we bring high school students to a campus for a challenge that we structure around the application of content knowledge and skills gained in their clubs. Students are treated as college students for the day, not just visitors.

Families' perceptions of higher education and their unfamiliarity with the college entrance process pose barriers to a student's access to college. In 2005, thirty-five percent of Oregon's university students were the first in their family to earn a bachelor's degree. These "first generation" students tend to be low-income, minority, and/or female students that are traditionally underrepresented in higher education. Their families are not as acquainted with the necessary steps to college and need guidance to understand the language and processes of college entrance. For example, the differences between subsidized and unsubsidized loans, how to find the schedule of entrance exams, and navigating decisions around housing can all be confusing and overwhelming to a family with no experience within the college system. There is a leaky pipeline to college for these traditionally underserved students, but the SMILE Program addresses students' and their families' concerns about higher education in order to increase the students' possibility of attending college



Through our Summer Bridge-to-College Program students gain an empowering sense of their belonging and capacity within higher education

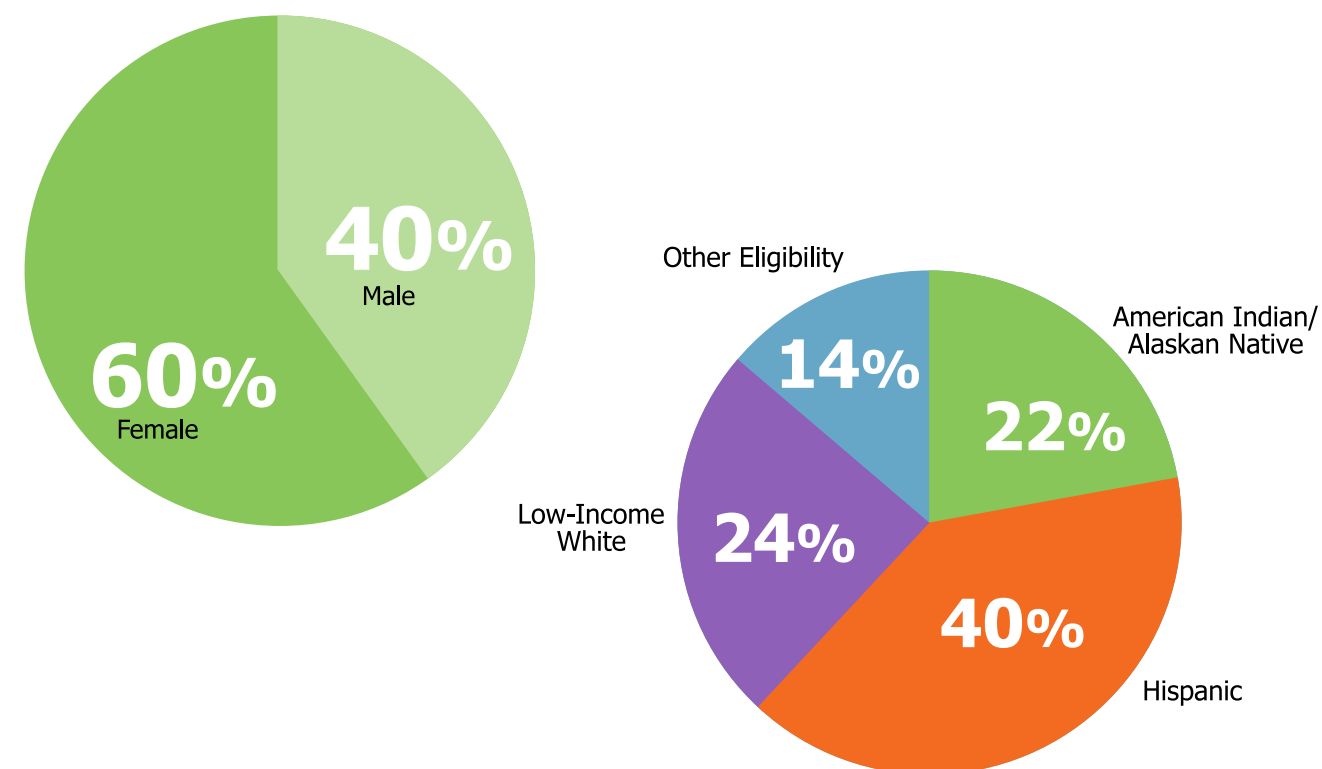


SMILE engages minority populations, specifically rural, Hispanic, Native American, and female students who are of critical concern because they have the lowest freshman participation rates, low graduations rates, and are often underrepresented in STEM technology and careers. Our programming meets the need identified by OUS to work closely with K-12 schools and communities to decrease the disparities between these underserved populations and the majority of the population through academic preparedness.



PROGRAM INTRODUCTION

Over the past 25 years the program served almost 7,500 students, of which 60% were female, 40% male; 22% were American Indian/Alaskan native ethnicity, 40% Hispanic, 24% low-income white, and 14% other eligibility (first generation to attend college, linguistic minority, and/or Title I-C, III, VII-A).



SMILE was created to provide substantial and engaging learning environments at a pivotal time in a student's life when they are deciding upon their aspirations and dreams. Our founding members and initial leaders, wanted to create a fun, safe, academic, after school, participatory, STEM focused program that would help rural, minority, female, and low-income students overcome the issue of unequal access to higher education.



Founder Dr. Miriam "Mimi" Orzech on right and former Directors Eda Davis-Lowe (formerly Davis-Butts) on left and Sue Borden in the center.





PROGRAM INTRODUCTION

Program Evolution

When the program leaders first met, they built a program based on Oregon State's Land Grant traditions, which include a specific mandate to provide outreach programming to meet the needs of the state of Oregon. The OSU campus houses the Oregon 4-H program, and the proposal for after school clubs used their model for student engagement and applied knowledge as the basis for the SMILE club model. The one major difference from 4-H was SMILE's involvement of the public school teachers as club leaders. This reinforced the role of the program as a university and school partnership. Another program looked at was the Mathematics Engineering Science Achievement (MESA) program, originally founded in 1970 serving African American students in Oakland California, and led by the University of California at Berkeley. In 1980 MESA had formed a satellite program in partnership with Portland State's College of Engineering providing club-based programs for urban African American students. Given OSU's focus on rural communities and the underserved students in rural Oregon, early discussions led to the focus of serving rural minority youth and schools. SMILE has grown to include some urban programming, but the focus remains on STEM programming that bridges the gap to college access for underserved youth in our rural communities.

The PCAST (2010) report states that better STEM education needs to be a national priority and that among other initiatives, the Federal Government should develop a "wide range of high quality STEM-based after school activities such as STEM contests, fabrication laboratories, summer and after school programs, and similar activities", all of which SMILE has been doing for twenty-five years. Students are much more successful in STEM education when they are provided opportunities to build personal connections to the ideas and excitement of STEM fields (PCAST, 2010). SMILE gives students these educational opportunities while simultaneously featuring the need to attend college, and the possibilities of future careers in STEM fields



The Madras/Warm Springs SMILE club at their first Middle School Challenge at OSU in 1990 brought not only students and their club leaders to college, but also parents to campus for the Engineering Design and Mathematics Challenge.



PROGRAM INTRODUCTION

Brief History

By 1989, in its second year, SMILE had eight middle school programs with sixteen teachers leading after school clubs.

In the early 1990s, we recognized the need to serve younger students too in order to create a "college-going culture" so we added elementary school clubs in these eight communities.

By the mid 1990's each community had grown to the complete pipeline of today--clubs and programs serving grades fourth through twelfth.

We increased the focus on teacher professional development, both to support the teachers' roles as SMILE club advisors, and to help improve the classroom practice in areas such as Science Inquiry.

In 1993-94, a teacher from Rhode Island spent her sabbatical at OSU and returned home to start a SMILE-like program in her community, connected to the University of Rhode Island. The SMILE Program at University Rhode Island now has sixteen clubs in three communities.

In 1994-95, through a grant from Apple, Inc. the program was able to provide each club a desktop and laptop computer, along with significant training to view the early version of the World Wide Web. The program provided a dial-up ISP service due to the rural nature of our programs and provided each teacher an OSU e-mail address. This built a strong relationship between our technology, computer science, and mathematics curriculum development.





PROGRAM DESIGN AND DELIVERY

SMILE delivers programs in five key areas designed to assist students in high school graduation and entrance into higher education.

- Teacher led after school clubs
- College Connection Events including a challenge in a team-based learning setting on a college campus
- Summer Bridge-to-College Program (Summer Bridge) for underserved high school graduates entering OSU in the fall
- Elementary Outdoor Science Adventure Camps
- Family Math and Science Nights (FMSN)
- Teacher Professional Development Workshops

At FMSN we invite the club members' families, including younger siblings, to learn and enjoy math and science for an evening.



Critical Elements of After School Clubs

SMILE clubs are the foundation of the program and facilitate a crucial learning experience based on the understanding that “waking hours outside of school can be critically important to STEM learning and interest” (PCAST, 2010). Likewise, studies suggest that STEM expertise is not as much a matter of innate talent as it is “having the opportunity and motivation to dedicate oneself to the study” of STEM subjects and being given the time “to enable the brain development needed to think like a scientist, mathematician, or engineer” (PCAST, 2010).

Our weekly after school clubs provide time to develop math and science skills and language while also giving students equally important chances to model professional observation, learn to hypothesize, collect data, conduct scientific reasoning, and make data informed decisions. Students meet and work with professionals in the field through clubs, community projects, field trips, and annual campus Challenge Events. As a result, students build skills to solve complex real life problems, learn to work as part of a team, and how to interpret and communicate information to stakeholders and the general public.

