Collaborative Research: An Evidence-based Informal STEM Learning (ISL) Professional Framework

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Framework Timeline

Phase One
- DACUM workshops and verifications
- Research synthesis of existing frameworks in similar fields

Phase One Outcome – Alpha Version

Phase Two
- Vetting
- Interviews with:
  - professionals in the field
  - framework experts
- Field exposure

Phase Two Outcome – Beta Version

Phase Three
- Vetting and reuse
- Survey:
  - broad audiences
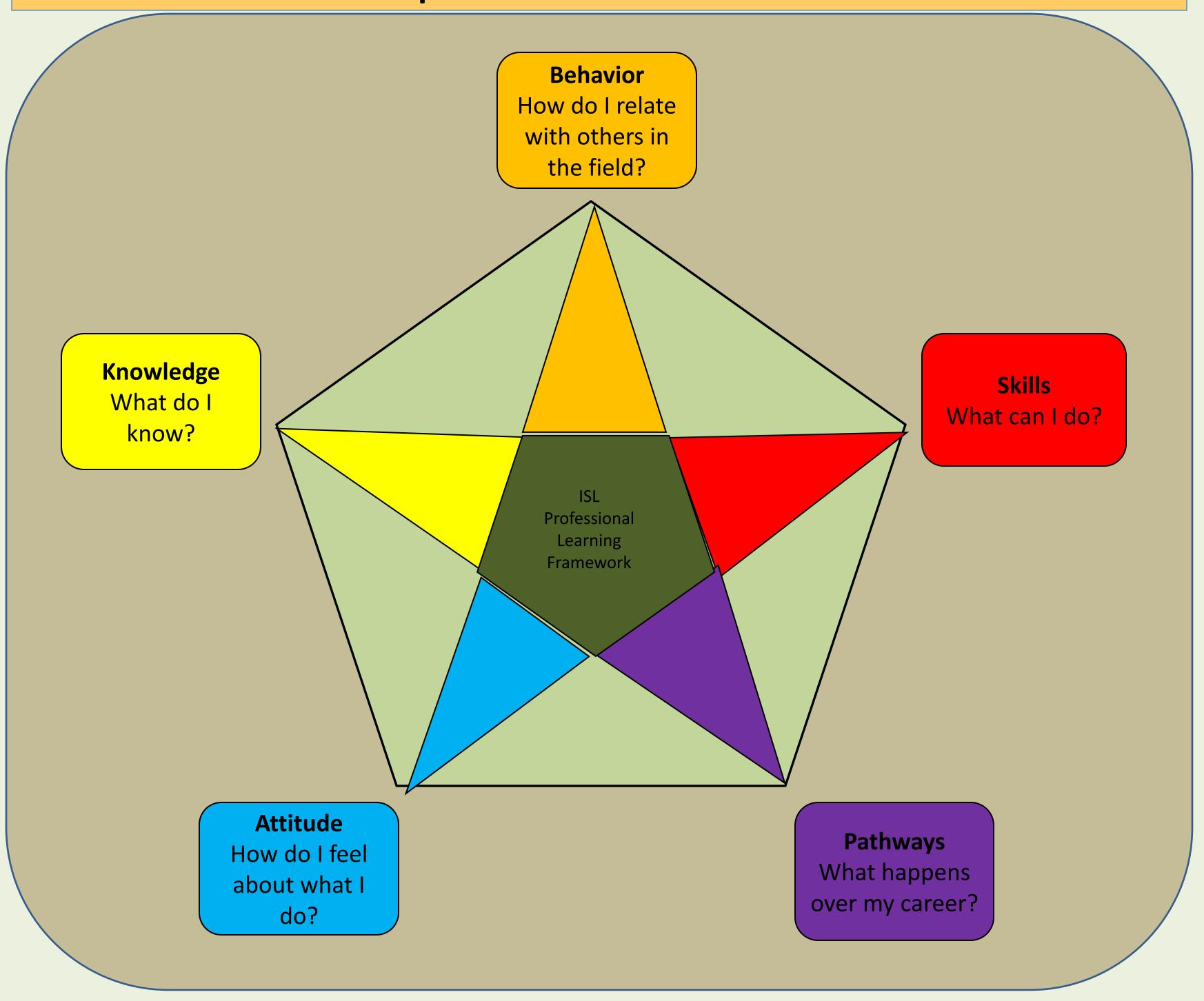 - specific focus groups

Phase Three Outcome – Trial Version

Overview

This project centers on the creation and validation of a theoretically grounded and empirically derived Framework for professional growth and learning within the informal STEM learning (ISL) field. The Framework will be useful to ISL practitioners at any stage of their education or career by laying out the necessary skills, knowledge, and dispositions to guide their professional growth. While the immediate beneficiaries of the project will be ISL professionals themselves, the ultimate beneficiaries of the work will be the children, youth, teachers, and general public that engage with STEM experiences designed and implemented by a skilled and knowledgeable ISL professional workforce.

The Framework will be built from qualitative and quantitative empirical analyses of actual practices used by staff of science centers and museums. It will be a practical tool that helps science center and museum staff to identify what it is to become a professional in the informal science education field.

Five key components will guide the ISL practitioner through the professional framework

- **Behavior** How do I relate with others in the field?
- **Knowledge** What do I know?
- **Skills** What can I do?
- **Attitude** How do I feel about what I do?
- **Pathways** What happens over my career?
- ISL Professional Learning Framework

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What is DACUM?

- Acronym: Developing A CurriculUM
- A process for:
  - Job analysis
  - Occupational analysis
  - Process analysis
  - Functional analysis
- Used by vo-tech educators; business-industry trainers; government-military agencies
- Used because it is effective, quick, and low cost

DACUM Philosophy

- Expert workers can describe and define their job more accurately than anyone else
- An effective way to define a job is to precisely describe the tasks that expert workers perform
- All tasks, in order to be performed correctly, demand certain knowledge, skills, tools, and worker behaviors

Key Terms

- Duties - A cluster of related tasks
  - Usually 6-12 per job
- Tasks - Specific meaningful units of work
  - Usually 6-20 per duty
  - 75-125 per job
- Steps - Specific elements or activities required to perform a task

A DACUM workshop held at COSI, Columbus, OH. Above is a task list that emerged from the workshop.