State STEMworks Partnerships
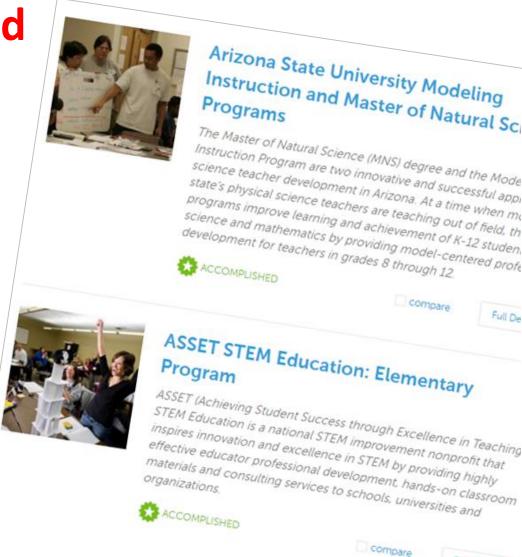
{CHANGE THE EQUATION} ™

What is Change the Equation?

- National 501 (c) (3) Nonprofit to ensure **all students are STEM literate**
- **Non-partisan** and independent
- Supported by **CEOs of major companies** operating in the U.S.
- Focus on scaling the **best programs and strategies**

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1

What is STEMworks?

- **Rigorously-vetted** programs

- Tool to **raise ROI**

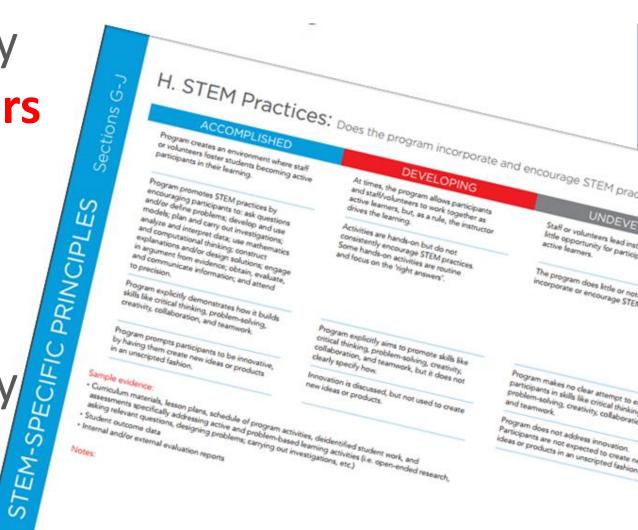- **Careful third-party** reviews

- **Profiles** of top programs

Arizona State University Modeling Instruction and Master of Natural Sci Programs

The Master of Natural Science (MNS) degree and the Mode Instruction Program are two innovative and successful app science teacher development in Arizona. At a time when m state's physical science teachers are teaching out of field, th programs improve learning and achievement of K-12 studen science and mathematics by providing model-centered profe development for teachers in grades 8 through 12.

ACCOMPLISHED

compare   Full De

ASSET STEM Education: Elementary Program

ASSET (Achieving Student Success through Excellence in Teaching STEM Education is a national STEM improvement nonprofit that inspires innovation and excellence in STEM by providing highly effective educator professional development, hands-on classroom materials and consulting services to schools, universities and organizations.