Little et al. (2008) found that after school programs, similar to SMILE clubs, improve academic achievement “by affording children and youth opportunities to learn and practice new skills through hands-on, experiential learning in project-based after school programs”. In fact, studies “indicate that elementary and middle school students who participated in high-quality after school programs, alone or in combination with other activities, for two or more years, demonstrated significant gains in standardized math test scores when compared to their peers who were regularly unsupervised after school” (Little et al., 2008).

Similar research suggests that the underlying theme among successful after school programs, designed to improve academic success, is the balance of combining academia with a “variety of engaging, fun, and structured extracurricular or co-curricular activities that promote youth development in a variety of real-world contexts” (Little et al., 2008). By intentionally providing a safe after school environment that fosters appreciation for academics through fun and enriching STEM based activities, our clubs and annual challenges build the foundation for an interest in higher education and careers in science, math, engineering, or health related fields.



PROGRAM DESIGN AND DELIVERY



At their Middle School Engineering and Design Challenge, teammates work on the board game, "On the Road to College", that they were hired to design and build by the Acme Toy Company.

National data sets reveal that academically engaging after school programs are especially important for students who come from family backgrounds with lower incomes and less education, such as our target populations here in Oregon. Students from a lower socioeconomic status are more likely to be placed in a tutoring program than to join an after school program (Little et al., 2008), similar to SMILE. Consequently, students do not receive the benefits associated with participating in academic enrichment experiences, such as the activities implemented in our clubs.

Autonomy and choice are an important factor in the success of our clubs. Students vote with their feet, as clubs are completely voluntary, and students choose to come back to the clubs year after year because they feel like a valued member and voice. Tessman, Gressley, Parrott, and Hall (2009) note that belonging is a powerful human motivational need. People “need to feel safe and at ease” and being accepted by a group is an important part of childhood and adolescent development (Tessman et al., 2009). Furthermore, youth want to be a part of a group that feels inclusive and “open to their input”, which allows youth to “feel needed and become an integral part of the group” (Tessman et al., 2009). By providing an appropriate club structure that allows students to have fun, be an integral part of the group, and to be challenged in ways that allow them to be successful, students increase their self-competence and, therefore, choose to come back to our positive and supportive club atmospheres.

Relationships

Tessman et al. (2009) suggest that the quality of relationships in a program is the primary reason for persistence, outweighing any other factors such as space or location. Our clubs are designed to provide these relationships with well trained and dedicated teacher leaders, and by our leader to student ratio—one leader for every ten students, and approximately twenty students per club—allow for the “reciprocal process” of true belonging where the group needs the youth as much as the youth needs the group (Tessman et al., 2009).

Enjoying the sun, campers and staff talk and eat lunch together building upon their relationships and sense of belonging.



In addition to the importance of a college degree, we want our to students to see college is fun too. Annual evaluation quotes help us know we are on track. One of our graduating seniors shared: “I have been in SMILE ever since I was in fourth grade. I think it has really helped me to want to go to college. I had a great time being in SMILE.”





PROGRAM DESIGN AND DELIVERY

SMILE clubs are the place where students and club leaders build community, develop a context for teaching and learning, and establish and maintain relationships through continuity. Our clubs are led by caring teachers who foster an atmosphere of valuing education and provide positive quality interactions with youth that support their learning process (Little et al, 2008). Furthermore, our club leaders provide effective group management, which is necessary to allow students to feel respected by other youth and adults in the program and to have fun while learning together (Little et al, 2008).



Comradery and friendship is built amongst students in an after school SMILE club.

As noted by Little et al. (2008), research shows that established and maintained relationships between students and adult role models in an engaging after school atmosphere builds self-esteem and self-efficacy in students. Additionally, dedicated and well-trained teachers help to build positive social norms. "Social norms refer to acceptable habits, norms, and expectations of behavior" (Lauxman et al., 2007). Quality programs like SMILE clubs, embrace different cultures and viewpoints, while providing different life situations within which students learn to "understand the importance of positive youth interaction, pro-social values, and behaviors across settings" (Lauxman et al., 2007). SMILE club leaders and staff acknowledge "cultures and subcultures are an important source of social norms" (Lauxman et al., 2007) and incorporate cultural-sensitive teaching strategies into club activities. SMILE students learn to be accountable, respectable, and to live up to program expectations, norms, and values.

The program reach extends beyond the clubs to all the students taught by SMILE teachers. Our professional development for teachers increases their interest and competence in STEM, improves their pedagogy, and supports them as classroom practitioners. By honing our teacher development we impact thousands of more students outside the clubs via the classroom.



A SMILE club learns about science and math in a safe and fun environment that embraces different cultures and values each students' voice and contributions.



PROGRAM DESIGN AND DELIVERY

Critical Elements of College Connection Events

Our College Connection Events are an opportunity for students to come to a college campus in Oregon, stay overnight, begin to feel like a member of college, and take part in a team-based challenge that addresses a real community-based problem. Our annual College Connection Events involve students in developing a solution, with their teams, to a problem-based challenge. Teams are made up of students from various clubs so that they get to practice working with new people, and the nuances of group dynamics.



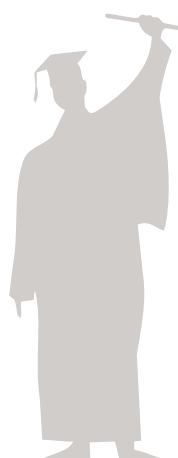
High school students get a sense of college life while attending a lecture on ocean debris at WOU in preparation for the next day's Challenge Event at OSU.

Our teacher chaperones note the significance of College Connection Challenge Event experiences in their SMILE Program evaluations. When asked what students specifically learn and achieve at the challenges they answered:

- Communication and teamwork and all the variables that go into making a desirable community.
- How to assemble a broad range of data and skills to achieve a group goal.
- How to communicate with others.
- Getting out of their shells.
- Teamwork, productivity, planning, and co-operation.
- Teamwork, community planning, and problem solving.
- How to step into necessary needed roles. Some even when uncomfortable. Noticed the majority of students taking on responsibilities that they would never have at home (due to clicks, stereo typing, etc). Opportunity to be a valued group member.
- Being at both colleges (Western Oregon University (WOU) and OSU) gives students a feel of what college is like and how they will look there.



Our challenge-based College Connection Events began with an engineering focus. A student proudly models their "Future Inventors" T-shirt from the 2002 Engineering Challenge.



PROGRAM DESIGN AND DELIVERY



A student learns about engineering with her college mentor while trying out a water powered vehicle that can be driven by air pressure.

Engineering and Design Challenges

To connect the club members to college, the SMILE Program created College Connection Events that bring students to campus where they learn about college life, interact with college faculty and students, and gain confidence that they too would attend college. One of the pivotal collaborators in defining these events, and from whom the model for student engagement arose, was Len Weber, Electrical Engineering faculty at OSU. It was Len

who, working with Sue Borden, SMILE's then Assistant Director and Math Instructor, conceived of the first Middle School Challenge.

Club members and their leaders, traveling from all over the state, arrived on campus ready for a challenge. Working in teams of five to eight students, each team was given the needed design criteria, a simple kit of materials, and basic tools. Along with these initial parts, there was a tool and materials table with more interesting items, that was staffed by adult mentors. At the tool table they got advice, used drill presses, saws and hammers, many for the first time. No drawings or other instructions were given, as Len believed that hands-on tinkering and problem-solving was the key to creativity, and that the challenge was the motivation. Yet this was not a competition.

At each Middle School Engineering and Design Challenge students create and test products and prototypes.



There were some years when we were convinced that Len had created the impossible challenge, but in every year for the past twenty-five years, the students have risen to the occasion and learned that they were capable of succeeding at college. Each project supported the exploration and creativity of different team members so that they had a strong sense of success and capacity to succeed at college.

PROGRAM DESIGN AND DELIVERY

Challenge structures have stayed relatively the same but the subject matter has changed over the years to incorporate different areas of STEM education and application. The Cooperative Institute for Oceanographic Satellite Studies (CIOSS) and the National Oceanic and Atmosphere Administration (NOAA) funded a decade of ocean-science related challenges that included topics such as: fisheries management, tsunamis, and the travel of ocean debris.

High school Challenge teams created tsunami public service announcements.



The first High School Challenges were through a National Institute for Environmental Health Sciences grant linking public health concerns to the environment.



Summer Bridge-to-College Program (Summer Bridge)

SMILE clubs are the foundation of the program and facilitate a crucial learning experience based on the The Summer Bridge Program is designed to support graduating SMILE, and other incoming first-year students from underserved groups, who will be attending OSU in the fall. The goal of the program is to increase matriculation and retention in higher education. The fifteen-day residential program transitions into the start of the academic year, giving participants a chance to adjust to their new surroundings at OSU before the rest of students arrive.

Currently, during the Summer Bridge Program students:

- Learn about Bioenergy science and research at OSU
- Learn about the available campus resources for student success
- Gain skills and knowledge that will support their study skills and work habits
- Think critically about the role of programs, research, and higher education in addressing society's challenges





PROGRAM DESIGN AND DELIVERY

Elementary Outdoor Science Adventure Camps

Elementary Outdoor Science Adventure Camps were a big part of the SMILE Program for many years. Camps provided students an opportunity to work in the field and live on-site at the research area to conduct investigative studies and collect data like a scientist. They also provided an opportunity to have fun, connect science to real life, and another opportunity to build relationships with peers and caring adult mentors (club leader chaperones, SMILE staff and camp counselors).



