

Questions 1-10 below are the results of pre and post test questions about the design process. There were 32 responses to each question. The first number represents the number of correct responses on the pretest and the second number represents the number of correct responses on the post test. The questions were worded exactly the same on both tests but on some questions the format of the question was different between the two tests.

Question 11 are selected responses from a freeform question asking the students what they learned by doing the semester project.

1. In which two steps of the DMAIC process would brainstorming be most useful?

	Pretest	Post test
Define	19	25
Improve	21	14

2. The engineering design process is _____.

- a. An iterative process 9 24
- b. A quick process
- c. A process that creates one prototype
- d. A process with a beginning and an end

3. Industrial engineers usually design _____.

- a. Products
- b. Processes 29 30
- c. Companies
- d. Prototypes

4. In which step of the DMAIC process should the Voice of the Customer be considered?

Define	9	26
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5. What is the purpose of the engineering design process?

- a. To develop risk free designs
- b. To develop a marketable product
- c. To linearly arrive at a design
- d. To systematically generate and evaluate solutions to stated objectives within specified constraints. 30 26

6. One model of the engineering design process is the DMAIC methodology. What does each of the letters stand for in the acronym? (5 points)

D –	2	20
M –	2	31
A –	3	31
I –	4	30
C –	4	30

7. In which step of the DMAIC process should baseline metrics be gathered?
Measure 26 29
8. Which solutions should be considered first?
a. Simplest 22 23
b. Hardest
c. Most innovative
d. Most fun
9. In which step of the DMAIC process would a root cause analysis be most useful?
Analyze 14 27
10. Documentation is _____.
a. Not part of the design process
b. Most important in the C step of the design process
c. Most important in the D step of the design process
d. Important in every step of the design process 26 25

11. What did you learn about the engineering design process from doing the project with the FabLab?

By doing the FabLab project I learned to follow the processes (DMAIC) by each step. I learned to find the problem and set goals, get data, do the right flowchart. I learned to analyze the problem and do the fishbone. Basically, I learned how to improve and generate solutions to specific problems.

I learned that the engineering design process never stops.

I learned that using the DMAIC system to break down the problem in parts is very helpful. The engineering design process is long but is broken down step by step so you can focus on a specific aspect of the system to improve so that you aren't overwhelmed by everything all at once.

All systems have problems that can be improved. Some improvements lead to more problems.

The one thing I learned the most is how to analyze a problem as a group. We all had great ideas and as a group we analyzed each to determine which added value to our project.

I learned to go in and interview people who work there daily to get input on where problems occur and what improvements could be made.

I learned that you can apply the design process to any type of group project you work on. The FabLab project was my first exposure to apply the design process to anything.

It's never beneficial to jump straight to conclusions when dealing with a problem. If the problem is broken down into separate parts and worked on step by step, the solution would be productive and efficient.

I learned how important teamwork is throughout the project. Specifically in the Design and Analyze steps where a lot of brainstorming was required. The entire process would likely be a lot more difficult to accomplish, especially with only one person's point of view and ideas.