

DEVELOPING EFFECTIVE AND ENGAGING PRACTICE IN STEM VIA UNIVERSITY–COMMUNITY COLLABORATIONS



*Presented by California State University Long Beach,
Department of Science Education*

*Project supported by the California State University Chancellor's Office
with generous funding from the W.M. Keck Foundation*

For more information, go to www.csulb.edu/scied/deep

BACKGROUND

Emerged from several local efforts and nationwide initiatives

- *STEM is Everywhere!* National convocation bringing together educators, researchers, community organizations, funding agencies, etc. (2014)
- *CSULB efforts* to work with community partners to foster technology and science teaching
- Support and funding from the **CSU Chancellor's Office** and the **W.M. Keck Foundation**

(2015)





GOALS

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- To support STEM teaching and learning using resources from across community sectors.
- To provide future teachers with a variety of unique STEM teaching opportunities that enhance their growth as educators
- To support STEM learning opportunities for children and families throughout the community
- To identify elements of effective practice to build models for collaboration

Three components...

➤ Teaching Practicum

Provides credential students (elementary and secondary) with authentic teaching experiences *prior* to student teaching

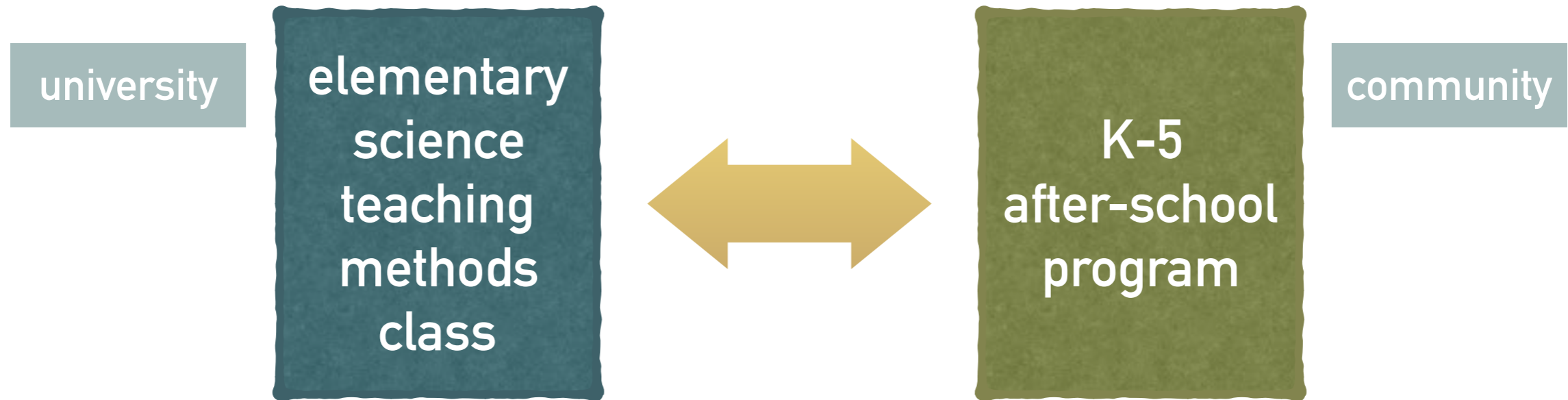
➤ Internship

Provides recently credentialed students opportunity to continue honing their teaching practice, with a focus on learner engagement, prior to entering their own classroom

➤ Early Field Experiences

Provides STEM majors with experiences that introduce them to teaching as a possible STEM career

STEM TEACHING PRACTICUM EXPERIENCE (TPEX)



- Jo Topps, Regional Director, K-12 Alliance and University Instructor, CSU Long Beach
- Tamara Araya, University Instructor, CSU Long Beach
- Lisel Flores, Site Director, Boys & Girls Clubs of Long Beach
- Claudia Torres, Director of Operations, Boys & Girls Clubs of Long Beach

