

Developing the Key Components Model for Informal Physics Programs



Dena Izadi (she/her)
AAPT Summer 2022



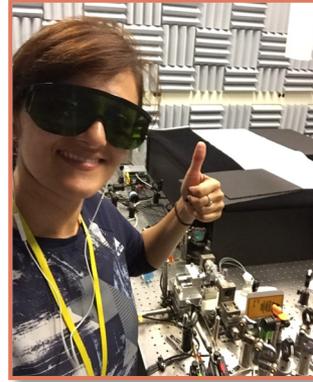
Project Team



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all illustrations
from
<https://storyset.com/>



Many aspects of Informal Physics

Activities that physics community do outside classroom for its audience to learn physics!



- Afterschool programs

- Demos, Hands-on

- Various physics contents

- Tours

- Public events

- Books

- ...

- Individual physicists

- Physics students and student groups

- Broader physics institutions

- ...

- K-12

- High School students

- General public

- Underrepresented groups

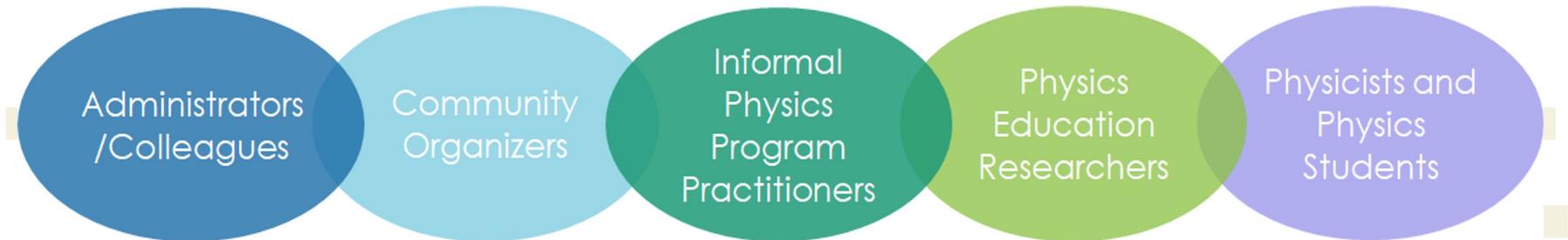
- Undergraduate students

- ...

Strategy for Mapping Landscape



1. Find programs
2. Collect and analyze data to gain information across multiple scales
3. Accessible and useful reporting to different groups

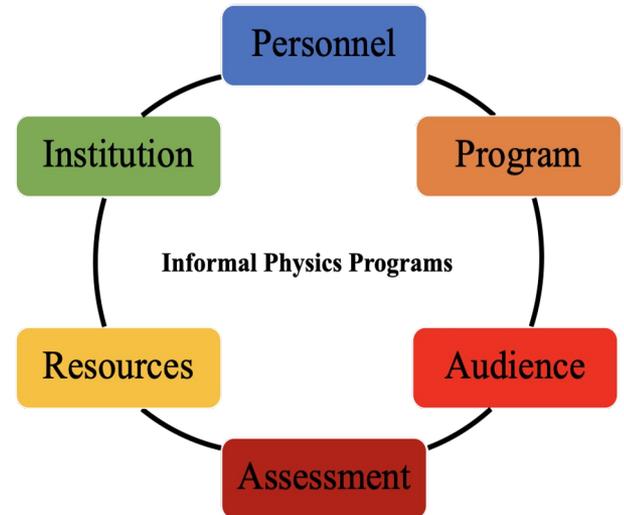


Organizational Theory for Informal Physics Programs

OT describes the relationship between the individuals working together, their environment, and their **overall effect on the performance of the organization**

- Interdependent
- Socially Constructed
- Different goals
- Different ways of working
- Different formal and informal training

We have contextualized a coarse-grained framework based on Organizational Theory & Nonprofit Organizational Frameworks



Motivation

Why do we care about creating a model?

