RT-149: The Technology Leadership Development Framework

PI: Dr. Wilson N. Felder
Research Team: Dr. Katherine Duliba, Dr. Steve Yang,
Dr. Michael Pennotti, Cheuk Y. Mo

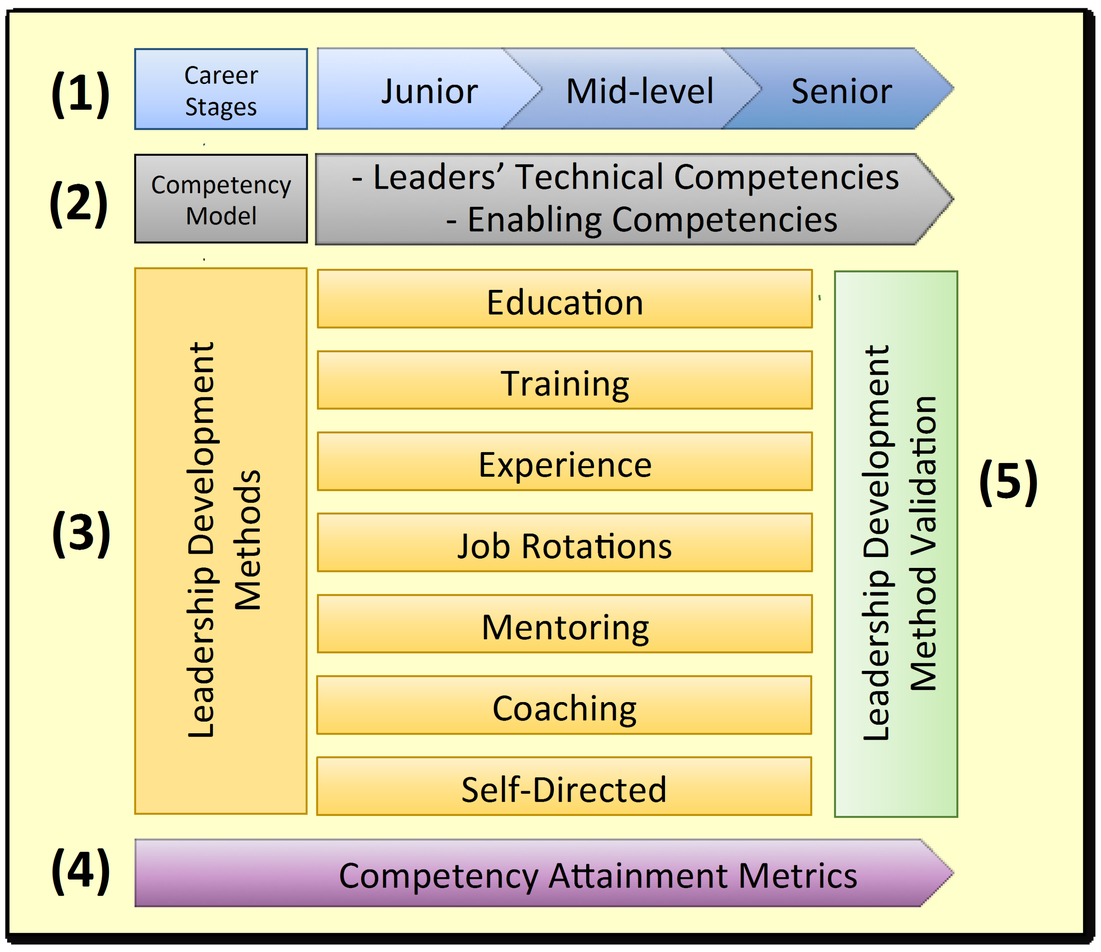
Research Task / Overview

- Technical leadership development is important in advancing the careers of systems engineers, building bench strength of the technical workforce in the government and commercial sectors, and ensuring that the U.S. continues to lead in technical advancement globally.
- This task creates a framework to enable organizations and systems engineers to progressively develop their technical leadership talent/competencies from entry through to senior-level positions. To do this, we build on our colleagues' work:
  - Helix (Pyster, *et al*., 2013-16),
  - Technical Leadership Development Program (Gavito, *et al*., 2010-11),
  - Army Systems Engineering Development Model (Gavito and Pennotti, 2014-15),
  - SE Experience Accelerator (Wade, *et al.,* 2013-16).

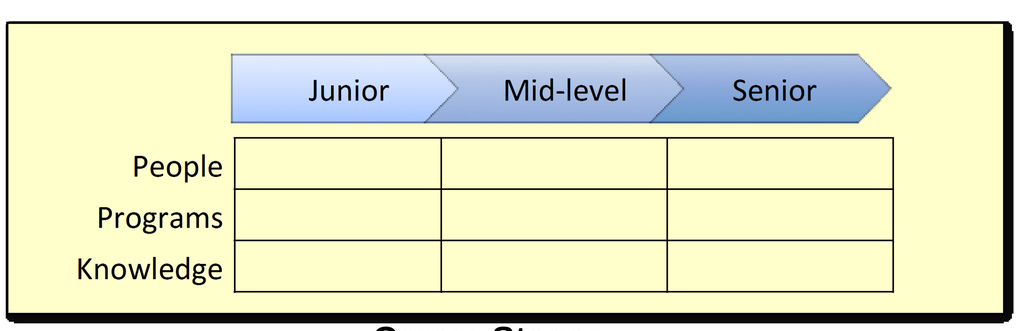
Goals & Objectives

- To build a **technical leadership development framework**, enabling a broad spectrum of the technical workforce (from engineers to IT specialists) to develop their technical leadership competencies;
- To **leverage** our **SERC colleagues' work** in this area;
- To ensure such a framework can be **applied** by a technical **person at all stages** in their career, from the junior to senior level;
- To **identify best practices** in the government and commercial sector regarding technical leadership development programs;
- To **recommend a career model** to the DoD, based on the Framework and best practices identified.