Two proud campers show their data and samples collected from the meadow community.



Campers explore the living world with a college student instructor. These instructors stay with students at camp and share their enthusiasm for learning, their stories about college and their passion for education.

While at camp, students investigated relationships within and between ecological communities by conducting a plant and animal survey and tracing out ecological connections in forest, meadow and pond communities. Specifically, for each community, students looked at community characteristics, plant and animal characteristics, populations and adaptations, food chains and webs, energy and nutrient cycling, and the environmental and human impact on the communities. Campers learned to identify three living communities by their plant and animal populations, develop an awareness of how organisms interact with their environments, were able to use scientific tools for ecological studies, and understand that communities are an integration of several parts. They learned about the integration of biotic and abiotic factors to create ecological communities. Investigations covered soil types and characteristics, nutrient cycling, sunlight levels, and the water cycle. Activities addressed how these factors affect the communities under study at the camp research area. Community mapping activities allowed students to explore the location, boundaries, physical dimensions and characteristics, and the role of the pond, forest and meadow.



PROGRAM DESIGN AND DELIVERY



Students investigating a sample of mud and detritus learn about soil types, nutrients and hidden life.

Camp curriculum emphasized science process skills (such as observing, measuring and predicting) and taught students sampling and mapping techniques, chemical analyses, and the use of compasses, and light and other meters. For a final project, students used their newly acquired skills to collect data at a new site and brought materials and collections back to share with others. Students kept a field notebook, which served as a resource and learning tool, to record their observations, data, drawings, and conclusions. In addition, students created sample plant identification posters to share with the group.

Examples of campers' plant samples, identification skills, field notebooks, and adaptable critter creations.



Family Math and Science Nights

To build a college-going culture, it is not enough to work solely with students. We must also give thoughtful attention to helping parents build stronger aspirations for their children's educational and career futures. Higher education must be tangible to the entire family, and to the community at large, in order to truly build the desired community-based social norms and values that generate a culture that expects college attendance from its youth. Held annually in each community, SMILE's FMSN brings together SMILE club members, their families, and the broader community. Welcoming the family and community to the SMILE Programs assures that parents, siblings and others know about the program, meet the club teacher/advisor, and see the types of activities their students will enjoy as part of the club.



Student camper proudly poses for a picture with his finished adaptable critter.





PROGRAM DESIGN AND DELIVERY

Families enjoy an evening of fun and learning during FMSN at their local schools.

To engage the participants, older clubs members, their SMILE club advisors, and community partners such as 4-H offer a variety of hands-on STEM activities and informational displays relating to college readiness. For many it is a time to learn about the new program their child has joined and, for the older students, it is a time to exhibit leadership in the program.

Participation in the community FMSN Nights builds a context within which SMILE students, parents and teachers work together to create stronger collaborations among the schools, parents, sponsors, and SMILE staff. Students and their families see this network of support, which builds their trust in the community, and encourages their participation in SMILE Programming, and eventually higher education.



Families enjoy an evening of fun and learning during FMSN at their local schools.



CREATING A COMMUNITY OF PRACTICE

Given the nature of our statewide program, our partner relationships with teachers is central to our ability to reach and engage youth. The teachers create the specific climate that meets the needs of students, and that brings them back week-in and week-out. Teachers participate in our professional development workshops and then translate our vision and mission via their schools and communities, based on the social cultural environment in each of the thirty-three clubs. In most cases, the teachers work in both school and community teams including other teachers, principals, families, community members, local business owners, scientists and professionals, and college partners. One significant aspect of our teacher participants is their longevity, and our current teachers average more than eight years with our program. There is a long legacy of teachers, as well as new teachers, when we begin each year. Their commitment and passion is central to our success.

Teachers noted two major aspects to what they gained from being a part of the community: they saw great benefit to the students who participated in the positive learning environment, and they felt like they were a part of something significant where their contributions were clearly valued. Based on this, we began to see the value in caring for, defining, and fostering this learning community as a **SMILE Educator's Community of Practice**.



We define our Community of Practice with a working definition adapted from the ideas proposed by Lave and Wenger (1991) as follows:

- A community of practice can be defined as an intentional learning community with the following shared characteristics:
- A sense of membership exists in a community with a common mission, purpose, values, and vision.
- A common professional language, understandings, and "tools of the trade" are present.
- Each member is defined as a "leader," with a role in fostering the overall community as well as taking a direct role in supporting the overarching mission and defining and refining the knowledge and tools.

Inherent in this definition, is an understanding that our teachers gain in three professional and personal areas: as lifelong professional learners, develop new pedagogical skills and STEM knowledge as classroom educators, and create a sense of alliance as SMILE club leaders. Our teachers build friendships with each other and know that together they are working to advance common goals and to secure the future of our students.

In addition to teachers, our statewide partnerships also includes: scientists, mathematicians, engineers, and both undergraduate and graduate students who work with SMILE to engage students in STEM content, share future academic possibilities, and link their interests to career aspirations via high quality programs that create a community culture that includes attending college.





CREATING A COMMUNITY OF PRACTICE

Reflective Practice and Evaluation

Program Goals:

The SMILE Program has a primary goal of fostering the academic achievement and educational attainment of historically underrepresented and other educationally underserved students and influencing the students' higher education aspirations and career choices. To assure we are meeting these mandates we continuously design, reflect and refine our programs based on a wide variety of data we collect.

Broad Program Goals Include:

- Increasing minority, low-income, and first-generation students' success in school and access to higher education;
- Improving math and science education through enrichment and life long learning;
- Developing university and community partners to serve students, families and communities; and
- Involving families and communities in the support of youth and education.

These Themes Translate into the Program Elements of SMILE:

- Providing enrichment learning opportunities that aid in the targeted students' persistence and attainment in school and entrance into college.
- Supporting a sense of cooperation, collaboration and shared vision for all participants.
- Shaping problem-solving skills with real-world contexts using science and mathematics.
- Building community by facilitating a network of caring adults as mentors, educators and role models.
- Providing constructive opportunities for parent, family and community involvement.
- Supporting positive youth development through asset building, resiliency, self-esteem, achievement, etcetera.
- Developing university-school-community partnerships that offer opportunities for university faculty and students to engage in academic outreach to precollege students, educators and families.

Much of our assessment is to assure that we maintain fidelity to these elements throughout our programs. This idea of program fidelity helps us engage a variety of partners in conversation about how best to create the learning environment that will foster students' success over time. We use this information among staff and partners as part of teacher's workshops, in grants and publications, to help define what is significantly effective and to build on this work.

Assessment and Evaluation Tools:

Database (updated throughout the year)

- Students currently enrolled in club, basic demographics and all past enrollment, persistence, and longevity.
- Persistence in club, school and college enrollment.
- High School math and science course enrollment, and graduation.
- Campus Connection Event participation by students, teachers and community members.

Monthly club reports (teachers complete a monthly activity log for each club)

- Number of students and adults participating in each club meeting.
- Number and content of meetings.
- Comments about activities and curriculum materials.
- Location and types of field trips.



CREATING A COMMUNITY OF PRACTICE

Program, Event and End-of-Year Evaluations

- Program evaluations from students for events: Middle School (MS), High School (HS), and Challenge Events (CE).
- Program evaluations from teachers for events: Elementary Outdoor School Adventure (EOSA), MS, HS, and CE.
- Program evaluations from teachers for Professional Development: New Teacher's Orientation, Winter and Spring Teacher Workshops (TW).
- End-of-Year Evaluations: teachers, students and parents.
- Mentor evaluations: EOSA, MS, HS, and CE.
- Course evaluations: SMILE Methods and Grades K-12 seminar.

Surveys

- Community Capacity: conversations with community partners, teachers and grantors.
- Community Partners: Community and Teacher surveys.

Student Artifacts

- Student field notebooks from EOSA.
- Student design prototypes from MS Challenge.
- Student created materials from HS Ocean Science Events.

Conversations and Focus Groups (staff, teacher, community members and parents)

- Community Partners: Conversations with teachers at TW.
- End-of-Year Evaluation: Conversations with SMILE at May TW.
- Community Partners: Community Survey, Teacher Survey and conversations at TW.

Metrics Program

- Number and demographics of students in SMILE Clubs.
- Number and demographics of SMILE teachers.
- Attendance at clubs and events.
- Number of participants at FMSN in each community.
- Number of parent/adult chaperones participating in events.
- Number of college student mentors.

We use an overall program theory of change/logic model to help us define program elements that directly help us achieve both our short and long term goals and outcomes (see appendix).

We have distilled the core concepts for student engagement in the "Content within a Community Context" framework. In this way we welcome students to the higher education learning community.

SMILE members and partners created a community puzzle to represent their new team and how it pieced together.





CREATING A COMMUNITY OF PRACTICE

Content in Context

The program design process of connecting content learning to an enriching context wherein students see the impact of their increased knowledge on a community. While somewhat akin to "Problem-based Learning", the enriching community context more broadly links the content to people and careers, and the enriching context supports not only their learning content but the application of knowledge through integrated skills and knowledge broadly defined as "21st Century Skills".

Action: Context and content are broadly defined.

Goals: Students use scientific inquiry and research methods; students understand how research supports an increase in knowledge; students develop skills and have experiences that encourage interest and engagement in learning the content.



Action: Content becomes more focused by the context.

Goals: Students use specific inquiry and research skills to interpret specific scientific data; students increase their knowledge within a more focused content area; and students develop assets that are needed to digest their learning (teamwork, communication and critical thinking).

