HS Robotics
Materials Interview

Interviewer: Please describe the instructional materials that you're using for the lesson. Could be curriculum or could even be the robots or it could be the balls or even the structures that they're working in.

Teacher: The students are taking an Industrial Engineering Technology core class. They're mixed in with students who are taking Engineering 1. Some of them are taking the Industrial Engineering Technology Capstone course. We have them all mixed with each other. Through the CT program, there is a set of benchmarks and standards we need to meet in addition to the GLO's, the General Learner Outcomes, as well as what's the school wide student learning objective that they want all teachers to focus on and for this year it's persuasive writing, so we look at those things.

We're a program where we build robots and we participate in competitions. For me, I try to take the reverse ... We try to do it somewhat different where we look at the competition first and see how can we incorporate all of the things that we need to input into the whole competition experience that shows that students are getting something out of the program, the learning experience. I ask the students, "What do you want to get out of this competition?" Of course they say, "Well we want to win." That's great but what does it mean to win? What does it take ... Let's define what winning is. Let's go over those big ideas.

[00:02:00] They say things like, "You know, we got to be responsible. We got to be proactive. We got to keep working at our design. We have to problem solve. We have to go through this whole engineering design process." Which is an iteration of ideas and putting something down on paper, building it, testing it out to see if it works. If it doesn't, then of course we have to go back and we look at the things that didn't work and try to improve on those areas and overall hopefully we make progress.

I think the hardest part for students in following this curriculum is that a lot of times, with those buzz words, they understand what problem solving is. I mean they understand what the word means, but it's living it. The hardest part is when it doesn't work. The students get frustrated and then I can't fall back on their curriculum or certain standard and say, "Well you know, you got to follow this and this is what's going to make it better." Sometimes it's the other intangibles. It's not giving up. It's teaching kids that if there's a problem, you do whatever it takes, you get whatever resources you need, you work with your teammates, you talk to your mentors and get input, and hopefully you can come up with a better solution.

I think one of the biggest problems with our students, I think a lot of students, is they complain about well the teachers are not teaching. What do you mean by we're not teaching? Well, they want the answers. They want us to tell them what either the answer is or they want us to point them in the direction that gives them the answer, but for our curriculum we don't do that. It's all inquiry based. It's all design process. We want them to figure it out. My job as a teacher, as far as the materials go, is I can

[00:04:00] provide all the robot parts and everything else but I'm not going to give them a prescribed step one do this, step two do that, and so on. Instead, present the big ideas and have them focus on the process and through that process figure out for themselves what I need to do to be successful.

Interviewer: What is it ... Can you maybe describe some of the instructional materials that you might see in the classroom setting?

Teacher: When we participate in this competition, there's three main parts. One is the actual building of the robots and they go through that engineering design process. We give them a chart basically and we have them follow through certain steps. The biggest part, which is the other part, is they got to document what it is that they're learning. There's self-reflection, meaning that the students create daily journal entries. They can put pictures on there to help describe what they're doing. If they're doing a CAD drawing to develop and create a certain part, they can include that as well. But in the end, besides describing what they're doing, it's also reflecting on what worked, what didn't work, and putting all of that down into a notebook.

In addition to that, we have rubrics that the competition has already developed and presented to us. What that does is it grades your engineering design notebook to ensure that the kids followed the process, and to ensure that they went through those necessary steps, and to authenticate that this is their work, as opposed to maybe a
[00:06:00] mentor or a teacher or another adult just giving them the answer and then building from there. We don't want them to just build from a blueprint, we want them to develop that and document that process as another part.

Then the third part is there's actually a rubric for presenting their project. At every competition there's judges and they interview our students and they ask them questions about how they developed what they developed. Those presentation rubrics look at their writing. It looks at how they communicate their ideas and so on. Again, not just building but also documenting what they're doing and then focusing on a presentation that they do to a panel of judges.

Interviewer: That was cool to see the other students documenting with the videocameras during that particular lesson.

Teacher: We actually videotape ourselves so that students can see ... Sometimes unless they see themselves on camera, they can't see what areas they could improve on or maybe even see the good things that they're doing and building on that. We think that by doing that it's another type of self-reflection. We want our kids to self-reflect as they focus on those areas that the rubric calls for.

Interviewer: Why did you choose these materials?

Teacher: Well that's easy. We don't want to recreate the wheel. We're going to go with the rubrics that everyone else is working with. We are doing a competition and so I think

there's nothing wrong with using what's there. Maybe we could tweak some things a [00:08:00] little, and we do, but basically we start with that framework and then look at maybe what our kids need. A lot of our kids have a hard time doing public speaking, so maybe we would spend more time on that and have a greater emphasis on their grades through the reading and writing and presentation part. Basically we take what the materials that was already developed by another group of individuals.

Interviewer: What is it that you like about these materials?

Teacher: I think it's real life. Learning doesn't take place in an hour and a half class, 90 minute class, Monday, Wednesday, Friday. When kids get out there, it could be 24 hours in one day, you could have the next day off. You have a presentation to do two days from now, it's not just spending one hour each day on it, you might spend more time on it. It's great because it teaches our kids that there's deadlines and that they got to figure out how much time they need to spend, how much time they need. They got to account for things that may go wrong and figure out for themselves, through self-directed learning, what they need to do in order to be successful.

We're in a setting where there's a big block of time. It's in a setting where our kids are working with each other, where teamwork is critical. It's not where I'm just standing there the whole time just telling them what to do. I'm on the side as a facilitator. The teachers are actually the students themselves driving what they need to do in order to be successful.

Interviewer: Would you make any changes to these materials?

[00:10:00]
Teacher: I think, as I mentioned before, I think the materials that we're using for the curriculum is okay. If anything, if our kids have any weak areas, maybe spend more time on certain parts as opposed to spending equal amount of time on all the different parts that maybe some other schools might do. But you know, we know our kids best. We understand our community. We understand what our kids need and so we want to focus on the areas that they're having a harder time on and basically just spending more time on those parts.

Interviewer: How would you describe these materials as meaningful and relevant to students lives?

Teacher: Well, we're not going to be successful at a competition if it's not relevant for students. In terms of relevance, I think it goes hand in hand with rigor. I think the more complex rigorous tasks you challenge your students, I think it helps make it more relevant for them because they understand that they got to work pretty hard in order for them to be successful. Relevant in a sense that every day we're ... We basically problem solve every day in our daily lives. There's going to be times when things are tough and we don't want our kids to just give up or avoid challenges, we want them to tackle it the best they can. I think this project is very relevant because it forces our kids to do that and it's in a dynamic setting, just like how every day life is. Yeah.