ACCOMPLISHED

compare   Full Details →

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Principles for quality

- Created by **CSR leaders**

- Based in **research**

- **Refined** by WestEd

Principles for quality

OVERARCHING

- Well-defined **Need**

- Rigorous **Evaluation**

- **Sustainability**

- **Replication/ Scalability**

- High-impact **Partnerships**

- **Capacity** to meet goals

STEM-SPECIFIC

- Challenging, relevant **Content**

- STEM **Practices**

- **Inspiration** of STEM interest, engagement

- **Underrepresented Groups**

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4

Example: STEM Practices

H. STEM Practices: Does the program incorporate and encourage STEM practices?

ACCOMPLISHED	DEVELOPING	UNDEVELOPED
Program creates an environment where staff or volunteers foster students becoming active participants in their learning.	At times, the program allows participants and staff/volunteers to work together as active learners, but, as a rule, the instructor drives the learning.	Staff or volunteers lead instruction with little opportunity for participants to become active learners.
Program promotes STEM practices by encouraging participants to: ask questions and/or define problems; develop and use models; plan and carry out investigations; analyze and interpret data; use mathematics and computational thinking; construct explanations and/or design solutions; engage in argument from evidence; obtain, evaluate, and communicate information; and attend to precision.	Activities are hands-on but do not consistently encourage STEM practices. Some hands-on activities are routine and focus on the 'right answers'.	The program does little or nothing to incorporate or encourage STEM practices.
Program explicitly demonstrates how it builds skills like critical thinking, problem-solving, creativity, collaboration, and teamwork.	Program explicitly aims to promote skills like critical thinking, problem-solving, creativity, collaboration, and teamwork, but it does not clearly specify how.	Program makes no clear attempt to engage participants in skills like critical thinking, problem-solving, creativity, collaboration, and teamwork.
Program prompts participants to be innovative, by having them create new ideas or products in an unscripted fashion.	Innovation is discussed, but not used to create new ideas or products.	Program does not address innovation. Participants are not expected to create new ideas or products in an unscripted fashion.

Sample evidence:
· Curriculum materials, lesson plans, schedule of program activities, deidentified student work, and assessments specifically addressing active and problem-based learning activities (i.e. open-ended research, asking relevant questions, designing problems; carrying out investigations, etc.)
· Student outcome data
· Internal and/or external evaluation reports

Notes:

Realizes the vision

Good intentions, but…

Doesn't even address the issue

5

Example: **STEM Practices**

H. STEM Practices: Does the program incorporate and encourage STEM practices?

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- Student outcome data
- Internal and/or external evaluation reports

Notes:

Rigorous Application Process

7

Rigorous Review Process

A. NEED
Does the program address a compelling and well-defined need?

Self-rating: **Accomplished**

Reviewer 1: Undeveloped
Reviewer 2: Undeveloped

Final score:

Hide Additional Details »

Program's explanation for this rating:

Our statement of need is clear. Everyone needs a hug once in a while, especially before one of those hard math tests! People have told us so. That's why we make sure that every test taker gets to hug a soft teddy bear before taking each test. Research shows that hugs administered by teddy bears are the best hugs of all.

Documents that support the program's rating for this principle:

TeddybearResearch.pdf — Teddy bear research supplied in recent funder report.

Accomplished	Developing	Undeveloped	N/A
Statement of need is clear, compelling, and supported by recent, valid and targeted data.	Statement of need is clear and compelling but cites only general data.	Reviewer Reviewer — Description of need is vague or unconvincing and cites little or no data.	
Program makes clear that it adds unique value in addressing the need.	Program identifies other past or present programs that address the same need, but does not fully demonstrate how it adds to those programs.	Reviewer Reviewer — Program makes no attempt to identify or evaluate other past or present programs that address the same need.	
Target audiences are well defined and closely tied to statement of need.	Program defines target audiences but does not clearly tie them to statement of need.	Reviewer Reviewer — Program does not make clear what audiences it is targeting.	
Program can demonstrate that it is reaching the audience in greatest need of its services.	Reviewer — Program makes clear efforts to reach audiences in greatest need but cannot demonstrate what proportion of those audiences it is reaching.	Reviewer — Program makes little effort to reach intended audience.	