Action: Specific problem or community challenge is defined, specific resources needed to address problem or need are provided.

Goals: Students apply problem-solving strategies; teams talk with each other to generate options and ideas; and students see that their knowledge may benefit the community.

Content in a Community Context

Action: Context becomes more focused by realistic community interests, needs or questions.

Goals: Students learn about "stakeholders" and their needs; students begin to link knowledge gained in above actions to context; and students are motivated to engage and learn and apply problem-solving strategies.



Action: Additional expertise is offered from scientists and other community experts.

Goals: Students meet STEM experts; connect the challenge to researchers and careers; students experience being members of a learning community as they engage with scientists, graduate students, undergraduate students, teachers, and community stakeholders; students begin to form recommendations to address problem or need and work with stakeholders to begin refining their ideas, trying out proposed solutions.

Action: Public forum held to allow students to communicate their solutions.

Goals: Students communicate data-grounded solutions to the broader community; students engage community by demonstrating that their knowledge makes a difference to the community; students develop a link between skills and knowledge and college, develop academic aspirations to be a more permanent part of this community and to attend college.

Critical Components of the College Connection Model

- Context for the application of skills and knowledge gained in SMILE clubs.
- Team-based data collection and problem-solving.
- Presentation to and sharing content with a public audience.
- Seeing science in a social context.
- Connecting this new understanding to their interests and aspirations.



CREATING A COMMUNITY OF PRACTICE

SMILE staff working with students at a Middle School Challenge at Portland Community College.



Creating a College-Going Culture

The program design process of connecting content learning to an enriching context wherein students see tOur Community of Practice is built and maintained upon the belief that "students who have the parental, school, and community expectations that college is the next step after high school, see college as the norm" (The College Board, 2006), and are far more likely to live within a college-going culture. SMILE has a history of working to nurture a college-going culture that "builds the expectation of postsecondary education for all students—not just the best students" (The College Board, 2006). As described by the College Board (2006), such a culture: "inspires the best in every student, and it supports students in achieving their goals".

Since its inception, SMILE has recognized the need to build a college-going culture within rural Oregon communities to engage public support, increase access to financial resources, and to develop connections with nearby community colleges and universities. We know that rural, minority, low-income, and female students "are more likely to face college planning obstacles because of social and language barriers, less access to information and guidance, less exploration because of low expectations, decreased access to the Internet, and underestimation of the amount of financial help available" (The College Board, 2006). Therefore, our clubs focus on these students to increase access to college by implementing effective programming that motivates and prepares these students, their families, and communities for higher education

A Sense of Membership

Participation in SMILE clubs provides a sense of being a member of the academy and helps students to feel as though they truly belong in a campus environment. Clubs participate in College Campus Events and Challenges based on community needs in STEM. These events allow students to experience college and begin to imagine themselves there. Divided into teams, students solve a problem together with support from their team's college student mentor, take campus tours, and even sleep on campus.

By developing this sense of membership within their clubs and with other SMILE students at Challenge Events, students learn to work together, to trust each other, and realize that often in life we must rely upon each other to succeed. SMILE helps students develop a work ethic, envision their future, foresee career options, and value education.



*"I liked the Middle School Challenge because [it] was the first time I slept over far from my house."
Shared by a student*





CREATING A COMMUNITY OF PRACTICE

Our students are positive about their achievements and aspirations based on being a part of SMILE. The student quotes below answered the questions "why is college important?" and "how did SMILE help you prepare for college?"

- College will have challenges that would take the brainpower of more than [one] person, so learning to participate in a group was quite invaluable.
- College will help me a lot and isn't as crazy as everyone thinks.
- I learned how to cooperate better [and that a] compliment always makes people feel good.
- [Helped me] to make new friends.
- Never stop learning.
- You must work hard to succeed.
- Don't be afraid to try new things.
- I will have a higher education and I will have a much wider variety when it comes to jobs.
- I want to have a good career and education.
- [College] will make me happy.
- I want to be successful.
- [College] prepares you for the future.
- Without it my life would be way harder.
- I care about my future.
- It will help you to get a good job and a good future.
- It gives you more choices in life.
- It will help me do the job I want and enjoy myself.
- It's fun.
- I want to go far in life.
- I have courage and a vision.
- A sturdy work ethic and a good sense of persistence to power through tough years.
- Always do your best and never give up.
- To try harder and work better with others.
- To always be dedicated and to use time wisely to always reach for my highest goals.
- I learned that college doesn't sound as intimidating as people make it sound. It sounds like a lot of fun and a great experience to make new friends.

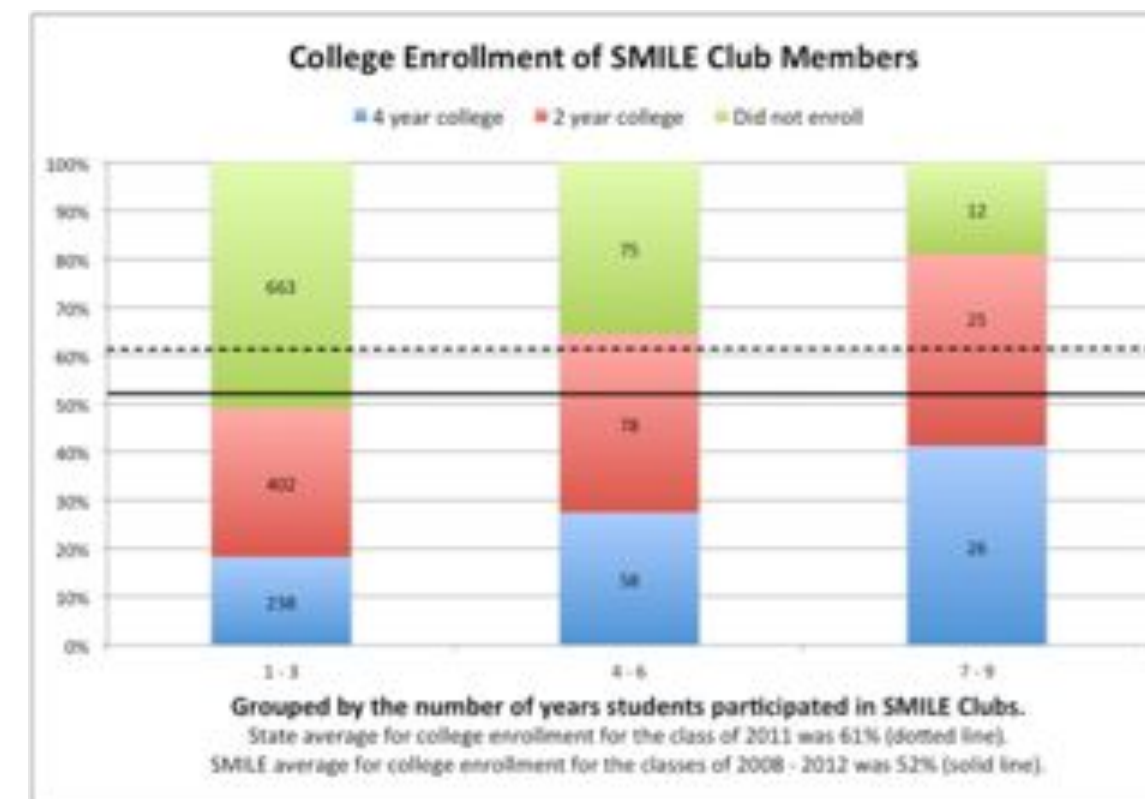
Once in the higher education system, SMILE students have high resilience because they feel as though they have permission to be there, that they belong, and that they know they can be successful. Comparatively, SMILE students' college dropout rates look like the Oregon average instead of the ethnic minority or rural student averages, which are often higher.



CREATING A COMMUNITY OF PRACTICE

College Enrollment Data

In the last year, based on data from the National Clearing House on College attendance, we have been able to deduce how many of our students registered in a reporting college. We submitted a list of students who could have graduated in the last five years--we track each student's expected graduation year as they enter our program regardless of when they join. For example, a fourth grader will graduate in nine years. We then compared this to the number of years they were in the program and this is displayed in the following graph. One concern we have had since the program's inception is that we need to change behavior and outcomes, not just recruit students who will already succeed. Our focus on students from first generation, low income and underrepresented minority groups reflects that we want to increase the number of students from these groups going to college--to fully plug the leaks in the pipeline to college for these students over the long term. To be in SMILE, a student must meet certain selection criteria: they must be getting C's or better in all their courses, they need to be interested in math and science, and willing to join SMILE. In addition, they must be a member of one of the focal groups--this specific group may change based on the demographics of our partner communities.



The data indicates that students selected for the program in the early years, look on average, very much like the cohort from the SMILE high schools--this is an average for all students in the partner schools. When we look at the four to six year data, we see a marked change and the college attendance rate now looks like the state average for all students. And note in the final column, we see both an increase in percentage of students going to two-year colleges and the continued increase in the percentage of students going to four-year institutions of higher education.





CREATING A COMMUNITY OF PRACTICE

We know our college-going community is becoming a reality, and penetrating multiple generations, when we receive feedback like the following parent quotes:

- Our oldest child is a SMILE Alumni and an Engineer for the Ford Motor Company. She contributes some of her success to SMILE and [her] education at OSU.
- As a SMILE Alumni, I am so thankful that my children are able to experience all that SMILE has to offer. I enjoyed SMILE as a student and was provided many opportunities that I would not have had otherwise and it excites me to watch my children be engaged in the program.



