AGLP Leadership Development Curriculum

Technical Proficiency (and Technical Leadership)

1/10/2022

	Leading-Self Competencies	Leading-Others Competencies
	Accountability & Responsibility	Effective Communications
Leadership Competencies (USCGA Leadership Development Model) *previously referred to as Personal Learning	Aligning Values	Team Building
	Followership	Influencing Others
	Health & Well Being	Mentoring
	Self-Awareness & Leading	Respect for Others & Diversity Management
	Personal Conduct*	
	Technical Proficiency	Taking Care of People

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AGLP Leadership Development Sequence

Leading-Self Competency: Technical Proficiency



January: Seminar & (self-paced) Reference Review February: "Practicum" (completed in your life-environment) March: "Post -Practicum" Session

Leading Others: February – June Leadership Principles: July - December

Technical Proficiency - Outline

- Definitions:
 - Technical Proficiency
 - Technical Leadership
 - Virtual/Remote Technical Leadership
- Case Studies in Technical Proficiency:
 - Academic
 - Government
 - Industry
 - Entrepreneurship
- Next Steps





Technical Proficiency (what is it?)



- technical knowledge & expertise to effectively and efficiently organize, prioritize tasks & use resources
- leaders demonstrate technical & functional proficiency and are aware of how their actions contribute to organizational success
- leaders maintain credibility with others on technical matters & keep current on technological advances in professional areas
- applicable to academia, government, industry & entrepreneurship

image source

& APPLIED SCIENCE

SEAS Grad Students & Technical Proficiency



but how is technical proficiency related to leadership.....

Technical Leadership (what is it?)

Technical Leadership: the leadership skills required to manage & deliver a technical output in a collaborative team

Responsibilities of a technical leader:

- communicating the team's vision and path to achieve technical excellence
- defining projects & providing technical direction
- leading by example that demonstrates technical expertise
- "standard" leadership responsibilities



Key Responsibilities of a Technical Leader

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Technical Proficiency & Leadership (why an issue?)



MirageC/Getty Images

People often get promoted into leadership roles because of technical or functional skills and expertise that enable them to perform well in their technical domain, but that don't translate into effective leadership. They then struggle to inspire, coach, co-create, and build commitment to a shared vision. Many organizations fall short in filling this gap with the training and coaching needed to develop technical or functional experts into skilled leaders. If you'd like to become as expert in leading others as you are in finding technical solutions, the best place to start is by committing to ongoing self-directed leadership development. This involves

identifying what you want to be able to do differently as a leader and why this development matters to you, broadening the perspective you're applying to your leadership challenges, seeking input, and experimenting with new behaviors. <u>Monique Valcour (HBR) Transform Your Technical Expertise into Leadership</u>

> Yale school of engineering & Applied science

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Abilities That Lead To The Mastery of Technical Leadership

Attracting talent

1

Attracting talent means actively participating in finding new team members rather than passively awaiting relying on a recruiter. A manager must continuously spend time on attracting the best possible talent.

2

Being a servant of the team

The best engineering leaders are able to not only provide vision and direction to the team but are also able to focus their energy and effort on helping the team. A great engineering leader works to identify and eliminate roadblocks that are keeping their team from performing at their very best. This is the essence of servant leadership.

3

Being humble

Great technical leaders don't assume they have all the answers. If they don't know the answer to a question, they are happy to defer to another team member or to find the answer and get back to you. To them, giving a helpful answer is more important than looking smart.

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> Kouzes & Posner: "Challenge the Process"

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Kouzes & Posner: "Enable Others to Act"

Abilities That Lead To The Mastery of Technical Leadership

4

Being trusting

Managers need to trust their team and give them space.

Micromanaging means undermining the team's skills and ability to get things done, and therefore their motivation and self-confidence. Trust between the managers and their teams should be the foundation of their relationship. And it's the manager's role and job to create it.

5

Caring about the people

The very best engineering leaders know how you take your coffee, your partner's name, and your favorite music. They care deeply about the people on their team. These are the types of engineering leaders who get the very best work out of their team.

6

Communicating the mission and vision

The best engineering leaders need to be able to communicate the mission and vision for their teams. This is as important for managers as it is for executives. A team's mission is why the team exists. A vision is how the world will look in the future if the team accomplishes its mission.

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K&P: credibility is the foundation of leadership

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Kouzes & Posner: "Encourage the Heart"

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Kouzes & Posner: "Inspire a Shared Vision"



Tuckman's Model of Team Effectiveness

Technical Leaderhsip of V/R Distributed Teams







Technical Leadership of Virtual and Remotely Distributed Teams

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Lisa Ziliox BAE Systems Inc lisa.ziliox@baesystems.com K & P: Leadership Principles Physical & Virtual/Remote applications

- Model the Way
 - P: use competencies & knowledge to lead by example / importance of communications
 - V/R: comprehend new culture, new habits / be attentive to needs & feelings

• Inspire a Shared Vision

- P: create an image of the final destination / communicate w/passion /excite the team about the journey
- V/R: very challenging / superb verbal & graphical coms skills / view the work from the eyes of the team (be empathetic)

