

Engineering Mind-set

Engineering Mind-set ... Using engineering principles to analyze and use the Internet technology

2 page background

Problem statement: How can we use the characteristic of the engineering mindset to improve the accuracy and learning of Internet applications in students?

Create a grant that supports learning life skills (College & Career Readiness skills) using the Engineering mind-set while solving a community/world/education problem.

Background:

Students using the Internet technology achieve benefits for quick access to information and interaction with simulated group activities. Coming with this is the possible pitfalls that can occur if not analyzed correctly. As an example; finding information to a particular subject without checking such things as who the author's mission is, what's the source for the information and are there other views to consider, will lead the students to possible faulty conclusions. Using the tools of an Engineering mindset that are learned during a problem-solving process, student will be able to better use the internet without making mistakes in judgement and grow their skills.

Internet coverage:

This will cover the following areas of the internet:

Internet Applications	
Search	
Social media	
Games	
Learning platforms	
Videos,	
Shopping	
music, photos	

Engineering Mindset:

What are the aspects of skills in the mindset:

Engineering Mindset
Engineers thought process is all about thinking of solutions.



Engineering Mind-set

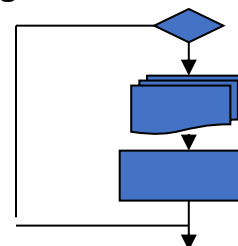
Engineering Mindset
Focus on solutions not problems Creating a better world!
Curious ... seeking to understand, Why is it this way How can I solve it? Doesn't hesitate to tinker with everything
Analytical mind.. Reduce problems to its components, Separate the trivial from the relevant, Write down the different parts of the situation
Thoroughly understand the situation Look for the root cause of the problem ... 5 W's What questions do you need answers too.
Sets in place Reqr. On how we the solution be measured before having the solution.
Look for lots of possible solutions, be free to creative in your solutions
Realize that solving your life problems is not a linear process. This prepares you for disappointment. There will be setbacks and the necessary tweaks. It is an iterative process
Works with others with their strength to help create the solution and pick the one you that matches the requirements best. Use your critical thinking skills to find the right solution.
Discus with your team mates and iterate back to try new ways for the best solution.
Test your solution to see if it works in the situation where the problem is
Is it sustainable in the environment? What feedback are you getting?

What is an Engineer ... Bernard Gordon

Real Engineer is someone who has not only the skills of Math & Science but also the skills to provide leadership in developing solutions to society's program and be able to communicate these life-skills to others. We will focus on these skills in the Engineering Mind-set. We will demonstrate using these skills by showing students how they can improve the use of the internet tools.

Bernie Gordon says engineers need better communication and interpersonal skills, a sense of economic discipline and an "interdisciplinary" approach that will enable them to conceptualize solutions and follow those solutions through the manufacturing process. Gordon emphasized the immediacy of the engineering problem in a keynote address, "What Is an Engineer?" presented to the European Society for Engineering Education Annual Conference in 1984, and now in its fourth printing.

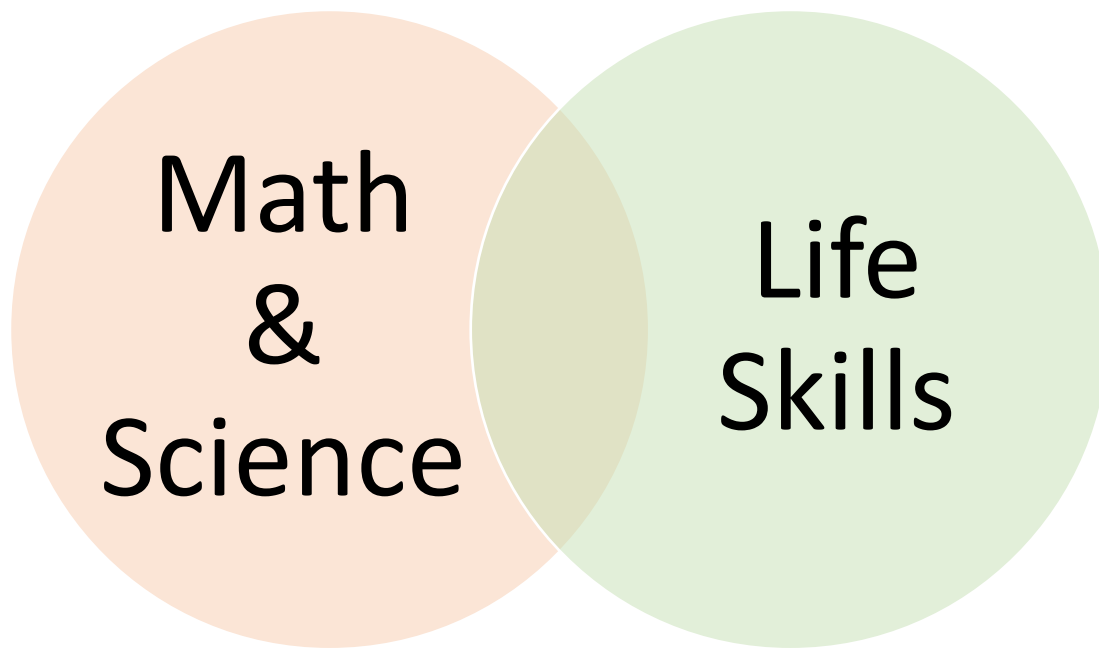
Here he proposes that the future depends in large measure on educating "real" engineers. A "real" engineer, according to Gordon, is not the "geek" or "nerd" who has sacrificed intellectual breadth and social ease for narrow expertise and introversion. Rather, it is a person who, because of his or her broad education and habit of thought, "can conceive and invent, who does not wait to be told to initiate, but imagines,



