

BOARD #142: Learning 'Street Smarts' from Engineering Leadership Alumni: A Work in Progress

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Introduction & Background

This in-progress research project explores the value of using Alumni to inform engineering undergraduates about the nature of the industry and assist them in developing the necessary competencies to succeed. Students of the Engineering Leadership Program at the University of Colorado Boulder, explored "street-smarts--skills beyond the technical or theoretical knowledge--by engaging directly with alumni working in engineering industries. They then reflected on the conversation in an assignment, which were used as the data for this project. This project was motivated by the potential to learn how alumni view and utilize "street smarts" practically, offering guidance to current students for bridging academic knowledge with real-world challenges.

Objectives

Explore Alumni Perspectives:

Explore the potential value of researching alumni perspectives by discovering themes about "street smarts" that might emerge from an analysis of student assignments. The class assignments are reflections from the students on their conversations with alumni, and any themes that arise from them might inform the curriculum of this particular course.

Inform Curriculum and Future Research:

Utilize findings to suggest improvements in the engineering leadership curriculum, emphasizing practical skills essential for professional success. Inform future research projects that would further engage alumni in generating ideas about leadership and success in technical engineering fields.

Method

- 1. Gather Data** - Data consisted of 28 student assignments from three sections of an engineering leadership course.
- 2. Review Data** - Each assignment was read thoroughly, with initial notes and general observations recorded. Relevant external theories, such as Sternberg's Theory of Successful Intelligence (2005), were also reviewed.
- 3. Conduct Inductive & Deductive Coding**- Themes were identified using an inductive "open coding" approach. Additionally, three deductive codes—adapting, shaping, and selecting—were derived from Sternberg's work. These represent the abilities to adjust to, influence, or choose environments. While adaptability emerged clearly in the data, shaping and selecting were included to explore whether those aspects of intelligence appeared in alumni stories.
- 4. Color-Coding** - Each identified theme was color-coded across the assignments to reveal patterns and sub-themes. This visual organization supported thematic grouping and refined categorization.
- 5. Construct Analytic Descriptions** - Themes were used to create visual maps showing connections and contrasts between competencies. Themes will continue to be explored through memo-writing, summarizing key insights and applications.
- 6. Validate and Refine** - To ensure accuracy and relevance, analysis is reviewed by a faculty advisor. Their feedback continues to guide refinement of thematic analysis.

Results - Themes Identified

So far, the findings reveal that "street smarts" was a meaningful term to all of the alumni, and they consistently recognize its importance in their careers—often valuing these skills over other kinds of smarts, including purely technical expertise. Below are the five most prominent themes identified, but the rest are: Empathy & Consideration for others, Experience, Personal Investment, Humility,

Communication and Interpersonal Skills

Alumni consistently highlight the importance of clear communication and strong interpersonal skills, emphasizing that being able to express ideas and connect with others is essential for collaboration, influence, and making technical knowledge useful.



Situational Awareness

Alumni describe situational awareness as essential for professional success. It allows engineers to accurately read their environment, recognize key opportunities or threats, and make timely, informed decisions that align with team and organizational needs.



Goal Setting and Strategic Planning

Strategic planning is foundational to long-term success. Alumni emphasize setting realistic, actionable goals and continuously revising plans as a vital skill for navigating complex projects and achieving both personal and professional growth.



Intuition and Rapid Decision Making

Alumni stress that intuition, developed through experience, plays a key role in engineering. Making quick, confident decisions in uncertain situations is often necessary, especially when time or information is limited in the real world.



Adaptability

Adaptability is a critical trait, with alumni noting its role in managing unpredictable challenges. Engineers must adjust quickly to new situations, applying knowledge in flexible ways to succeed in complex environments



Future Plans

- Intentional Interviews in a team setting:** Engage a team of undergraduate researchers to conduct systematic interviews **directly**. Conduct systematic, structured interviews directly with alumni to explore these themes more comprehensively. This next stage of interacting directly with alumni will go much more in depth about what competencies are useful and specifically how to cultivate certain skills.
- Curriculum Enhancement:** Utilize alumni insights to design curricular and extracurricular activities that intentionally cultivate critical "street smarts" competencies identified in this research.
- Foster an environment of Student-Alumni Interactions:** Create a process in which students will communicate with alumni about the nature of the industry and how they can prepare themselves, and those students will then become the alumni that report back. Through this we can get real time data about what is useful in industry, and ensure we prepare in the best way.

Calvin Hawks - Engineering Leadership Program



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