- Challenge the Process
 - P: change the status quo if there is room for improvement
 - V/R: diversity, knowledge & sharing boosts creativity / recognize that minority opinions have less influence / simple changes may have complicated impacts (such as changing team meeting times)
 - Enable Others to Act
 - P: foster collaboration / build trust in teams / actively involve others
 - V/R: pay attention to IT trends & needs (poor tech can sink an effort) / be organized & don't waste time / team members should prioritize being engaged / leaders should seek feedback



- Encourage the Heart
 - P: keep hope & determination alive / recognize how all are contributing
 - V/R: creatively celebrate major & minor success / frequent (scaled) communications (that allows the team to really know one another, is focused & has value)



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Reporting on a Pandemic



Yuki Noguchi and Peter Salovey

December 9, 2021

Yuki Noguchi '97 BA, a correspondent on the Science Desk of NPR, and President Salovey discuss health messaging and provide advice for students during this time of uncertainty.

How to create a lasting virtual culture:

- Stay in contact w/remote employees (1on-1 & group meetings)
- 2. Communicate clearly & concisely
- 3. Use the right communication method
- 4. Lead w/empathy & foster trust
- 5. Establish clear work expectations & goals
- 6. Give your team the right resources
- 7. Encourage open dialog
- 8. Make yourself accessible

Virtual Leadership - Essential Skills for Managing Remote Teams

Compare these virtual presentations from top tech CEOs

Who was best? Who was most engaging?



Try to replicate the parts you liked in your next virtual presentation

Previously recorded

Microsoft Build

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Virtual Leadership - Essential Skills for Managing Remote Teams

SEAS Grad Students & Technical Proficiency



Easy to be proficient now, but what about after you leave Yale?

Maintaining Technical Proficiency - Post Grad-School

- Professional societies (local & international connections)
- Yale Alumni Association (affinity groups on engineering topics) & YSEA
- Community service (town, city, state, national via task forces & committees)
- Youth technical mentorship (IGEM, FIRST Robotics, Code Camps, EWB)
- Community makerspaces & hackerspaces
- Other venues?



Case Study: Technical Proficiency in Academia



Kyle Vanderlick Thomas E. Golden, Jr. Professor of Chemical & Environmental Engineering

"My advice to academics starting their career is to take as much risk as they can emotionally tolerate. At this stage in their career, they are (or should be!) bursting with ideas and with energy. At tenure time they will be judged not only by the quality of their work but also by how much they have broadened and distinguished themselves from their previous mentors. Even if their ideas don't pan out as planned, the process itself (in fact, research in general) will uncover other opportunities for discovery if not even better ones. Of course, one can always devote one's energy to projects that they know "will work" (i.e. extensions of their previous work) but chances are the significance of this work will not be that high because, by definition, it is incremental work."

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Case Study: Technical Proficiency in Government

2018

TECHNICAL LEADERSHIP DEVELOPMENT

GUIDEBOOK

THE TECHNICAL LEADERSHIP DEVELOPMENT GUIDEBOOK OUTLINES A PROCESS USED TO DEVELOP TECHNICAL LEADERS WITHIN THE UNITED STATES DEPARTMENT OF DEFENSE. THIS GUIDEBOOK EXPLAINS HOW TO ADDRESS A LEADER'S COMPETENCY DEFICIENCIES AND IMPROVE THEM IN PREPARATION FOR ADVANCEMENT AND INCREASING RESPONSIBILITY.



Technical Leadership

A technical leader must not only be highly proficient technically, but also possess the skills to competently lead a diverse team of technical employees in executing highly technical programs.



DoD Technical Competencies

Technical Planning	Technical Risk Management	
Technical Requirements Definition and Analysis	Systems Thinking Focusing on connections and interfaces among subsystems	
Logical Decomposition	Systems Complexity Understanding the interfaces within and between systems	
Product Verification and Validation	Big Picture Thinking Managing the technical aspects external to the system	
Product Transition Deploying the technical product into production, test, operations and sustainment	Abstraction Identifying and translating a pattern in one domain to a different domain	
Lifecycle View	Paradoxical Mindset Holding opposite views simultaneously to make better decisions	

DoD Enabling Competencies

Developing People	Influencing Others	
Leading People	Developing Strategy & Vision	
Thinking Critically	Fostering Agility	
Building Trust & Credibility	Promoting Innovation	
Communicating Effectively	Possessing Government Acumen	
Establishing & Maintaining Stakeholder Relationships	Possessing a Macro Perspective Delivering solutions within the political, economic, and social aspects, context or landscape	

Case Study: Technical Proficiency in Industry



Principal, Senior Principal, and Distinguished Engineers are Amazon's most senior individual technical contributors.