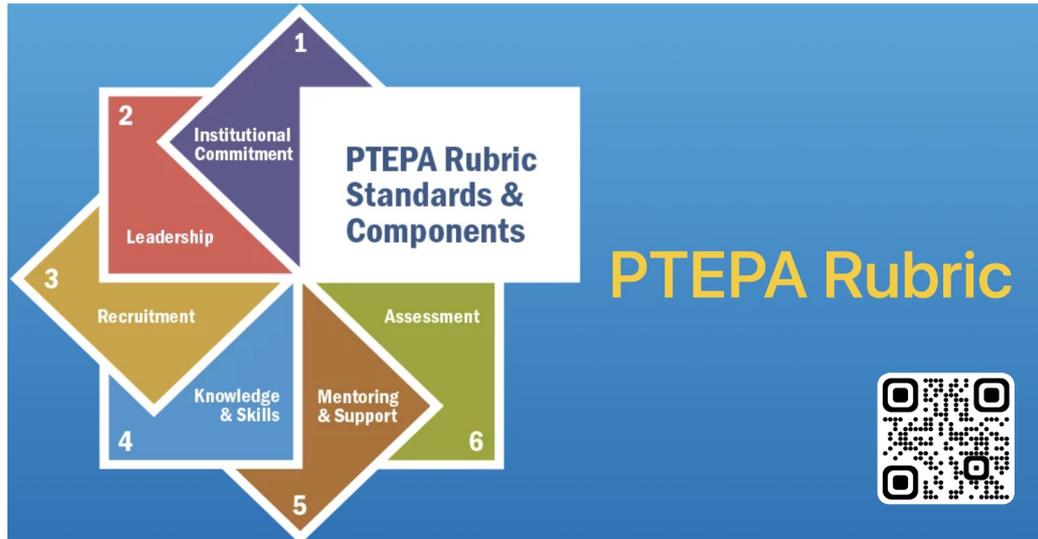
Key Components:

- Generalizable across different types of programs
- Created under the influence of practitioners
- Can gauge program functionality (for self reflection and feedback)



Models for model-making

Aiming to develop a tool for facilitators for self-assessment and improvement

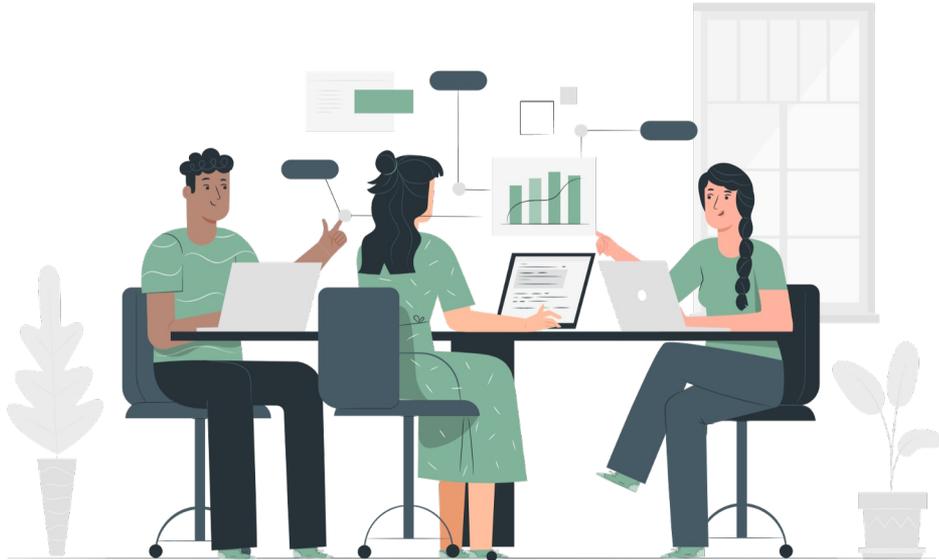


The Physics Teacher Education Program Analysis (PTEPA) Rubric:

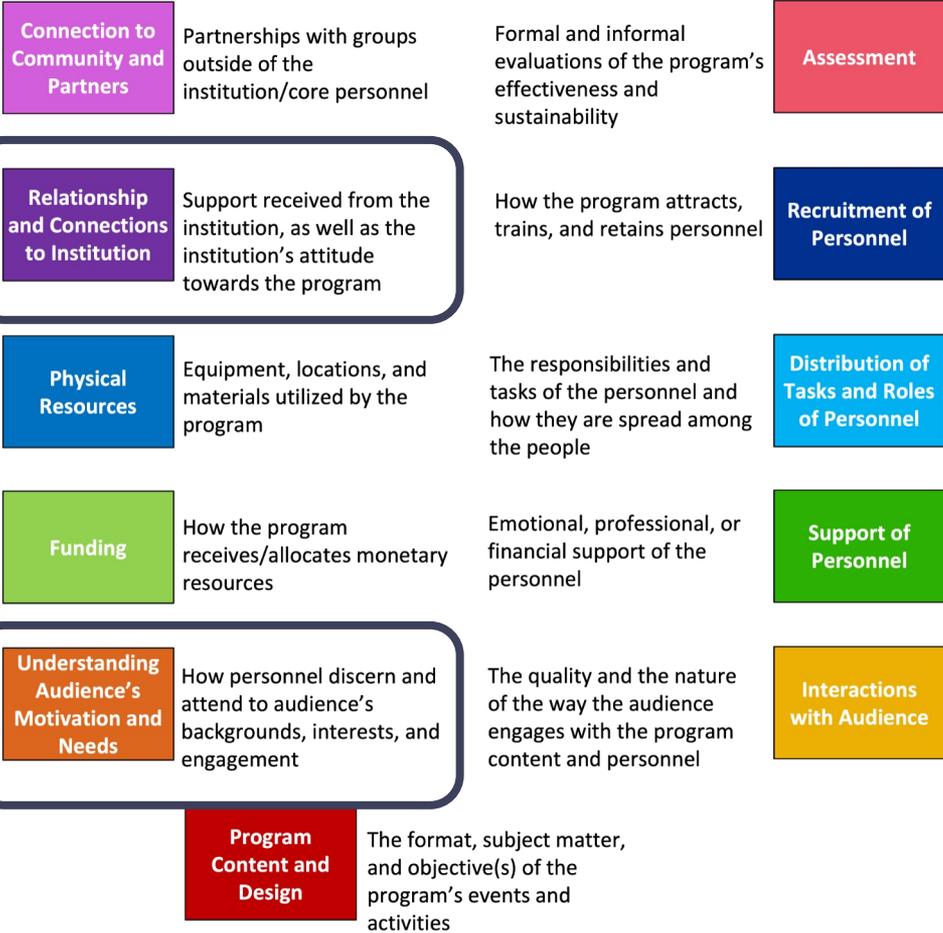
- **feedback**
- guide them in **self-reflection** toward **improvement**,
- provide tools to characterize program **growth**

Qualitative Analysis

- Iterative coding of interviews to identify fine-grained emergent subcodes from the contextualized framework
- In-depth analysis of interviews from 15 programs (iterative process)



Our Key Components Framework



PERC Poster Session II
Thursday, July 14, 9:30am



Lily Boyd
(Undergraduate Researcher)

Support received from the institution, as well as the institution's attitude towards the program

Relationship & Connections to Institution

*"I never really got much in the way of actual **support from the department** either **advertisement** or **financially supported**.... so I got a pat on the back in some sense at one point, but other than that, yeah."* – Public lecture program leader

Understanding Audience's Motivation & Needs

*“Well, for the elementary school students, it introduces them to science in general. And they always **seem pretty excited about it**. And we get feedback from teachers that, afterward, some of them say **that they want into science**. So I think it **does help spark some interest in science itself**.”* – University Staff, Co-leader of the program

How personnel discern and attend to audience's backgrounds, interests, and engagement

Summary

- Developed **Key Components Model**
 - identifying common factors that affect program **functionality**
 - framework to **characterize and assess** informal physics programs

Outlook

- **Continue the validation process:** external researcher additional interviews with key components framework
- Develop a **user-friendly tool for facilitators** to assess and improve their informal physics programs