The college conversation becomes "What are you going to study" versus asking "are you going to go to college? As high school teachers have told us:

- The students get the idea that going to college is not a large 'if' but more of a 'when and how'.
- It encourages post high school education and supports minority students on that journey.



College student mentors volunteer to help engage students in a Middle School Challenge and answer questions about college.

Mentors as Role Models

Another key element of creating a college-going culture is a strong mentor program. Good mentoring programs enfold mentors with a concrete role to engage and support the youth. Over the years, we have built a strong collaborative nature with undergraduate students to work with our program. During our College Connection Events, undergraduate students from a variety of backgrounds function as mentors in a variety of ways. Each team of students is connected to a college student who is their team mentor. The mentor's role is not to provide an answer but to support team function as a coach and guide.



CREATING A COMMUNITY OF PRACTICE

Mentors also serve an important role as college student models. The goal of the SMILE Program is to encourage participation and success in higher education for the SMILE club students, and meeting and interacting with a successful college student is a critical connection for many, as they often do not have many college role models in their families and communities. In many cases the mentors are co-learners, as we recruit students who have a career interest in STEM fields, and want to share their passion with others.

As the following quotes demonstrate, SMILE students who attend OSU often look forward to giving back to the program by becoming mentors themselves.

- I am going to OSU next year [and] I want to be a mentor so I can continue being a part of SMILE.
- After being a student member of SMILE and getting a lot of support and just wonderful experiences in the program, I wanted to give back to SMILE and help other students.
- I've been looking for more experiences working with kids. I am also highly interested in promoting more girls to be interested in science and mathematics.

Furthermore, mentors play a significant role by portraying their confidence as a current college student. SMILE students often feel safe asking college mentors questions that they may not feel comfortable asking anyone else. For example, students have asked mentors such questions as: "Do you get into a lot of fights in college?"; "Will they like me?"; and "Do I belong in college-none of my friends or family are/were in college?". Being able to express their concerns and get a real-life perspective from a trusted mentor helps students let go of some of their fears around entering college.



During a Portland Community College campus event, middle school students ask mentors tough questions such as: "Are you bullied a lot at college?" and receive honest answers with positive strategies for handling difficult situations.





CREATING A COMMUNITY OF PRACTICE

High school teachers' answers to evaluation questions that asked "what do students gain from our Campus Challenge Events" show a theme in regards to the important role of mentors:

- Seeing a college campus, [and] meeting students like them[selves] in college is so important.
- Sharing of college experiences from college students.
- The ownership that comes from community planning [and] working with mentors.
- Touring campus and interacting with mentors/peers.
- The best experience was working together to create their community. Also, as usual, working with the university mentor is a lasting memory.
- Excellent. I think it is good for my students to meet with college students and to be exposed to two different universities.



Fun to Learn

Students must have fun and enjoy what they are doing to help maintain intrinsic motivation to want to go to college, to work hard, and to keep their grades up for college. SMILE clubs provide the safe, fun environment that is so easy to recognize by the noisy buzz of excited students, the dynamic nature of the activities, and the overall involvement of students during club activities. We also recognize that students are having fun through our annual evaluations given to students at the end of the school year.



Middle school student enjoys herself during a Challenge Event at Portland Community College.



Students have fun while learning how scientists conduct water chemistry tests in the field.



PROGRAM FRAMEWORK

Essential Attributes

Leveraging our successful model to increase the number of programs engaging underrepresented and underserved students in STEM activities requires a dedicated community of practice that is committed to the SMILE set of values and norms that we refer to as our program's essential attributes. These are ingrained in every staff member, teacher, student, mentor, partner, and community. Our essential attributes are crucial to our success. They set the tone for clubs and programs that allow students to take risks in a safe and encouraging environment, be creative, be respected, hold themselves and each other accountable, and accept the idea that it is indeed okay to be smart. It is our responsibility to ensure that everyone who inhabits the SMILE community is equally committed to our essential attributes because these attributes sustain our positive and effective work.

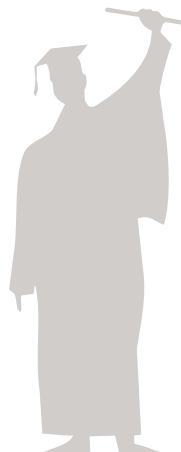


Essential Attributes of High Quality Programs (adapted from the University of Arizona):

- Strong sense of physical and psychological safety.
- Inclusive community.
- High expectations.
- Positive attitudes.
- Cooperative contributions.
- Personal Connections.
- Learning about learning.
- Creativity.

Student evaluation quotes demonstrate that clubs are a fun place to be after school, may even keep them out of trouble, and help them keep their grades up to maintain club eligibility.

- It helped me think about science and math more.
- It helped me with math.
- By helping me better understand math and science.
- I love it a lot and I love learning new stuff everyday we were in SMILE.
- SMILE is the greatest thing in my life. I love it so much.
- It helped me get along with people better.
- It helped me in science and math.
- It helped me not get shy when I have to read something in front of the class.
- It taught me to be nicer to other kids and more about science.
- We made predictions and hypothesis so it helped me in writing.
- If you do not have good grades then you can't go so I kept my grades up.
- By helping me in science.
- This is the first year I have been in SMILE and I really enjoyed it. I highly recommend it to next year's sixth graders.
- SMILE is a great place to be after school and I wish it were everyday instead because it gives you something to do instead of being lazy at home and it keeps other kids from getting into trouble after school.
- Social skills and learning.
- It was really fun.
- I love SMILE.
- It is pretty awesome.
- I love SMILE it is so much fun.
- It is the best after school activity ever.
- I hope they have SMILE at my new school.
- It was so much fun building things.
- SMILE is the best.
- I like SMILE because it helps me.
- I got better grades.





PROGRAM FRAMEWORK

Developmental Gains through Time Move

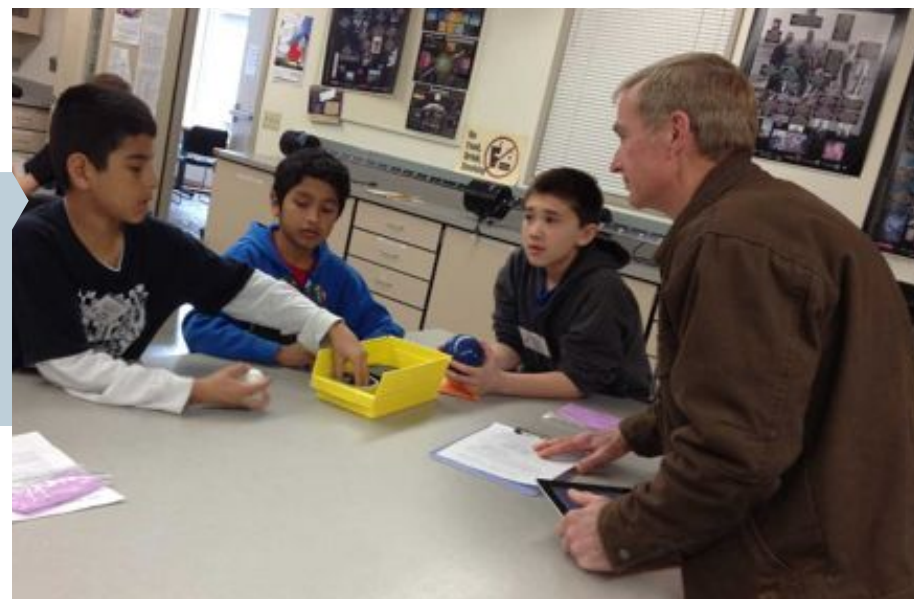
The main goal of the SMILE Program is to open the door to college and help ensure equal access to underserved and traditionally underrepresented students, so that no matter what a student's socio-economic, cultural, or geographic background they can have a bright future. Over the years, we have perfected our developmental programming to meet students where they are at--academically and socially--to ensure that college can be a reality in their future.

Developmentally appropriate learning opportunities at the elementary, middle and high school levels support an ongoing focus on and progression toward the four core standards in Oregon's science standards. Core content standards under Structure, Function, Interaction and Change describe the big ideas in the three disciplines of physical science, life science, and earth/space science. The core content standards in Scientific Inquiry and Engineering Design describe the science process skills and understandings that characterize the nature and practice of science and engineering design. Our clubs and programming are designed to reflect the following three levels as students continue on their road to college:

Elementary School: "Becoming Scientists"

In becoming scientists, fourth and fifth grade students demonstrate skills and attributes that enable them to:

- Make careful observations.
- Demonstrate the use of tools to enhance their observations and improve their accuracy.
- Connect their understanding of relevant content to predictions about results and/or changes in the system.
- Work as a member of a team.
- Share what they learned with others.



Elementary students learn about physics with their club leader during a Campus Connection Event.

*"There is always one moment in childhood when the door opens and lets the future in."
Graham Greene*



PROGRAM FRAMEWORK

Middle School: "Growing into Problem Solvers"

To grow as problem solvers, sixth through eighth grade students demonstrate additional skills and attributes that, added to those gained above, enable them to:

- Identify a need or define a challenge within a community.
- Frame the above problem and then break it into smaller components that foster learning and investigation.
- Have an increasing "toolbox" of skills, methods and measurement tools, and understanding of their use as resources used by scientists in investigations.
- Connect their understanding of relevant content to the problem and its possible solutions.
- Experience the role of teams in generating a variety of options or ideas to address the identified problem.



Middle school students work together in teams and with their mentors to solve a challenge.