Reviewer notes:

For the purposes of this self-eval and the database, it would be helpful for the program to explicitly state what they see as the need for this program, and actually connect the dots. By reading their materials, one can surmise the need and value of the program, but none of the rubric elements are addressed directly by their explanation for this rating. If the 'need' was informed by previous studies, the program should submit that work as evidence. Since this is xx xx program, there is no evidence that they are reaching the audience in greatest need. Rather, they have completed a study (over 10 years ago) and have made their materials available on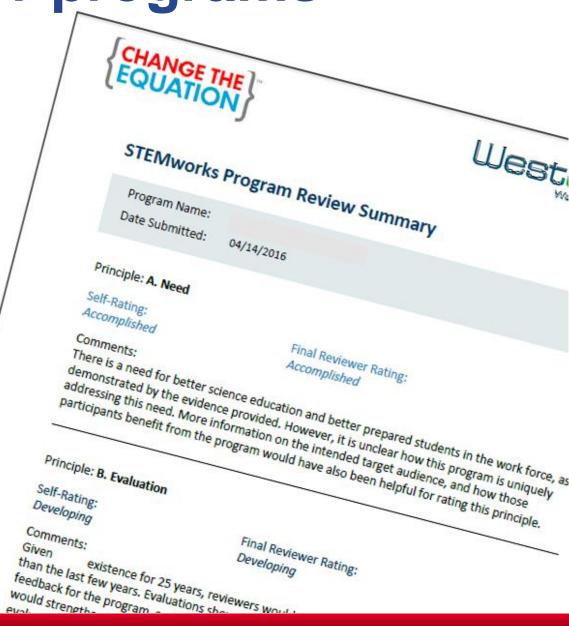 the web. No data is cited for how it has been used and by who over time. In one of the appendix articles it states, "Four score and seven years ago, our fathers brought forth on this continent a new nation, conceived in liberty, and dedicated to the

At least two reviewers per program

Reviewers leave specific feedback for applicants

Reviewers often disagree with the applicants.

8

Feedback for programs

- Every program gets **feedback**

- Some programs **reapply**

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STEMworks Program Review Summary

Program Name:
Date Submitted: 04/14/2016

Principle: **A. Need**

Self-Rating:
Accomplished

Final Reviewer Rating:
Accomplished

Comments:
There is a need for better science education and better prepared students in the work force, as demonstrated by the evidence provided. However, it is unclear how this program is uniquely addressing this need. More information on the intended target audience, and how those participants benefit from the program would have also been helpful for rating this principle.

Principle: **B. Evaluation**

Self-Rating:
Developing

Final Reviewer Rating:
Developing

Comments:
Given existence for 25 years, reviewers would than the last few years. Evaluations sho feedback for the program would strengthe

Very selective process

- Rougly **30%** of applicants have been admitted

- Some are admitted as **"promising"**; some as **"accomplished"**

- All have to **"re-certify"** after 3-4 years.

What it takes: "accomplished"

- Highest rating in at least **seven** principles

- Lowest rating in **none**

- Highest rating in **"Need"**

- Highest rating in at least one of the following: **"STEM Content," "STEM Practices,"** and/or **"Inspiration"**

What it takes: "promising"

- Lowest rating in **no more than 4 principles**

- Highest rating in **"Need"**

- Highest rating in at least one of the following: **"STEM Content," "STEM Practices,"** and/or **"Inspiration"**

How state leaders partner with us

- Simply **select programs from the existing** STEMworks list

- Use STEMworks to **identify additional programs** for scaling in the state

What states provide

- Reviewers who dedicate **review time** (Ca . 2-3 hours/program)

- **Administrator** to coordinate reviewers

- **Outreach** to STEM program providers in the state

- Pledge **not to alter** the STEMworks principles; states **can add** principles

What CTEq provides

- Online **application and review portal**

- **Training** of state reviewers

- **Technical assistance and support** to state partner and program applicants

- **Quality control** to ensure consistent high standards

STEMworks review timeline

Four-month process:

- **Prepare** the review website: 2 weeks

- **Application window**: 6 weeks

- **Review period**: 6 weeks

- **Prepare to announce results**: 2 weeks

Thank you

Claus von Zastrow

COO/Director of Research

Change the Equation

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