Amazon's Principal Engineer Community sets the standard for engineering excellence at Amazon. The community comprises Principal, Senior Principal, and Distinguished Engineers who are responsible for driving Amazon's overall technical architecture. Principal Engineers at Amazon are pragmatic visionaries. They make a lasting impact that echoes through the technology, the product, and the company. They work on Amazon's hardest problems, building high quality, architecturally sound systems that are aligned with our business needs. They remain hands-on and lead by example. By being close to the details, they earn the respect needed to be effective technical leaders. Principal Engineers bring clarity to complexity and demonstrate smart ways to simplify. They are leaders and mentors, setting excellent examples for their local teams and the entire Amazon engineering community. They meet regularly to question each other's assumptions, illuminate pitfalls, and foster shared understanding across all groups at Amazon. Amazon's Principal Engineering Community created a set of tenets to articulate and perpetuate the guiding values and expectations of Principal Engineers at Amazon! Click here to learn more about the tenets.

Case Study: Technical Proficiency in Industry



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Case Study: Technical Proficiency in Industry



Amazon's Principal Engineering Community Tenants

exemplary practitioner	technically fearless	lead with empathy
balanced & pragmatic	illuminate & clarify	flexible in approach
respect what came before	learn, educate, & advocate	have resounding impact

Case Study: Technical Proficiency in Industry Meet Amazonians working in Amazon Principal Engineering Community



Watch the videos below to learn more about what we are working on at Amazon!



Bringing container support to Lambda without adding latency



Optimization in the Grocery Distribution Center



How Amazon Fresh solves the "Too Much, Too Little" problem at scale



VLDB Women in Tech Coffee Talk



Prime Video - Disrupting Live Sports: Delivering an exclusive season of Thursday Night Football



Alexa Experiences Lightning Talk Community & Culture

Case Study: Technical Proficiency & Entrepreneurship

IsoPlexJechCrunchJechCrunchJechCrunchIsoPlex

IsoPlexis, a company uncovering a 'new layer' of cell data, aims for \$125M in market debut

Emma Betuel @emmakbetuel / 4:03 PM EDT • October 8, 2021

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Image Credits: IsoPlexis

Shares of IsoPlexis, a company creating tools to zoom in on the flurry of protein activity surrounding a single cell, began trading on Friday. The company aims to raise about \$125 million with the IPO, which will be used to build the commercial team and advance the company's plans to play a bigger part in the creation of precision medicine.

IsoPlexis was founded in 2013 and fits into the category of companies you might find in a lab during the drug research process. The company is primarily focused on single-cell proteomics (basically the study of proteins and their interactions). The company has developed instruments and software to analyze the proteins secreted by cells, from immune cells to tumor cells.

In particular, the instruments can be used to identify cells that excrete many different types of proteins. These data sets could then be used to develop new treatments or understand how people may respond to existing ones.

"Our instrument we invented is able to identity subsets of cells in the body we call superhero cells," explains CEO and co-founder Sean Mackay. "And these superhero cells are defined by a lot of activity coming from small subsets of cells you would normally miss with existing technologies today."

Mackay says there are about 150 IsoPlexis units on the market as of the first half of this year. Customers include 15 global pharmaceutical companies, and, per SEC filings, nearly half of the comprehensive cancer centers in the U.S.

IsoPlexis has raised a considerable amount of funding in the past from some notable investors.

Case Study: Technical Proficiency & Entrepreneurship

Login

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Emma Betuel @emmakbetuel / 4:03 PM EDT • October 8, 2021

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Case Study: Technical Proficiency & Entrepreneurship





Speak to an Expert

Traditional vs. IsoPlexis

Traditional ELISA Workflow

20+ hours of hands-on time 10+ instruments needed

Tedious steps like manual washes, multiple reagent additions, manual pipetting, and incubation cycles have become the norm in traditional methods.

Lab technicians are tied to the bench, attached to a timer for the entirety of the run, to perform each protocol step at precise moments.



Automated IsoPlexis Workflow

5-20 minutes of hands-on time 1 integrated system

Resources

With IsoPlexis' fully automated fluidics system, there are no manual washes, no reagent additions, and no need to perform standard curve serial dilutions.

Just pipette your samples into the chip, load the chip into the system, select the assay you'd like to run, and walk away!









SCIENTIFIC RESOURCES

Publications

Stay at the cutting edge of research & medicine

IsoPlexis University
IsoLight & IsoSpeak education & training

Product Literature & Protocols Datasets & resources

Webinars & Videos Learn from industry pioneers

The Single-Cell Proteomics Blog Latest news & articles

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IsoPlexis University

Transform your Immunotherapy programs with the latest data



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Technical Proficiency (and Technical Leadership) Questions

1/10/2022

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Technical Proficiency References

- "Transform Your Technical Expertise into Leadership" Harvard Business Review, May 2021 (available on-line)
- "Technical Leadership of Virtual and Remotely Distributed Teams" Francesco Dazzi et al, *31st Annual INCOSE International Symposium*, 2021 (available on-line)
- "5 Questions That (Newly) Virtual Leaders Should Ask Themselves" Melissa Raffoni, *Harvard Business Review*, May 2020 (<u>available online</u>)
- Technical Leadership Development Guidebook, U.S. Department of Defense, 2018 (available on-line)

Next Steps

• EL & R – Personal Conduct – all JAN



 Review Technical Proficiency Preview EL&R – JAN 24 (MLK JAN 17)



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