High School: "Emerging as Informed Voices in the Community"

To serve as informed voices in the community, ninth through twelfth grade students demonstrate additional skills and attributes, adding to the two stages above that enable them to:

- Understand the nature of their community and its needs, define broader problems and identify potential solutions.
- Use evidence and science content to enhance their observations and improve their accuracy.
- Connect their understanding relevant science content to the needs of and possibilities for a community.
- To formulate and deliver a persuasive presentation that shares related science content and possible solutions with interested stakeholder.



Readers' theater presentation at a High School Challenge where students performed as fishermen in their charter vessel. Their story is about responsible fishing practices in regards to nets, ocean debris and proper equipment management.





PROGRAM FRAMEWORK

Supporting the Role of Teachers

SMILE brings program leaders and teachers to OSU for professional development workshops to develop and deliver high quality programs. These workshops provide training in culturally sensitive pedagogy, developmentally appropriate curriculum, and resources to facilitate after school science and math clubs in their school. They are increasingly focused on community projects that help teachers connect students in the clubs to local partners and stakeholders who collaborate with students on projects designed to benefit the community.



Teachers receive specialized field training at H.J. Andrews Experimental Forest in Blue River, OR.

Our workshops are very powerful because they are often the only professional development source for rural teachers. The workshops allow them to keep their continuing education credits up to date, participate in a learning community that offers friendship and support, stay up to date on STEM content, and continue to inspire students. Teachers are engaged as co-learners and co-leaders as part of the SMILE learning community.

Workshops extend the reach of SMILE because by participating in our professional development workshops, teachers affect all of their students, not just those in the clubs.



Teachers at a professional development workshop.

Teacher Quote: "[I was] so excited to get the Messy Chemistry binder and share it with others. Great activities and they're super fun. This is getting back to what I love best about SMILE, getting activities ready, to take home, with practice using them."



CONCLUSION

Ninety percent of our parents want their kids to continue in the SMILE Program and give us feedback that lets us know we are indeed changing the community culture so that high school is no longer seen as the end (most of the other ten percent are the parents of graduating seniors for whom there is no next year in SMILE).

- If there was a program like this when I was in school, I probably would have graduated and [gone] to college. College seems to be a whole new world. High school just seemed like it was the end.
- My child is a foster child and the sense of pride they have being a member and talking about it with case workers, judges, and parents-[SMILE] would be proud. My adult children were in SMILE. And [it] is so important for my foster children. [SMILE] helps them feel centered and connected to the bigger educational world.

In twenty-five years SMILE has:

- Served approximately 7,500 students directly through our after school clubs.
- Involved over 370 teachers as club leaders.
- Impacted over 11,000 students a year in the classroom by training their teachers in STEM-based, hands-on professional development workshops.
- Seen an average student persistence rate of three and a half years in SMILE clubs.

In the last ten years we have recognized 440 students who earned their five-year award. We also recognized sixty-two students who earned their nine-year award, meaning they were in the program for the entire duration of fourth through twelfth grade.



High school SMILE seniors receive their nine-year participation awards from Program Leader Ryan Colloy.

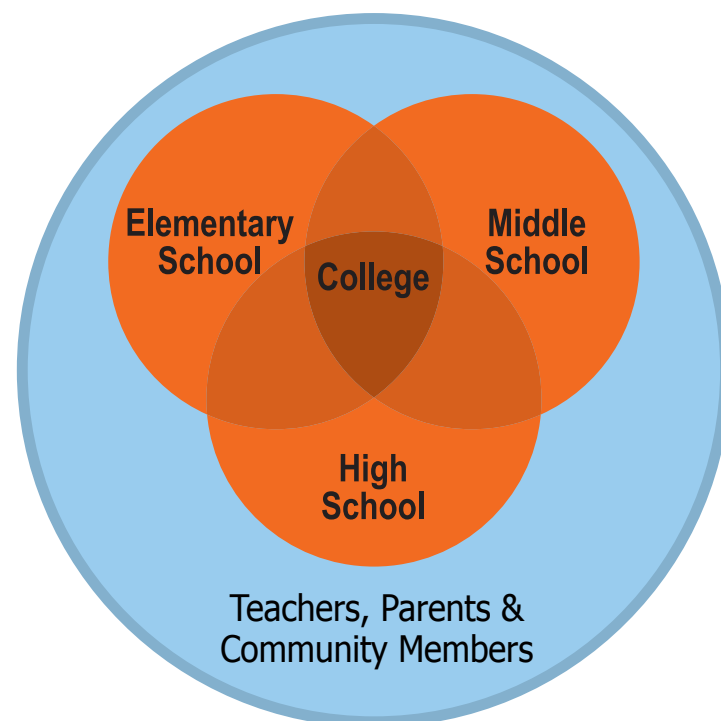


CONCLUSION

AWARD HIGHLIGHTS

- 1999 Mentoring Excellence: The Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring presented by The President of the United States of America (William Clinton, 1999) to SMILE for embodying excellence in mentoring underrepresented students and encouraging their significant achievement in science, mathematics, and engineering.
- 2012 Together for Tomorrow: SMILE was one of 24 organizations honored by the U.S. Department of Education and the Corporation for National and Community Service as “Together for Tomorrow Challenge” winners for the 2012-13 school year. The award recognizes community-led partnerships to support struggling schools. SMILE was the only statewide, STEM-focused rural program honored.

Over the past twenty-five years SMILE has created a college-going culture in mostly rural Oregon that increases access to college for underserved and underrepresented students. Due to our longevity and sustained nature of our program we have been able to have long-term impact on our communities. In fact, we now have SMILE students returning to their communities as SMILE teachers, which perpetuates the college-going culture. Students who return to their rural hometowns play an important role in modeling success as a college graduate and helping to boost the local community. Parents that were in SMILE have their own children in SMILE, breaking the barrier of being the first to go to college. Families and communities now expect their youth to go to college, know that it is possible, and that students can succeed in higher education and beyond.



APPENDIX

SMILE Overview and Accomplishments

The Science & Math Investigative Learning Experiences (SMILE) Program

SMILE is a university-school-community partnership that promotes precollege STEM enrichment and college readiness focused by the need to increase the number of historically underrepresented and other educationally underserved students who graduate high school prepared to enter and succeed in higher education and pursue careers related to mathematics, science, engineering, health-care, and teaching. SMILE realizes its impact for youth through early, sustained engagement and long-term relationships with significant adults. SMILE's comprehensive, integrated approach requires:

- Educational programming to support underrepresented and underserved youth.
- Sustained relationships with classroom educators who serve as program leaders/club advisors and who improve STEM education in underserved rural schools.
- Long-term partnerships with underserved rural schools increasing student academic success and college readiness.
- Engagement of a diverse cadre of university students, faculty and program partners.
- Leadership within the outreach and engagement professional community.

Reaching Students

We had over 650 youth, grades 4-12 in SMILE clubs in 33 schools in 2012. We have served over 7,500 students in 25 years. The collective demographics of these students are:

- 50% Latino, 25% Native American, the balance are first generation/low Income white.
- 62% female, 40% male.
- Average membership in the club is 3.5 years.

Participation

- 97% of club members complete the year.
- Students average 3.5 years with the program, in 2012 we had four students with nine years.

Serving Teachers

We have served over 370 teachers and currently serve 52+ classroom teachers who serve as club advisors. The average teacher has been with the program for 8.5 years.

- We provide teacher professional development workshops focused on increasing teacher's science and pedagogical content knowledge.
- We increase content competency and support life-long learning in STEM.
- We support engagement pedagogy and academic enrichment.
- We support classroom practice through support for best practices and content standards at the TW's and their practice in the clubs.

Students with two or more years graduate from High School at a higher rate than the overall student population in Oregon (85% vs 75%) and students with four or more years graduate at a rate above 90%. Of the graduating seniors, over 90% go to college their first year after high school. While we do not have college graduation rates for all our students, those students who attend OSU look (GPA, retention rates) like an average incoming student and this rate is substantially higher than the rates for incoming minority/first generation students.



APPENDIX

Program Highlights

Science & Mathematics Investigative Learning Experiences (SMILE) Program at Oregon State University *"Envision...Believe...Succeed..."*

The SMILE Program:

- Founded in 1987, is currently in its twenty-fifth year of operation in Oregon, with partner programs in their nineteenth year in Rhode Island, and in the second year in Maryland.
- Supports the education and service mission of the University, with special emphasis on outreach, enrichment, and diversity focused on college access and equity.
- Links Oregon State University with 13 communities and 12 school districts through annual contracts defining our collaborative services and programs.
- Operates with support from the State of Oregon and various granting agencies and organizations including: corporate support, foundation funds, and federal grants.
- Is the recipient of the 1999 Presidential Award for Science, Mathematics, and Engineering Mentoring, and the Together for Tomorrow award from the Federal Department of Education and the Corporation for National and Community Service in 2012 for outreach to Oregon's least served schools.

Program Impacts:

- Expects a current year enrollment of more than 650 students; having served over 7,500 students from minority, low income, and/or first generation to college.
- Reaches over 11,000 students impacted annually in classrooms of our fifty-five partner teachers, grades 4-12.
- Currently supports 50 SMILE teachers in 33 schools focused on STEM enrichment, College and Career Readiness, specifically supporting access to higher education for underrepresented youth.
- Has supported more than 360 rural classroom teachers professional development workshops in science, technology, engineering and mathematics (STEM).
- Over 65% of our students with one or more years in SMILE went on to college their first year after graduation, with over 95% of our seniors attending college their first year.
- Provides an arena in which OSU faculty and students serve as expert resources and mentors for underrepresented and underserved students.
- Provides scholarship support to former SMILE students at OSU and since 1993 has awarded more than \$300,000 in scholarships.