elementary
science
teaching
methods class

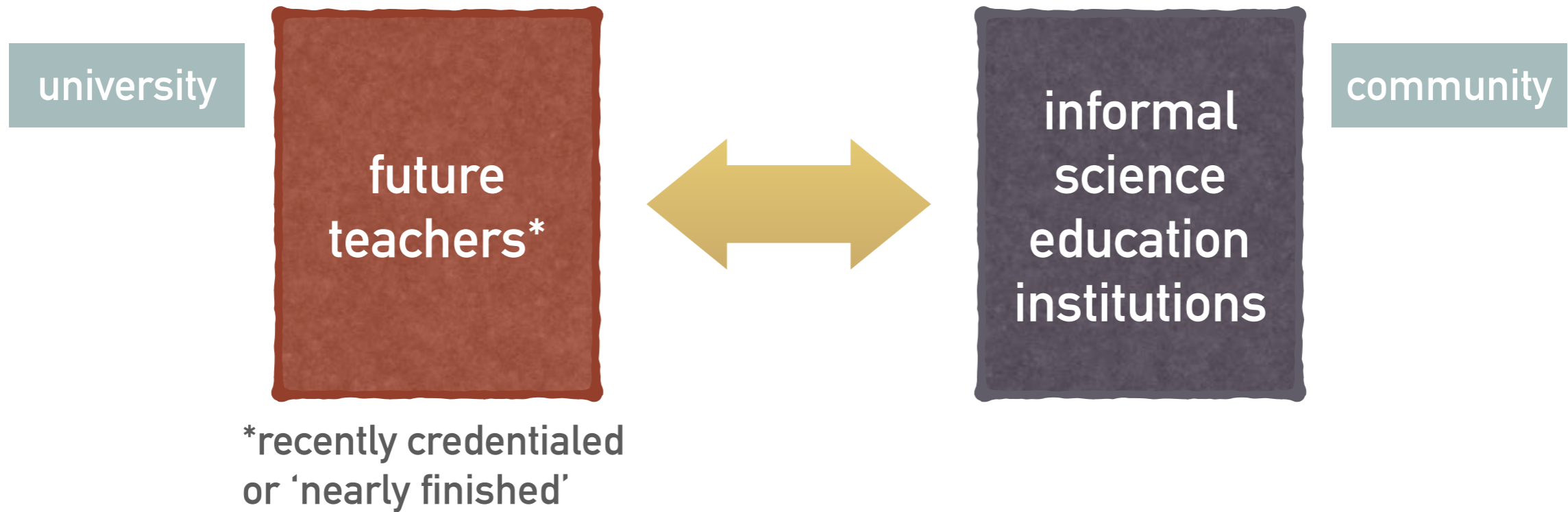


K-5
after-school
program

EVALUATION: IMPACTS ON PARTICIPANTS (TPEX)

- Elementary pre-service teachers in the TPEX group were less likely to agree that ‘Teaching science makes me anxious’ and more likely to agree that ‘Students really enjoy engaging in science activities’ when compared to their classmates in a control group.
- Over 30% of these (elementary credential) students indicated that the program allowed them to develop their practice as teachers. They rated their experience at the Boys and Girls club as the most helpful aspect of the science teaching methods class.
- Over 85% of secondary pre-service teachers indicated that the experience helped build a foundation for teaching and gave them new ideas for teaching

STEM INTERNSHIPS



- **Evelyn Serrano**, ScienceLive Program Coordinator, California Science Center
- **Rick O'Connor**, Program Coordinator, Columbia Memorial Space Center
- **Jim Kisiel**, Professor, Science Education, College of Natural Sciences and Mathematics, CSULB

future
teachers*



informal
science
education
institutions

*recently credentialed
or 'nearly finished'

EVALUATION: IMPACTS ON PARTICIPANTS (INTERNSHIP)

- Interns showed significant changes regarding their agreement with several statements, including ‘Teaching science makes me anxious’ (decrease) and ‘I am confident including science lessons as part of my curriculum’ (increase), when compared to their perspectives *at the start of the internship*.
- Data suggest a shift toward a stronger *science identity* and *increased confidence in teaching science*.

“While I was hesitant to teach science before, working at the Science Center has given me newfound confidence and curiosity. It really seemed to put science in my reach, which is what I want to do for my students. When it seems attainable, it becomes fun.”

-Keck STEM Intern, Summer 2015

WHAT ELEMENTS ARE NECESSARY FOR AN EFFECTIVE COLLABORATION?

KEY ELEMENTS NEEDED FOR DEVELOPING THE COLLABORATIONS

- **Pre-existing organizational structures that can support programming**
- **Institutional capacity for new programming**
- **Willing university instructors**
- **University liaison to facilitate communication among collaborators**
- **Logistics support**
- **Early perceptions of project benefits**
- **Pre-existing relationship between university and community institutions**

QUESTIONS?

PANELISTS AND PARTICIPANTS

- **Tamara Araya** (tamara.araya@csulb.edu). LBUUSD teacher, University Instructor, CSU Long Beach
- **Jim Kisiel** (j.kisiel@csulb.edu) Principle investigator, Professor, Department of Science Education, CSU Long Beach
- **Rick O'Connor** (OConnor@downey.spacecenter.org) Program Coordinator, Columbia Memorial Space Center
- **Evelyn Serrano** (eserrano@cscmail.org) ScienceLive Program Coordinator, California Science Center
- **Jo Topps** (jtopps@wested.org) Regional Director, K-12 Alliance and University Instructor, CSU Long Beach
- **Claudia Torres** (ClaudiaT@bgclublb.org) Director of Operations, Boys & Girls Clubs of Long Beach
- **Lisel Flores** (liself@bgclublb.org) Director, Boys & Girls Clubs of Long Beach
- **Stephen Adams** (stephen.Adams@csulb.edu) Professor, Department Of Educational Technology And Media Leadership, CSU Long Beach
- **Lisa Martin-Hansen** (L.MartinHansen@csulb.edu) Professor & Chairperson, Department of Science Education, CSU Long Beach

THANKS

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SPECIAL THANKS to the **W.M. Keck Foundation**
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