impact

University of Idaho Extension programs that are making a difference in Idaho.

Professional development for teachers helps youth learn how to think, not what to think

AT A GLANCE

Training helps teachers increase their confidence and competence in teaching quality STEM in and out of the classroom.

The Situation

University of Idaho Extension 4-H Youth Development programs, Think Make Create (TMC) Labs in partnership with the Idaho Out-of-School Network was developed to bring science education directly to Idaho's teachers and youth. The labs are fabricated trailers that provide a mobile platform to engage youth with hands-on STEM (science, technology, engineering and mathematics) learning and career exposure through maker space opportunities and tinkering in school, after school and out-of-school activities. The goal of TMC labs is to provide sustainable STEM learning environments to rural and underserved populations in Idaho. With a network of 28 trailers embedded throughout rural and tribal communities, there is an opportunity for classroom and out-of-school teachers around the state to participate in STEM education professional development.

Our Response

In partnership with the State Department of Education and the Idaho Out-of-School Network, University of Idaho Extension 4-H Youth Development created a training module template that is tailored to communities around the state. A preliminary needs assessment showed that teachers need the tools on how to teach

Participants at a Twin Falls training working together to grow STEM education in their communities.

STEM and they need to build their confidence. The TMC labs' professional development focused on those two areas of growth: competency and confidence.

This robust training centered on how to deliver hands-on STEM learning, using the Think Make Create Labs, the Idaho Science Content Standards, the Science and Engineering Practices and the Experiential Learning Model. Collectively these tools help teachers competently plan and intentionally create a high-quality STEM learning environment for youth.

Using content standards, teachers create opportunities for youth to hear and learn consistent terminology — in and out of the classroom. Content standards also help teachers build learning goals and objectives, allowing them to adapt STEM activities to best fit youth

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learning needs. In each training session, teachers learn about the TMC lab materials available. TMC users also learn how to connect and work together with community partners to provide fun, engaging, hands-on activities.

TMC professional development also addresses how teachers can help youth make sense of our physical world, as opposed to just memorizing facts. For example, youth are provided with craft sticks, tape and binder clips, and are tasked with creating an item that can hold a book longer than one minute. Often working in small groups, youth learn to communicate with each other, solve problems by asking questions, then figure out how to build a model to help them plan out their investigation. Next, the youth will interpret the results of their build, run the initial test and design an explanation on why things happened the way they did. The above are science and engineering practices, which allow the youth to see things in action. It allows teachers to confidently create an environment that welcomes youth voices and allows them to apply the skills they are developing in quality learning environments, such as problem solving, analyzing and evaluating data, or even communication.

By focusing on 1) teacher competency in teaching STEM, 2) building confidence in creating STEM learning environments, and 3) hands-on experience with the TMC lab materials and resources, training participants were able to do the activities while planning how they would integrate the methods into their teaching. Additionally, time was included for training participants to share and collaborate with other attendees to leverage local resources by forming new partnerships.

Program Outcomes

In the last three years, Think Make Create (TMC) Labs have reached over 525 in-school and out-of-school teachers in over 40 professional development training sessions across Idaho. Training participants were evaluated on their knowledge of delivering quality STEM education as well as their confidence in providing STEM learning environments. Evaluation results from training participants averaged the results below.

Increased knowledge in	Percent
Understanding 3-Dimension learning and cross-cutting concepts	36%
How to reach a STEM learning goal	32%
Selecting quality STEM lessons	31%
Building ways for youth to test and refine skills and practices	27%

Increased confidence in	Percent
Where to find TMC resources	36%
Knowing who to contact with TMC questions	32%
Having the tools necessary to create quality STEM learning environments	31%
Understanding how to collaborate with partners with delivering STEM education	27%

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FOR MORE INFORMATION

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