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smile.oregonstate.edu



APPENDIX

Partnerships

The following is a highlight of our partnerships and funders. By no means is it meant to be an exhaustive list as many individuals and organizations have contributed over the years. We appreciate all of our supporters, schools and partners as they make our work possible.

School Districts (SD) with Clubs in Parenthesis:

- Beaverton SD (Inactive: Vose ES, Beaver Acres ES, Kinnaman ES, Highland Park MS, Meadow Park MS, Sunset HS, Westview HS)
- Dayton SD 8 (Dayton ES, Dayton MS)
- Forest Grove SD 15 (Neil Armstrong MS, Forest Grove HS)
- Hillsboro SD (Inactive: JW Poynter MS, JB Thomas MS, Hillsboro HS, Glencoe HS)
- Jefferson County SD 509J (Warm Springs ES, Jefferson Co MS, Madras HS)
- Klamath County SD (Chiloquin ES, MS, HS)
- La Pine SD (Inactive: La Pine MS)
- Lincoln County SD (Toledo HS)
- Nyssa SD 26 (Nyssa ES, MS, HS)
- Ontario SD 8C (May Roberts ES, Ontario HS)
- Pendleton (Inactive: Washington ES, Sunridge MS, Pendleton MS, Pendleton HS)
- Sage Community Charter School (MS)
- Siletz Valley Charter School (Siletz Valley ES, MS)
- Siletz Valley Early College Academy (Siletz Valley HS)
- Siletz/Toledo SD (Inactive: Siletz K-8 ES, MS)
- Sisters SD 6 (Sisters MS)
- Three Rivers SD (Evergreen ES, Lorna Byrne MS, Illinois Valley HS)
- Willamina SD 30J (Willamina ES, MS, HS) (Inactive: Grand Ronde ES)
- Woodburn SD 103 (Lincoln ES, French Prairie MS, Valor MS, Woodburn HS) (Inactive: Heritage ES)

Corporations and Foundations:

- America Honda Foundation
- ARCO Foundation
- AT&T
- Benjamin Franklin Federal Savings & Loan
- Captain Planet Foundation Inc.
- Center Foundation Ortho & Neuro Center Cascades
- Century Club
- Chambers Family Foundation
- CH2M-Hill
- Chevron USA
- Confederated Tribes of Siletz
- Demorest
- General Electric
- Greenville Foundation
- GTE and the GTE Foundation
- Hanlon Foundation
- Hewlett-Packard
- Howard Hughes Medical Foundation
- IBM Corporation
- JELD-WEN
- Lorene Sails Higgins Charitable Trust
- Mentor Graphics Foundation
- MJ Murdock Charitable Trust
- NIKE Corporation
- Oregon Community Foundation: Howard Vllum American Indian Scholarship Fund, Robert W. Chandler II Fund, Fred W. Fields Fund
- Oregon Freeze Dried
- Pacificorp
- Pope and Talbot
- Portland General Corporation



APPENDIX

Partnerships

Corporations and Foundations:

- Siletz Tribal Charitable Contribution Fund
- Spirit Mountain Community Fund
- Starker Forests
- Tektronix
- Tektronix Foundation
- US West
- W.K. Kellogg Foundation
- Zonta Services Foundation of Corvallis



State Contributions:

- State of Oregon Lottery
- Oregon Department of Education
- Oregon State University and their students, faculty, and staff
- Oregon University System: Engineering and Technology Industry Council
- Western Oregon University: Teaching Research Institute
- Eastern Oregon University and Dr. Donna Rainboth
- Southern Oregon University and Dr. Peter Wu
- Oregon Extension Service and 4-H

Federal Grants:

- Dwight D. Eisenhower Mathematics and Science Education Program
- National Aeronautics and Space Administration
- United States Forest Service
- National Institute of Environmental Health Sciences (NIEHS)
- National Institutes of Health in partnership with Oregon Health & Science University & University of Pennsylvania
- National Science Foundation
- National Oceanic and Atmospheric Administration
- Science Education Partnership Award (SEPA)
- United States Department of Energy
- Environmental Protection Agency
- U.S. Department of Agriculture in partnership with the University of Washington

Equipment Donations:

- American Power Conversion
- Apple
- Firmware Systems
- Hewlett Packard
- HyPerFormance
- IBM
- Microsoft
- Oregon Community Foundation: A. Ted & Doris Nelson



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Together for Tomorrow Grant

OSU Article to Celebrate SMILE's National Recognition

OSU's Science and Mathematics Investigative Learning Experiences (SMILE) Programs celebrate 25 years, receive national award 11-9-12

CORVALLIS, Oregon -- An Oregon State University program known for helping underrepresented youth pursue careers in the sciences has just completed 25 years of serving rural communities. And it has also just received a national award for its work.



The Science & Math Investigative Learning Program, or SMILE, provides educational programming for underserved youth, and professional development and support to grade and high school teachers in 36 rural schools in Oregon. Classroom teachers serve as after-school club advisers, providing a curriculum to participating students which emphasizes science, technology, engineering and math, known as STEM.

Of the 700 now enrolled in SMILE, 85 percent are Latino and Native American, and the rest are low-income or first-generation white students. They all benefit from support in the areas of math, science and technology linked to college and careers.

Last month, SMILE was one of 24 organizations honored by the U.S. Department of Education and the Corporation for National and Community Service as "Together for Tomorrow Challenge winners for the 2012-13 school year. The award recognizes community-led partnerships to support struggling schools. SMILE was the only statewide, STEM-focused rural program honored.



More than 7,500 students have participated in SMILE over the last 25 years. SMILE provides college connection events and a summer bridge program for its graduates attending OSU, and hosts middle and high school challenge events that bring younger students together from across Oregon to engage in science- and math-related activities and challenge-solving exercises.

SMILE doesn't just increase math and science skills. It also increases the chances that students will graduate from high school and go on to college. Eighty nine percent of SMILE graduates go onto college, compared to 65 percent of their peers. And SMILE also increases the likelihood that a student will graduate from high school. The state average for high school graduation is 75 percent. Students with two years in SMILE graduate at a rate of 84 percent, and those who spent four or more years in SMILE graduate at a rate of 95 percent.



For some rural programs, SMILE has created new possibilities for the entire district. In Nyssa, Ore., for example, SMILE instructor and high school science teacher Ken Dickey said since SMILE has been introduced two decades ago, college is now a realistic goal.

"After many years of investment in SMILE, our students know that they really can go to college and succeed if they develop the right attitude and put in the effort," Dickey said.





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“Their older brothers and sisters, their cousins and friends have already proven it so.” SMILE assistant director Ryan Collay says that SMILE is not a stand-alone program. “Our function is (to serve) as glue that binds people together.”

Those people are teachers, school administrators, family members, leaders from OSU programs and other entities that all lend their support, aid and time to making the SMILE program thrive. Collay sees SMILE’s biggest successes in developing and facilitating mutually beneficial relationships between entities with similar goals, but less capacity to reach students.

“We work with the least-served schools because they are the least likely to gain any other services,” said Collay. SMILE staff looks for partners to amplify their own offerings, with both funding and expertise that greatly expand what SMILE could do on its own.

Some of SMILE’s regular partners include GEAR-UP (Gaining Early Awareness and Readiness for Undergraduate Programs), the Oregon University System’s Engineering and Technology Industry Council (ETIC), and the College Access Network.

With help from research partners such as the NOAA-funded Cooperative Institute for Oceanographic Satellite Studies and Oregon Sea Grant, they’ve developed ocean-based curriculum for high school students. Howard Hughes Medical Institute grants have funded many of their activities, and the Oregon Natural Resources Educational Program in the OSU College of Forestry has also been important, along with numerous other partnerships. They are part of an innovative education collaborative funded through the USDA in bioenergy research and education.

Jo Oshiro, program coordinator for ETIC, said SMILE raises the bar for students and teachers in the communities it serves.

“SMILE has been a great partner for us in spreading the details of how to implement successful youth development programs in academics, sharing successes and challenges with other programs,” Oshiro said. “Their work on bringing engineering – the process, the discipline, the colleges, the career – to middle school students has been way ahead of the curve on the STEM education you hear so much about these days.”



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National Science Teachers Association Report

National Science Teachers Association NSTA Reports
Connecting K–12 STEM to College, After School
3/12/2013 - NSTA Reports—Debra Shapiro

The ACPHS Academy, a STEM after-school program of New York's Albany College of Pharmacy and Health Sciences (ACPHS), enrolls inner-city students in grades 3–12.

After-school science, technology, engineering, and math (STEM) programs are offered at many schools around the country, but most involve just a few grade levels and are run by the schools. However, some after-school STEM programs proving beneficial to students—especially under-served students—are held by colleges or universities for local students from elementary through high school levels. “There is a strong body of research that says getting students excited about learning at a young age will positively impact their career interests and decisions later in life. Our approach is to begin with students in the third grade, work on building their core STEM skills through elementary and middle school, and continue to nurture their development through high school,” explains Rebecca Beach, director of the ACPHS Academy, a program of New York’s Albany College of Pharmacy and Health Sciences (ACPHS).

Every fall, the ACPHS Academy enrolls a class of 20 third graders from Albany’s inner city, and that class continues together in the program through high school. “The hope is that these students will pursue careers in STEM-related fields, but more importantly, we want to see them graduate from high school, attend college, and enjoy successful and productive careers,” Beach maintains. “We are even committed to offering a scholarship to our school for any student who successfully completes the program, applies, and is accepted by the college.”