Data & Analysis & Results

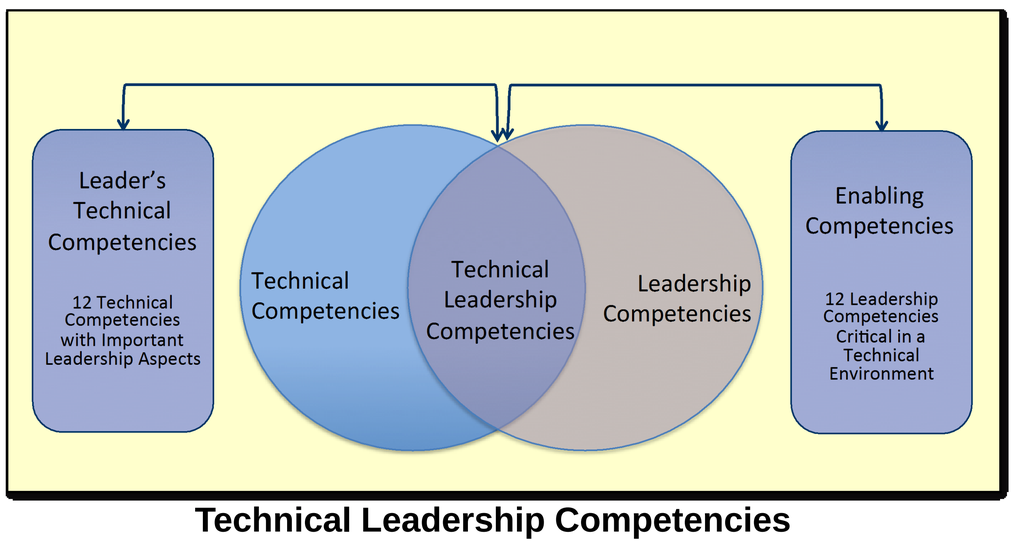


- The Framework consists of the above 5 elements.



Career Stages

- 3 key stages of technical leadership development are defined in terms of people, program, and knowledge responsibility.

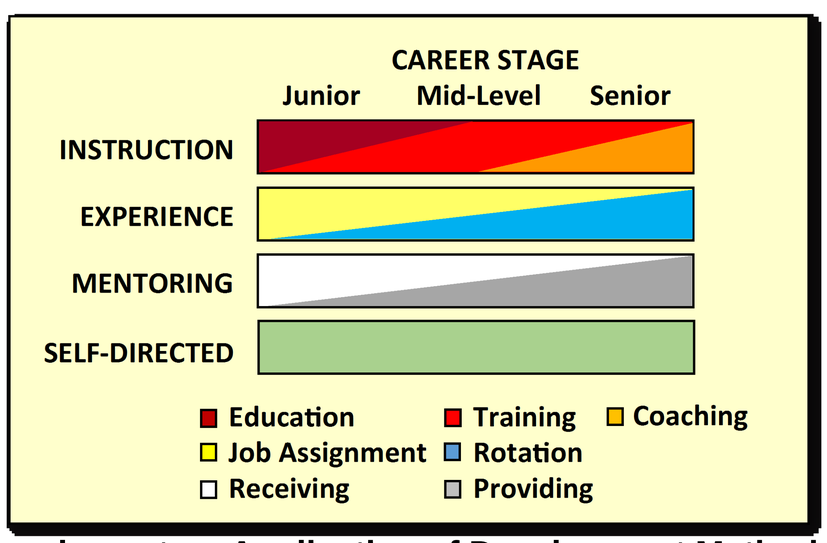


Technical Leadership Competencies

- 24 technical leadership competencies for each of the 3 progressive career stages, resulting in a 72 cell matrix. Each cell consists of key competency indicators.

Methodology

- Identified **previous research**, including systems engineering competency frameworks, technical career models, and leadership development assessment metrics;
- **Defined** the **Technical Leadership Development Framework**, including career stage definitions, technical leadership competencies, and development methods;
- **Validated** the Framework, including technical leadership competencies, with many technical leaders in the government and commercial sectors, across eight organizations;
- **Interviewed** technical leaders, in the government and commercial sectors, to **benchmark** technical leadership development programs, and gathered expert opinions on applicability of development approaches for competencies at each career stage;
- Developed **Concept of Operations** and ***Technical Leadership Development Guidebook*** to operationalize the Framework and Career Model.



Complementary Application of Development Methods

Planned Future Research

- Additional benchmarking with best-in-class institutions;
- Experimental assessment of development methods;
- Experimental analysis of competency attainment metrics;
- Longitudinal study of target and control cohorts.

Contacts/References

Wilson N. Felder, PhD - Stevens Institute of Technology
Wilson.Felder@stevens.edu

Katherine Duliba, PhD – Stevens Institute of Technology
kduliba@stevens.edu