

# **Dream It Focus Group**

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## **Dream It Project Focus Group**

My Dream It Project is titled "Engineering is Everywhere". My Dream It Project was to show teachers that engineering could be incorporated across all content. I conducted two focus groups: one was a focus group of 8 teachers and the second was a focus group of 15 students. My focus groups yielded two very different results.

### **Teacher Focus Group**

I conducted my focus group with eight teachers from various grades. Since writing my Dream It Project with the purpose of teaching teachers that engineering can be cross-curricular, I have wondered about the actual reasonableness of achieving this project. Therefore, my specific purpose and objective of this focus group was to test the waters for engineering content knowledge, technology knowledge, pedagogy knowledge, and specifically willingness of teachers.

I started my focus group with presenting the teachers with my goal of the Dream It project and asked them candid questions to get their feedback. The questions that I asked them was, "How comfortable are you with science", "How comfortable are you with engineering", "What's your level of science knowledge", "What's your level of engineering knowledge", "What are best practices in teaching science", "What are best practices in teaching engineering", "What is engineering", "What's your knowledge level in technology", and "What are best practices for technology integration in teaching".

This teacher focus group confirmed my fear that I needed to take a third look into my Dream It project and redefine the goals and/or move the goalposts. The comfort and knowledge level in science varied from "I love teaching science. I teach it everyday", to "I don't like science. I feel that we need to work more on literacy". The comfort and knowledge level in engineering was heavily weighted towards teachers not knowing what engineering was and feeling inadequately trained to teach engineering to students. The technology knowledge was varied. Some teachers loved

technology and relied on it for class records & management (Edmodo, Class Dojo), learning (Khan Academy, iPads), and communication (websites, blogs, Google drive). Other teachers only used technology for grade book, e-mail, and document cameras. In general, most teachers did not respond favorably to engineering and my Dream It Project. Teachers have been overwhelmed with the new Expeditionary Learning curriculum the new math curriculum and now the push for science and engineering. We have fantastic teachers, and they are indeed already going above and beyond this year, so I know that they are being honest about what they can accomplish.

### **Student Focus Group**

My focus group was made up of fifteen-6th through 8th grade students in a self-contained special education classroom. My purpose and objective of this focus group was to use the time in science to introduce engineering and to show them where engineering is in their lives , hence, “engineering is everywhere”.

Since their teacher had been reading about electricity in their science time, I decided to stick to that topic but incorporate a more hands-on learning approach. I used the five Snap Circuit kits from my engineering classes. I had just been reading about best practices in teaching science and decided to give them concrete experiences before teaching them any terms or “front loading” any knowledge. Since this was their first experience with Snap Circuits, I did go over the safety basics of connecting circuits and I modeled the right way to connect components and read the diagram. Also, since my students ranged from sixth through eighth grade, I also started as a whole group “We Do” lesson, meaning we started with our first project, which was the Light bulb and Switch Circuit, as a whole group. We all read the diagram, found the first component and once every one placed it onto the circuit board, we went on to the second component and connected that one onto the circuit board, and so on. This was a very slow process since we had to wait for everyone to be ready before we could all move on to the next step. However, it reaped dividends by the second project because at that point, I let them build the second project, Motor and Switch Circuit, alone in their small small

groups. They all did this much faster in their small groups and they were able to troubleshoot by themselves when some of their circuits did not work!

After every project, I had the students write in the science/engineering notebooks that I had provided. I had explained that scientists and engineers use notebooks to record observations, notes, and their learning process. I also modeled on the board how to write in their notebook. After every project that they built, I then facilitated in a whole group and small group discussion about the purpose of the circuit and we talked about the role in engineering in the project. Some questions that I asked were, "What is the purpose of this circuit", "Where have you seen or used a circuit like this", "How does engineering these circuits help us in our lives", etc.

The student response was overwhelmingly positive. The students really enjoyed the hands on interactive nature of the focus group. Honestly, I feel because they had just been reading about electricity, once I introduced them to hands on learning, it was easy for them to be excited about learning. I was amazed how easy it was for them to understand how to build the circuits from the diagrams. There were some problems in connecting and making the project work, but it didn't frustrate them. Working in small groups really helped them be successful.

Also, I was surprised how the students were able to make the connection between the circuits that they built and the circuits that they use in their lives. They were able to see the engineering in the circuits and how they benefit from the circuits. They named so many ways that circuits are used: alarms, lamps, fans, blenders, cars, lights, streetlights, washing machines, etc.!

### **Dream It Modifications**

Reflecting, I need to rethink my Dream It project milestones and goals. I don't think it is realistic to think that a teacher can create their own cross curricular engineering lesson plans this year. I know that this Dream It Project is a one year project, but realistically, the Dream It project that I chose has to be layered and in a two to three year project span. If we were to stick to the one year plan, then I would have to modify it so it can be achieved in one year. One example would be that teachers

would be trained to teach engineering in science. They would understand the engineering design process. I will discuss this further with Akesha and get her feedback. The students are ready for engineering as evidenced by the positive results in my focus group; however, I need to figure out how to make this happen with our teachers.