



Enhancing Professional Learning Capacity Cohort





***How can diversity among
ISL staff and educators
be increased?***

What kinds of equity training are needed?



Exploring ISE Professional Learning Frameworks

Figure A. Features Affording and Shaping Science Learning and Commitment

	Formal Settings	Informal Science Education Settings	
	K-12	Informal Education Organizations	Science-Rich Cultural Institutions
Structural Features	Abstract/textual Scoped and sequenced curriculum Mandated entry points and modalities Regular and required participation Dedicated children's spaces Professional structures and supports Formal assessments	Concrete/object-based and textual Sequenced curriculum Optional entry points and modalities Less regular and more volitional participation Borrowed learning spaces Little professional structure and support Few formal assessments; links to school scores	Concrete/object-based, little text Linked curriculum Multiple entry points and modalities Sporadic and volitional participation Public learning spaces Little professional structure and support No formal assessments
Social Features	Extended (year-long) relationships Individual learning Teacher-directed activities Teacher-paced activities High-stakes (evaluative)	Sustained relationships Collaborative learning Group-directed activities Group-paced activities Low-stakes (non-evaluative)	Short-term, sporadic relationships Collaborative learning Learner-directed activities Learner-paced activities Low-stakes (non-evaluative)
Physical Features	Classrooms in school buildings	Variety of spaces in the community	Variety of cultural institutions and natural settings

Bevan, B., Dillon, J., Hein, G., McDonald, M., Michalchik, V., Root, D., Miller, D., Rudder-Kilkenny, L., Xanthoudaki, M., & Yoon, S. (2010). Making Science Matter: Collaborations Between Informal Science Education Organizations and Schools.

Table 1: Emergent pathways

	Early Career	Mid-career	Mature career
Visitor experiences	Implement	Develop experiences	Cultivating audiences
Relationship building	Front-line/in house	Build partners to do our work better	Partnerships for development of museum
Human resources	Manage staff	Develop personnel	Manage human resources
Mission	Represent	Advance	Develop
Budget	Manage	Develop	Overall institutional budget
Operations	Abide by policies	Operational problem solving/ operational issues	Sustainability
Professional learning	Individual PL	Team level PL	Institutional PL
Direction	Forward facing/implement	Delegate	More removed
Role	See	Hear	Think
Quality performance	Evaluation object	Evaluator	Standard setting
Focus	Job	Greater knowledge, more proactive; more external	Individual as a whole
Reflect	Individual 1-1	Staff development; group	Whole and community
Focus	Audience focus	Internal focus	Ideas—how it all works

Heimlich, J. E., Morrissey, K., Glass, M. A., Storksdieck, M., Schatz, D., & Hunter, N. (2021). Building an Informal STEM Learning Professional Competency Framework. *New Horizons in Adult Education and Human Resource Development*, 33(1), 25–36.



Informal STEM Learning Professional Competency Framework for Institutional Use



Professional Competencies for the Informal STEM Learning Field

ASTC
Association of
Science and
Technology
Centers



CENTER FOR
RESEARCH &
EVALUATION



Oregon State University
STEM Research Center

Who is this for?

- **Diversity of institution types:** Science and technology centers and museums, natural history museums, children's museums, zoos, aquariums, nature centers, botanical gardens, planetariums, and other types of museums and cultural organizations
- **Diversity of job roles:** Education, exhibits, floor & operations, member services, communications, development, facilities, etc.
- **Audiences we're designing for:**
 - Individuals
 - Institutions
 - Professional networks & associations
 - Higher education programs

Informal STEM Learning Professional Competency Framework



BEFORE

First grant: 2015-2019



AFTER

Current grant: 2022-2025

Job-Specific Expertise



Engagement in the Profession

1. Engage with professional organizations, networks, publications, and other resources.
2. Use and contribute to the knowledge -base of the field.
3. Represent and promote the work of ISL institutions and the ISL profession.
4. Strengthen workforce capacity, retention, and satisfaction.

Professional Learning & Knowledge

1. Understand basic STEM content and processes.
2. Understand and apply principles of informal learning.
3. Understand trends and practices that inform ISL work.
4. Demonstrate a commitment to professional learning.

Strategic Practices

1. Demonstrate project management skills and strategies.
2. Identify and understand the purpose, goals, or objectives of programs, projects, and activities.
3. Align planning, implementation, and assessment of projects, products, and services with goals.
4. Cultivate reflective and evidence-based practices.
5. Adjust actions and priorities to achieve desired goals, outcomes, or objectives.

Using Technology

1. Maintain proficiency in relevant technologies.
2. Select and use technologies for communication and collaboration.
3. Consider reliability, ethics, cost/benefits, and purpose when selecting technology-based tools or platforms.

What's next for the ISL Framework?



1. Field review of revised Framework and competencies
2. Co-creation of companion tools, e.g. self-assessment, learning plan, professional learning resources, career pathway stories
3. Evaluation of tools conducted by COSI Center for Research & Evaluation
4. National survey #2 conducted by Oregon State University STEM Research Center
5. Rollout of new Framework, website, and tools in summer 2025

Other frameworks and resources gathered

[Links to Other Frameworks/Resources](#)



Scan me!

