Engineering Design Challenge: Make a Pillow for Ellie Elephant

The preschool students were extremely engaged during their engineering design challenge. The students have not encountered an actual engineering design challenge, so I had to pose questions and explain who engineers are. I also taught them a song about engineers that tells about the engineering design process (explore, create, and improve) they would use during the challenge, which they enjoyed singing. The challenge was to make a soft pillow for our stuffed elephant Ellie.

EDP phase one (Explore): They were given four different items in bowls to explore (one-inch plastic cubes, cotton balls, cotton swabs, and small squares of felt). They handled each item, and some students started noticing the differences between the items; some were harder than others, and some were much softer.

EDP phase two (Create): I reminded the students we were to make a soft pillow for Ellie. I teamed them in groups of two, except one who worked by herself, and handed them a small drawstring bag for them to stuff with their choice of materials from the bowls. The students stuffed their bags. When they finished stuffing their bags, we allowed Ellie to test their designs. The students allowed their classmates to examine their bags before Ellie laid her head on them. The students noticed the bag with the plastic cubes was the hardest one of all, so when Ellie laid her head on that bag, one student said Ellie was not very comfortable and was able to explain why she was not comfortable.

EDP phase three (Improve): After Ellie tested all the pillows, I asked the students if they could make their designs better. Most of the students grabbed their bags and unstuffed them and restuffed with softer materials or put more soft stuffing in their bags. They then allowed Ellie to test the pillows again. Ellie seemed very satisfied with the results!

We discussed ideas to make Ellie even more comfortable. The ideas were to make a blanket, make a bed, and make a bigger pillow.

Several things could have been better. One aspect, though I had no control over this situation, was that three students were absent. I have ten preschoolers in my class, and having three absent made the groups uneven. My original plan was for five students in each group. I made a last-minute decision to allow two more students in the group so I could go through the challenge with them all together. It worked out okay, but it would have been better to have five preschoolers instead of seven in the group. Another aspect was that I could have had another adult in the room with me. I did have someone for a few minutes to take a few pictures at the beginning, but I should have asked her to stay. If I had had extra help, I would have seen that one student decided her pillow design was fine and did not improve hers. By the time I noticed it was too late! Her pillow was soft but a bit overstuffed; it could have been better. Also, the teams could have been grouped better. Some of the students were having "issues" apparently, and did not want to share some of the responsibilities. I am thankful for them being so enthusiastic about the challenge, but we must share! If I were to use this activity again, I would make sure to group students better and in smaller groups.

I believe the pillow challenge was the right choice for the preschoolers I teach. The idea engaged them immediately and made them excited to do the challenge. Excepting the few problems we had, the challenge was the perfect complexity for the preschoolers.