SCED 542 – William H. Green, Jr. – Comparative Engineering Design Analysis – September 26, 2019

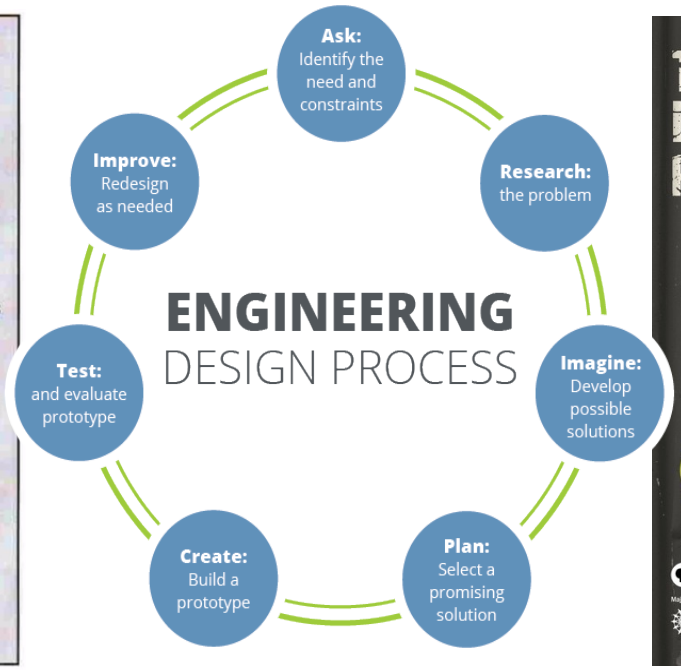
Dartmouth Design
PBS Design Process

NSF Design Matrix

Table 1.
Steps in the engineering design process used in the Thayer School of Engineering at Dartmouth College

THE DARTMOUTH DESIGN PROCESS

- Define the problem
- Restate the problem
- Develop constraints/criteria/specifications
- Brainstorm ideas
- Research alternatives
- Analyze alternatives by a trade-off matrix
- Identify a potential solution
- Research in detail the potential solution
- Design a potential solution
- Construct a prototype
- Evaluate prototype
- Reiterate if necessary
- Simplify if possible



Synthesis of Engineering Designs

Similarities:

- All designs begin with the PROBLEM.

- All ask to RESEARCH either the problem/solution before attempting to BUILD.

- In every design a PROTOTYPE is built.

- All designs support TESTING their prototypes to encourage learning and redesign.

- All designs are applicable for High School (9- 12) classroom settings.

- Highly Student Centered

IDENTIFY PROBLEM

RESEARCH

BUILD / TEST

REDESIGN

SHARE SOLUTION

Differences:

- All designs have different number of steps.

- The PBS design explicitly states to “share solution”.

- The Dartmouth Design is linear where the NSF is cyclical and the PBS design is a hybrid of both.

- The PBS design is a more kid friendly approach and has a built-in incentive (the tv show).