Questions Raised



- **Whose professional capacity are we enhancing and for what purpose?**
- How can we better refine our focus?
- How do we prioritize diversity, equity, and inclusion?
- What skills and practices are crucial for identity and well-being in STEAM?
- **What support do we need, and what can we learn from polling other participants?**

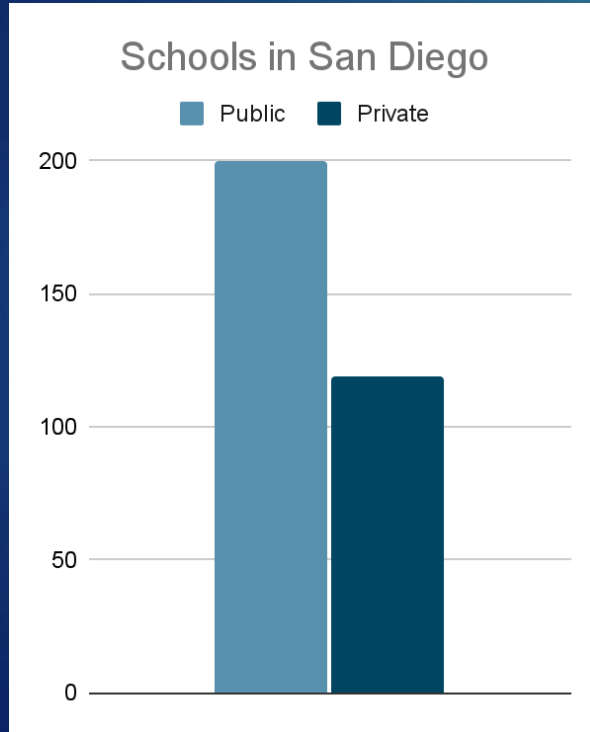
KEY THEMES AND ISSUES



- Professional capacity depends on individual, institutional, and social contexts/needs.

High Level Of Diversity Of STEAM Settings

K-12 After School



Informal Education Organizations



Science-Rich Cultural Institutions



High Level of Diversity of Roles



KEY THEMES AND ISSUES



- Need to consider how informal educators perceive and define themselves in relation to these frameworks
- **What and who are we missing?**

Need for Needs Assessment! Survey Development



Individuals

- What experiences formed you as an educator?
(e.g., real world experiences, degree, etc.)
- Demographic Information
- Perceptions of career pathways (Why would you stay? Why would you leave?)
- Perceptions of their work in relation to larger ISE field

Institutions & Organizations

- Identifying sectors across ISL community
- Interpretation of institutional roles and goals
- How they define their mission in relation to equity and inclusion?
- How do staff see their institutions in the broader STEAM ecosystem?

STEAM and Society

- What are we working toward in these STEAM learning places?
- Who is defining what counts as STEAM?
- How do these ideas inform and intersect with the needs of informal science educators?

Cross Cohorts Quick Survey

- In your ISL work, which workers leading STEAM activities should identify as informal STEAM educators but currently do not?
- What type of training would enhance their sense of identity, confidence, and belonging in informal STEAM education?
- Who in your organization engages youth in STEAM programming, and what backgrounds or resources do they draw on? Who receives training, and who does not?
- Is there STEAM learning happening that is not currently labeled as STEAM ?

Don't Identify as STEAM Educators	Types of Training Needed	Who Does STEAM PL/PD? Who Gets It?
Underrecognized Informal STEAM Educators Younger/New Professionals -Teachers/Instructors who don't self-identify -Discipline specific educators -Part-time workers -Ed program and outreach staff -Agricultural & outdoor education staff	Building Connections & Networking -With other orgs & informal educators -Conferences & presentations -Case studies from experienced eds -Virtual modules from different ed settings -Recognition & awards	Who Does STEAM Professional Learning? -Staff in 20's with art, making, & ed degrees -Senior staff for curriculum-mostly white & masters degrees -Learning teams with diverse backgrounds -Multiple departments- exhibits, collections, education, customer service -Adult volunteers mentoring younger ones -Ed designers from R & D -University NSF project teams
Non-traditional Educators -Parents -Scout leaders -Boys & Girls Clubs -Museum volunteers/docents -Customer service staff -Free program coordinators -Overnight program staff -Birthday party staff -Child care workers	Integrative STEAM Approach -How to integrate multiple disciplines in STEAM -Move beyond content silos Other Strategies -Inquiry -based facilitation methods - Role modeling -Trying activities as learners -Connecting STEAM back to mission	Resources Draw on for Training -Cultural resources but often overridden by senior staff preferences -Prior ed & field experience of staff -Resources from NAAEE & AZA -Community partnerships -Surveys and focus groups -Conferences & inter-org conversations -STEAM boxes from amazon (quality varies)
Auxiliary Personnel -Cafeteria & maintenance workers -School nurses	Alignment with Intended Learning Outcomes -How informal work aligns with intended learning in science & arts -How own STEAM experiences are relevant	Who receives training? -Senior staff who onboard younger staff -Learning dept -Teen volunteers from adult volunteers -Researchers - informally on STEAM project staff

Whose professional learning capacity are we developing and why?



- Who do we start with in the field?
- What are trajectories for advancement and for whom?
- Frameworks align for building individuals' capacities to do STEAM, but what about capacity building of organizations for increasing equity and inclusion in ISE and STEAM?

Key Themes and Issues



- Professional capacity depends on individual, institutional, and social contexts/needs.
- High level of diversity of roles (e.g., Educational Leaders, Educators, Temporary staff/Interns/Gig/student, Support Staff)
- Competencies differ based on experience and career level (Early career, mid-career, mature career)
- High level of diversity of STEAM settings (K-12 after school, informal education organizations, science-rich cultural institutions),
- Need to consider how informal educators perceive and define themselves in relation to these frameworks? What and who are we missing?

Where does STEAM fit into the equation?

