My professional development was given in Manalapan, NJ, specifically at Taylor Mills School. Our district is considered a large suburb district, and has roughly around 5,000 children k-8. I narrowed down my professional development group to just the 5th grade teacher in the district which is approximately 15-20 teachers. I choose this group of teachers because their students are the ones who have had the most experience with technology and will benefit the most from the Makey, Makey this first year. Each classroom consists of about 25 students, and the 5th grade teachers all teach multiple subjects; Math, Science, Social Studies, Reading/LA, etc.

I foresee more professional development come as a result of my presentation and then a turn key at each school for the 3rd and 4th grade teachers. Our curriculum is focused on making a complete transition to the NGSS standards. The engineering standards that I think the teachers will be applying are; 3-5-ETS1-1, Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost, 3-5ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem, 3-5 ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved (NGSS Standards). The teachers will choose the content that they would like to apply the Makey, Makey project to, which in turn, will touch on many more standards of the curriculum.

My Professional Development audience was very receptive and engaged. I had 15 teachers attend and I'm confident that many of them will try this project this year. Two have already reached out for more help getting this project rolling in their classrooms. All teachers in my professional development session were 5th grade teachers who teach all subjects like I mentioned above. They all have 1 to 1 chromebooks in their classrooms, and have had several inservices on NGSS. Not one of these teachers have used the Makey, Makey before, and several of them had never heard of it either.

I set out to give the teachers in my district an idea of how we can start to move coding off the screen in to the children hands. How engineering can be attainable in our classrooms with a little practice and support. I wanted to walk away from the professional development session and  have at least a handful of people who are comfortable enough to take the challenge, and do a trial with the Makey, Makey in their classrooms this school year. I wanted to make sure that my teachers had the resources and support that they needed to be successful, and have a positive experience with the Makey, Makey. I feel like that was accomplished through the lessons I gave them for Scratch, and the many examples and resources that I gave them for the Makey, Makey.

My pre-question survey list was very eye opening. I asked routine and basic questions about their knowledge of content and pedagogy pertaining to my professional development. I found that majority of the teachers had so little content knowledge on the topic, and few even had thoughts on the pedagogy of teaching coding. Some of the questions I asked were; on a scale do you use coding in a classroom? Do think its important to  teach it? Have you ever tried Coding or robotics in your classroom before? How hard do you think it is to incorporate? Have you ever heard of Makey, Makey? What about Scratch?

By the end of our session I would like the teachers to understand that coding and robotics are teaching our children how to be problem solvers and to work collaboratively to overcome challenges. The teachers will be giving the students all the tools that they need to be successful. By teaching STEM, coding and robotics we are preparing them for anything not just specific situations.

The steps that my professional development training took and a brief description of the activities that were completed are;

1)      pre-question survey; questions listed above

2)      Brief introduction to why I thought this was important to share with my colleagues. Also, I shared these websites listed below with my colleagues to show them some amazing resource they can use.

https://www.nasa.gov/kidsclub/index.html

https://www.nasa.gov/audience/foreducators/computer-science-basics.html#2

3)      I shared a Scratch presentation that I made, and an example of one my 5th grade students made. I hoped that this would help my colleagues see the possibilities of what the 5th graders could do.

4)      https://www.jpl.nasa.gov/edu/teach/activity/explore-mars-with-scratch/

I shared this link to  "Explore Mars with Scratch" because it is a link to a NASA scratch project that would be really fun to complete with 5th graders. I took about 10 minutes to show the teachers and walk through with them, so that they could see the awesome resources that are out there through NASA.

5)      Next I did a discovery session: Teachers were given a lesson on scratch and an opportunity to have some hands on experience with the program. This is essential to learning. It is important to let the students know  that they will be using trial and error and watching what happens on the screen, then adjust the commands that they give the computer to make a more satisfying event occur on the screen. This is the same lesson I taught the teachers at my session. Then I supplied them with multiple lessons to further develop their scratch, coding skills so that they can be more confident with their own skills and knowledge when they teach the students.

6)      After that I set up stations with 4 examples of how Makey, Makey can be used in the classroom. Teachers rotated to each station to see the Makey, Makey in action.

7)      We walked through a basic lesson of the Makey, Makey and I gave them a

detailed list of Makey, Makey resources on the Smartboard.

8)      Next we did Makey, Makey practice. Each small group of teachers had a chance to try out the Makey, Makey and program it to work in the fashion they wanted to. This was a very important step in learning coding and robotics. I truly believe hands on practice, and trial and error are essential to learning.

9)      I ended the session with sharing the projects that the teachers were comfortable sharing, and a quick survey about the pros and cons of the professional development. We quickly discussed what questions they still had, and what they hoped to do with the information they just obtained.

10)     Lastly they filled out a simple post-survey that asked; on a rating scale of 0 to 5 how useful this training was to their everyday teaching. How likely they are to try one of the activities I spoke about/presented. Do they feel more comfortable with engineering and technology in the classroom then they did before. Etc.

### *Outcomes:*

My pre-survey results showed that majority of my teachers were very uncomfortable with using coding and engineering in their classrooms. None of them had ever attempted anything like the Makey, Makey before, and few of them have ever tried real coding. The content in my project directly meet their needs, since my professional development was an intro to the Scratch coding program, as well as the Makey, Makey tool.

I also saw in the presurvery, that many of the teachers didn't have a strong understanding of the pedagogy behind coding, engineering and technology. I addressed this in my content often, stressing that these types of activities were building a new type of learner, an independent problem solving learner. One who is ready for any challenge, not just challenges in isolation. The learners that they will become will be learners that can assess a situation,  make a plan to try and help it, if their plan is not successful they tweak it to get the outcome they wanted.

I believe that my professional development was extremely successful. I have two or three teachers already trying to implement the starting lessons I suggested. These lessons will prepare them enough to implement a Makey, Makey project this winter. The post-survey results showed me that ALL of the teachers had gained confidence in trying coding and engineering. They all agreed that the pedagogy is sound and through these types of activities the students will become stronger learners.

I kept the words of "Not Another Inservice! Meeting the Special Education Professional Development Need," in my mind as I planned my professional development. The article focused on the fact that professional development needs to be meaningful, continuous and differentiated. As I planned my professional development I reminded myself that each classroom was going to have different needs, and they will want to use what i'm teaching them in different ways that work with their teaching style, comfort level, and students abilities. I made sure that I had options available for them,

and there was always time built in for people to ask questions, and for other to move ahead to try things out. I also think this article brought up a good point that professional development isn't meant to be given in one day and never discussed again. Therefore,I made sure that my teachers knew that I would be checking in with them often, and reaching out to see if they need any help. I offered to videotape a few of my lessons with my own students to share with them when they are ready to give this a try as well.

The other article I related to my professional development was "A Primer on Effective Professional development." This article focused on the formal and informal professional development and how learning from your colleagues is an important way of professional development. I kept that in mind, and I found that not only did I teach the teachers who attended a lot ,but they had great ideas too that I will add to my classroom. It is essential to have a comfortable and open dialogue when it comes to professional development and every one has to come to the table with an open mind.

I strongly believe that these teachers that came to my session will go out and do these activities that I taught them. Looking back I can  remember how excited some of my teachers were and the were already planning the best time and strategies to use what i was showing them. Since the professional development day, I have been in contact with a few of my colleagues who were planning their lessons based off of my professional development. I believe that these types of activities will turn key in all of the buildings and will be passed across grade levels like I intended.

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