HS Robotics
Pre-Interview

Interviewer: All right. Why did you choose to teach this lesson?

Teacher: Our program participates in both the VEX and First Robotics Competitions. They happen
                 both in the Fall and the Spring respectively, so because right now we're in the Fall
                 period, we chose to focus on VEX robotics. This particular lesson focuses on the building
                 and construction and having our kids prepare their robots in preparation for the Hawaii
                 state VEX championship that's happening soon.

Interviewer: What are the learning outcomes for this lesson? How are they related to the whole
                 larger sequence?

Teacher: As soon as you're taking a course called Engineering 1 and Engineering 2, and in those
                 courses we have a set of standards and benchmarks that we're supposed to achieve as
                 outlined by the Career Technical Education Department for the state of Hawaii. We try
                 to achieve those objectives and those outcomes. Primarily focus on these particular
                 standards, primarily, which is the engineering design process where students have to
                 follow this iterative process in order to come up with an idea, a concept, and then be
                 able to work on their project. Come up with some solutions. Develop a prototype, and
                 then ultimately coming up with a solution that they feel comfortable with in
                 participating with this competition.

Interviewer: How would you describe this lesson as meaningful, useful, relevant to the students?

Teacher: All of our students took this class because they're interested in some type of STEM
                 related career post-high school. We feel that this program does bring out, or does allow
[00:02:00]   our students to pursue and learn specific activities that will help them work towards
                 those STEM career goals.

Interviewer: What are the big questions that you're using to drive student work and discussion?

Teacher: Whenever we have students work on their projects, there's two main questions that we
                 always try to keep in mind and have students always ask themselves as they're
                 designing their robots. One is how do you maximize that design and that concept that
                 you have to scoring as many points as you can? In this years game, it's called Nothing
                 But Net where robots have to shoot these balls into this net in a two minute time
                 period. How do you maximize that? Is there ways to improve what they have currently?
                 After doing a competition, how can you improve on that? If you made thirty shots in one
                 match, how can you make it forty the next time? You have over a hundred balls on the
                 field. To me, if you still have some left over there's always room for improvement.

Interviewer: That's a great big question, that one was awesome. How are you planning to check for
                 understanding or assess the student learning outcomes?

Teacher: Okay, one of the things that we have all our students do is create an engineering design notebook. In that notebook students basically tell a story, and tell us how they got from the concept that they thought of down to the actual robot final product that they built. One of my requirements is to have them do daily journal entries where they incorporate some of their self-reflective thoughts. They use CAD software to display what it is that [00:04:00] they built or that they're trying to build. They have data, could be graphs, some kind of data table that demonstrates what kind of testing they've done. Ultimately they have to have a portfolio that demonstrates what they've learned.

In addition to that, students participate in local competitions throughout the entire semester. After each tournament our students come back to school and they self-reflect on what the good things were, what things didn't go so well. They talk about some of the challenges that they had that they didn't expect and work to minimize those things and make their robot better for the next event. Ultimately the competition serves as a formative assessment in working towards their ultimate goal in performing as best as they can at the Hawaii state VEX championships.

Interviewer: How would you describe this lesson as engaging for students?

Teacher: I think building robots in itself is something that's engaging for kids. It's hands-on. It's in the area of their interests of STEM. They're able to compete in competitions, they participate in interviews with judges to explain what they've learned, what they've done, what they came up with. Beyond the classroom there's a lot of opportunities for them to showcase what they've learned, and I think that in itself helps or lends itself to engaging students as a whole.

Interviewer: How do you plan to manage student behavior throughout the lesson, starting with expectations?

Teacher: The overall, in this whole overall learning process, the things that I try to get our students to focus on are the general learner outcomes. The general learner outcomes, [00:06:00] there's six of them, we focus on four of them in particular because that in itself models the culture that we want for our program and how students should behave, and how they go about working in teams and working together so that they're able to maximize their abilities as a whole in putting out the best product that they can put out. Let me just read what some of those things are.

Being a self-directed learner. Where students don't need a teacher to explain to them every little step. They're able to work by themselves and figure out what they need to do.

Being a community contributor. It's understanding what's essential and what's involved as far as all of them being able to work together.

Being an effective communicator. If they have questions they should ask those things, they should always ask themselves questions. Why am I doing this? How can I make

things better? Asking each other questions so that they feed off each other and working together, and of course being effective in ethical use of technology.

How do you be self-directed in not only working on your project, but utilizing the technology that's provided in helping you do this project? Ultimately I think those four out of the six general learner outcomes helps manage the behavior and the setting and the culture of our classroom.

Interviewer: Awesome man. Out of all the interviews we haven't heard anybody mention GLOs. I love CTE because it's real learning and it's real behavior you know? Sometimes sitting at a desk, reading a book or whatever people are doing is just so abstract. It's cool.

Teacher: The one thing you'll find is I do very little ... I'll talk at the beginning of class so that
[00:08:00]   everyone's on the same page. We remind everyone about the upcoming deadlines and what we need to focus on, and then after that I just let them go. They pretty much are self-directed. One thing that I want to mention which I think is a key part of why we are successful, we're limited as far as resources. I don't have teachers aids. We don't have the kind of support that I think an ideal classroom would have. How do we get over those limitations? A big part of our program is that peer mentorship.

We have a lot of veteran students that have been in our program three, four years, and you have a first year kid. How does a first year student figure out what to do? How do they become self-directed? How do they maximize their time? Especially for an hour and a half class period. We have our other students in there that are modeling what that right behavior is. When they see that, and they see that their robots are better, then they know I got a lot of work to do. I need to look at what those guys are doing to be successful and I need to emulate some of that stuff.

We've created that culture primarily, the number one influence is not because of myself or the mentors that come in to help our program, but it's the other students in the classroom that set that tone. That to me is the number one reason why we're successful.

Interviewer: I think that's awesome. Cool. What a great ... It's so nice to hear that. I believe that excellence definitely comes from the culture as opposed to an individual.

Teacher: Yeah I can't have five guys working on ... I mean we've got kids working on other projects. In fact during the period we'll have some that are working with another
[00:10:00]   mentor on our water jet. We have some that are going to be documenting. How do you manage all these different areas with one teacher? You can't. You need student leaders.

Interviewer: Real authentic belief in what the individual student is doing.

Teacher: Actually my job primarily focuses on those student leaders. By me focusing and discussing with them what the expectations are, then it filters down to all the other kids. Now you're not always going to get one hundred percent participation or attentiveness

all the time, but generally speaking I think for the most part it happens. Students have their own set of their time tables, and how they go about and how they want to manage x amount of time to do a particular project. In the end, I think in the end, when you see all of our teams being successful ... You know, different teams have different people that are unique. They're going to do things their own ways in certain aspects, but in the end when they all deliver a product that's something that they're proud of, and that I'm proud of too as well, I think that's what matters in the end.