In the SMILE (Science & Math Investigative Learning Experiences) Program, offered in Oregon and Rhode Island, students begin attending in the fourth grade and can continue through 12th grade. “SMILE clubs meet weekly throughout the school year for integrated math and science activities designed to build a cohort of interested and excited students,” says Carol Englander, SMILE’s director at the University of Rhode Island (URI) in Kingston. “By maintaining the continuity of students’ exposure to and support for learning science and math, we are creating a clear pathway to higher education for motivated and prepared students,” she adds.

“We are just beginning to appreciate and articulate what students gain at each stage” of the pipeline to higher education, observes Ryan Collay, SMILE’s assistant director at Oregon State University (OSU) in Corvallis. At the elementary level, the program focuses “on fun, a community, enhancing interests, getting students to see how increased knowledge helps them understand the natural world, how developing their math skills is fun,” he explains. At the middle level, “we add role models, a sense of community where school is cool, where you gain power and influence because you know something, developing contextual team-based challenges that link [students’] problem-solving abilities to making a difference.”

In high school, says Collay, “we add increased responsibility and capacity, a sense that each person brings to the table a valuable set of skills—a diverse set.





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We develop the context, the systems thinking, and add this to more ideas for college and careers. And of course, the pragmatics of being college-ready. But the most important step is seeing oneself as "college material."

The ACPHS Academy reinforces the idea of being "college material" by busing students to and from the college's campus, so they are literally "going to college." The program provides meals for them on campus, and ACPHS hosts "special events [for them], such as our annual science fair," says Beach.

SMILE students visit OSU for what Collay calls "'College Connection' events, such as our middle school Engineering Design Challenge, or the high school event [in which] they learn about a topic in ocean science and apply their knowledge to an issue or concern."

At URI, elementary students "attend the three-day Elementary Outdoor Science Adventure camp, where they engage in environmental project-based learning activities. SMILE middle and high school students attend the Engineering Challenge Weekend, [during which] they are mentored by URI engineering professors and engineering majors," explains Englander.

Student mentors play key roles in these programs. At the ACPHS Academy, students benefit from "a mentor who can answer questions and help steer them along in their projects. It's like having 15 additional teachers in the classroom," contends Beach.

Students "also get the chance to talk to their mentors about the college experience. They get the opportunity to experience a real college campus setting early on," says mentor Chelsea Travis, a second-year pharmacy student.

Club Benefits

What do students gain from these programs? "The demands of the school day mean that teachers and students do not always have the opportunities to get into hands-on, real-life exploration of STEM concepts and ideas. At the Academy, we provide the time, space, and materials needed to do just that," responds Beach.

SMILE offers "a club atmosphere where participants feel valued and supported. Additionally, students appreciate learning and education, so there is a culture of inquiry and ambition. Unlike the regular school day, the focus is on the learning process rather than the end result, such as test scores," Englander contends.

Students "learn that their interests in science and mathematics are something they share in common," says Collay. "And foundational for our students is the sense of membership in something that matters...a place, as one of our students noted, 'where it is okay to be smart'."

While much "of informal learning does not intentionally link to classroom learning," he adds, in SMILE, "in part by design and in larger part by the role of classroom teachers as club advisors, we intentionally link the learning...to the classroom. For if we can provide a reason, a context for learning, for the application of skills and knowledge gained in the classroom, we have improved the classroom learning through the club experience."



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Students also benefit from SMILE's teachers, who "act as coaches in that they track student grades and intervene if necessary, make sure students take four years of college-track math and science in high school, and assist with college applications," Englander notes.

SMILE and the ACPHS Academy reward teachers with stipends. In addition, "SMILE Teacher Leaders participate in professional development workshops three times per year to learn new science and math curriculum," says Englander. SMILE provides teachers with interactive, hands-on learning modules that have been tested, and SMILE staff members and "URI resource faculty provide an ongoing support system that will help teachers to improve content knowledge and pedagogy, connect real-life experiences to curriculum activities, and increase their professional confidence and competence," she points out.

"We are also very supportive of educators as professionals," affirms Collay. "Some of our discussions address concerns they face in learning about new things," such as the Next Generation Science Standards (NGSS), he notes. "In many ways, [the NGSS] are strategies we have [already] used: systems and computational thinking, problem-based learning, engineering design, and of course, inquiry in interdisciplinary and contextual learning environments...So [SMILE teachers] are well ahead of the curve as far as the intent and philosophy of the new framework: It links up nicely with our program framework."

"When I was hired as a science teacher 20 years ago, the principal expected me to take on the SMILE program," remarks Ken Dickey of Nyssa High School in Nyssa, Oregon. "I was happy to do so because I knew it would give me a chance to be valuable to students outside of the classroom. As a stranger coming into the school, I knew it would be important to make connections with students beyond the school day."

Achieving Results

"We have collaborated with [more than] 350 teachers and reached [more than] 7,500 students from small/rural communities underrepresented in higher education in Oregon" over the past 26 years, Collay estimates. "Of these students, 85% are from underrepresented minority groups, with the balance [being] first-generation, low-income white students. Since our inception, [more than] 60% of our students have been female."

Englander notes that the more time students spend in SMILE clubs, the more likely they are to graduate high school, attend college, and major in STEM fields.

Over the past two years that data is available, says Beach, 87% of ACPHS Academy students received the highest possible score on New York's fourth-grade science exam. In comparison, only 44% of students in the Albany City School District and only 54% of all students in New York's public schools attained this benchmark.

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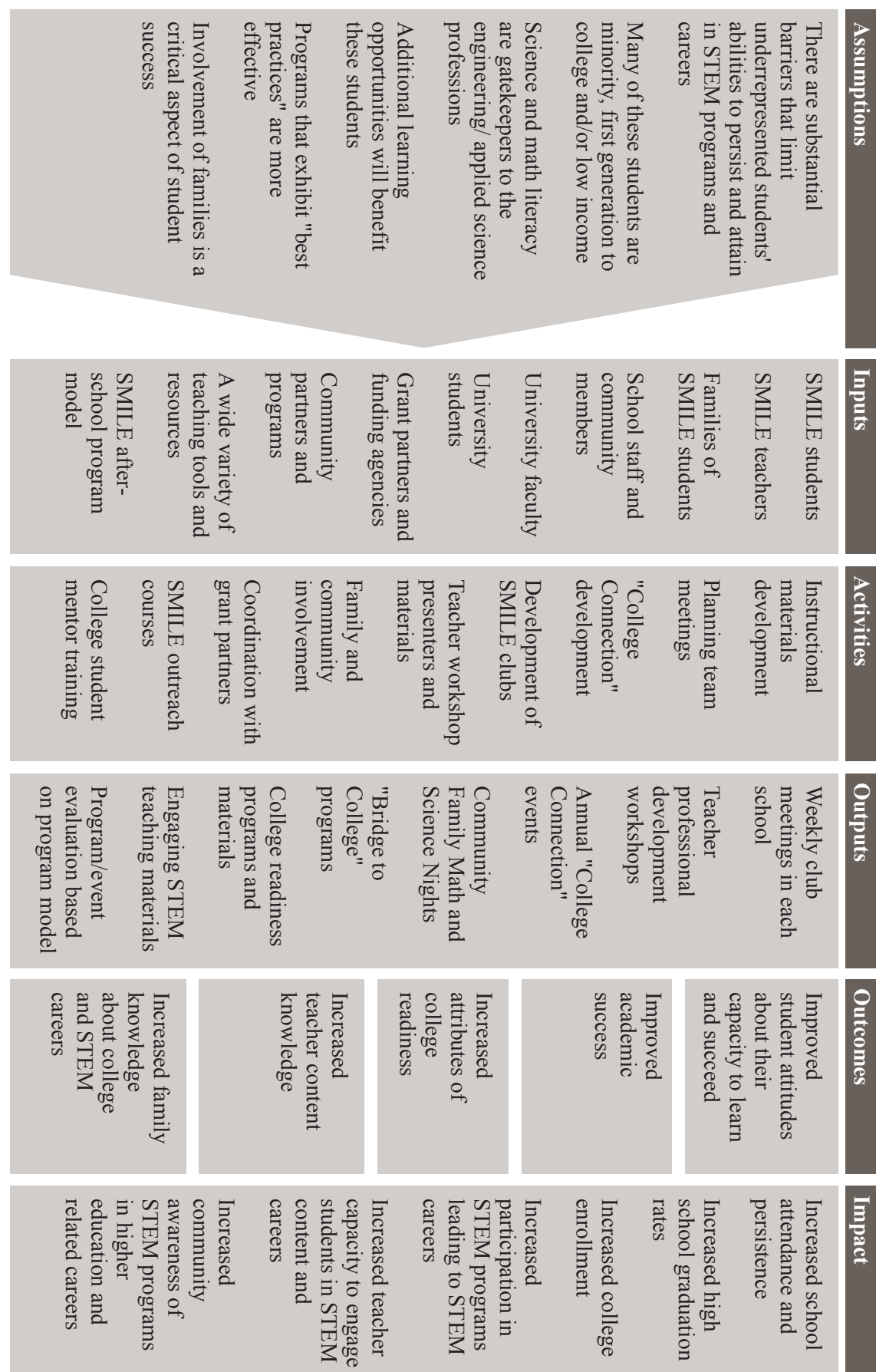
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SMILE Program Theory of Change/Logic Model



The SMILE Program Theory of Change