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**conceives, proposes, pleads and debates for a cause and an impossible dream.
Takes risks.**

The REAL Engineer is a leader who covers the discipline of design as well as the soft-skills needed in society



Design Process	Life Skills
Identify the need or problem	Curiosity
Research the need or problem	Listening skills
Develop possible solutions	Empathy
Select the best solutions	Teamwork
Construct a prototype	Trust
Test & Evaluate the solution	Respect
Communicate the solution	Taking risks
Redesign & Renewal	Communications

What is an Engineer?

Knowledge: The areas of required knowledge are not limited to those of science or technology, as a consideration of the role of the engineer as a leader will



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reveal. An understanding of societal evolution through study of history, economics, sociology, psychology, literature, and arts will enhance the value of the engineering contribution.

Skills: A real engineer's skills are essentially scheduled problem-solving techniques of design in which the concentrated disciplines of science and technology are exercised with the personal creativity and judgment developed from training and experience. In addition, because engineering accomplishments are achieved in a group environment, the communication skills are critical to the roles as follower.

Values:

Successful team leadership implies a degree of self criticism, where egotism and modesty have counterbalancing influences. It requires a spirit of curiosity and courage that leads to creativity and innovation. It is characterized by a forcefulness that gives orders, as well as receives orders, and accepts the challenges of competition in the market place with a perseverance to succeed

Leadership Capabilities (Gordon Engineering Lab)

Much of the GEL curriculum focuses on 14 capabilities that research and experience identify as essential qualities for successful engineering leaders. Each capability is explored in theory and historical context during a class lecture and is enhanced by stories culled from the collective experience of the program faculty.

To visualize the balance of personal strengths and weaknesses, the capabilities are depicted on a polar plot. Candidates begin the program by plotting a self-assessment of their capabilities, in addition to soliciting feedback from their supervisors and peers.

Based on this 360-degree feedback, Candidates gain a better understanding of their current strengths and identify areas for additional development. This diagnostic is repeated at the end of the course to measure growth.

[Initiative](#)[Decision-Making](#)[Responsibility and Urgency to Deliver](#)[Resourcefulness – Get it Done](#)[Ethical Actions and Integrity](#)[Trust and Loyalty](#)[Courage](#)[Vision](#)

Leadership Labs

Leadership Laboratories supplement each Engineering Leadership class session by enhancing the mastery of topics introduced in lectures. Through self-assessment, interactive role-playing, and case studies, Candidates explore topics through practical experience.

At the onset of the program, a group definition of leadership is developed and embraced. Candidates write a personal mission statement and learn the power that comes from living a life with



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purpose, integrity, and courage. They begin to hone their view of the world by understanding how judgment, prejudice, and perspective can be biased by their own feelings and experiences.

Building upon these leadership attitudes, the labs next acquaint the Candidates with the tools essential to leading people and teams.

Among them are:

- Creating a common vision
- Planning a project
- Organizing and inspiring a team
- Developing goals
- Assigning roles
- Setting expectations
- Providing feedback
- Negotiation
- Decision-making
- Conflict resolution
- Communication and presentation skills

Finally, the impacts of the business, cultural, and societal environment in which Candidates will lead are explored.

These include the ability to:

- Stay situationally aware in complex and dynamic organizational and business domains
- Account for cultural differences
- Maintain sound ethics
- Manage up and down
- Successfully maneuver throughout the extended enterprise

Labs are performance based and Candidates receive direct feedback at the end of each session. Labs are held both inside and outside the classroom, including a full-day Field Leadership Reaction Course (FLRC) exercise at nearby Camp Edwards.

