

## Views of Nature of Engineering Questionnaire

**There are no “right” or “wrong” answers to the following questions. I am only interested in your opinion on a number of issues about engineering.**

1. What, in your view, is engineering? What makes engineering different from other disciplines (e.g., science, philosophy, religion)?
2. How do you define the work of an engineer? What do engineers do?
3. What is an engineering design process? *EXPLAIN YOUR ANSWER WITH EXAMPLES.*
4. After engineers have developed an engineering design does the design ever change?
  - If you believe that engineering designs do not change, explain why. Defend your answer with examples.
  - If you believe that engineering designs do change, explain why.
5. Do engineers use their creativity and imagination during the engineering design process?
  - If yes, then at which stages of the engineering design process do you believe that engineers use their creativity and imagination: identifying the problem; developing the design conceptually; constructing the design, testing the design; refining the design? Please explain why engineers use creativity and imagination. Provide examples if appropriate.
  - If you believe that engineers do not use creativity and imagination, please explain why. Provide examples if appropriate.
6. Some claim that engineering is infused with social and cultural values. That is, engineering reflects the social and political values, philosophical assumptions, and intellectual norms of the culture in which it is practiced. Others claim that engineering is universal. That is, engineering transcends national and cultural boundaries and is not affected by social, political, and philosophical values, and intellectual norms of the culture in which it is practiced.
  - If you believe that engineering reflects social and cultural values, explain why and how. Defend your answer with examples.
  - If you believe that engineering is universal, explain why and how. Defend your answer with examples.

**Consider including some wording probing the influence of engineering on society as well**

7. There is a variety of soda can crushers commercially available in the market. Put pictures here.  
Can there be a single best design for a soda can crusher?

If you believe that there is a single best design for a soda can crusher, please explain why.

If you believe that there is not a single best design for a soda can crusher, please explain why.

**Notes:**

**We might include three questions:**

**Empirical aspect**

**Social aspect and**

**whether engineers follow the steps of the engineering design process in a linear format.**

**We might want to ask a question about the relationships among engineering, science and technology in question 1 or after question 1.**

We realized that some teachers thought that engineers do not use their creativity during testing their products/designs.

During the workshop, we did not take much time to connect what they have done to connect overarching engineering ideas. More need for reflection connecting the design activities with contemporary conceptions of engineering.

Empirical NOE and demarcation criteria should be explicitly mentioned during reflection.

There should be question assessing social aspect. This aspect also should be explicitly mentioned during the workshop.