Science Modeling Talks

Episode 71 - "Hosting Modeling Workshops at Cal Poly"

Guest: Chance Hoellwarth

Mark Royce (00:49):

Hello, Dr. Hoellwarth. How are you today?

Chance Hoellwarth (00:52):

I'm very good. I'm happy to be here.

Mark Royce (00:53):

Awesome. I'm really glad you're here too. This is exciting to me to talk to you because you have a unique perspective on modeling instruction from a lot of the interviews that I do, and this is gonna be very interesting time together, I think. So, we can just jump in. People can look at your bio on our website and learn more about you. But for right now, I just want to dive into this. So I wanna find out how you were first introduced to the idea of modeling instruction. Where did all that happen for you?

Chance Hoellwarth (01:32):

I think it happened for me at an AAPT meeting in the early two thousands, maybe even in late nineties. I had heard like modeling and I just, that sounded like something I wanted to know about as a teaching methodology, but it seemed very abstract. I think, looking back at it, I think that they hadn't quite developed it all at that point. And I think this was Jane Jackson going around and sort of starting the process of letting everybody know that it existed. And that's sort of where I first heard about it, and was like, oh, I need to find out more. But I didn't really find out more for another 10 years when I really got involved with running a center and trying to think about PD that might be useful to teachers and really had started to think about how do we help teachers teach science by doing science, that kind of a thing. And so then I went to a, we actually hosted a modeling workshop, I think at Cal Poly. I wasn't actually in the country at the time, but it was super successful. I think teachers found it really useful. And then when I came back, I'm like, okay, now I really need to know about it. And so I went to ASU and did one of their three-week sessions or workshops, you know, right there at the source.

Mark Royce (02:49):

Yeah. Those three-week workshops were very cool, actually. And pretty intense. I mean, I wish we could still do the three-weeks from everything I hear, you know, two week and a one week online. And that kind of stuff doesn't quite match the level of involvement that you had at with those three week workshops back in the day.

Chance Hoellwarth (03:10):

But it was a lot. It's just a lot of time. Like yeah, ideally that's the way to go, but it's just like, like I even, we see it in our two weeks, right? There's only eight weeks in the summer and so like two weeks is a big fraction to give up to a PD, especially if you have to go and travel to do it, right? And so I think it's, it's incumbent on us to sort of figure out ways that we can kind of break it up, support people along the way, which I think the AMTA is doing. They have

this workshop that they're doing this summer that's gonna be for people, you know, that went to all the workshops and can kind of get 'em in while they're getting started in the fall. And so I think those are the kinds of things that we have to do and bring people back. And we've done that here at Cal Poly a little bit. Hey, here, you come to week A this year, come to week B next year. It's not ideal. You're gonna go out, you're gonna try it, you're gonna do things. But maybe that's a plus in the long run.

Mark Royce (04:01):

That's, it is some innovative thinking that's going on with AMTA and people like you that to help people deal with that issue of the time commitment. You know? 'cause it is a lot. You're right. So I'm curious to know how your involvement with modeling over these last 15 years or so, how has that influenced your thoughts on teaching science?

Chance Hoellwarth (04:27):

Yeah, I mean, I think I'd been looking for this before this kind of something like, how do you teach science, do having students do science? And so when I saw this, I was just impressed, you know, just how it all fit together and really even some of the supporting pieces, like how much they paid attention to language and about graphs and really thinking about let's use slopes and not talk about this graph goes up, right? Because the graph really isn't going anywhere. It's the slope of the data is positive or negative or those sorts of things. And so I think that's sort of what I kind of came into that, found that. So how has that impacted me? I've tried to do modeling at college, right? When I was teaching a lot, I tried to kind of, there was still room for growth in there in the sense of trying to make it match a sort of like every other day kind of a experience as opposed to like in high school where you're there sort of every day.

Chance Hoellwarth (05:23):

I'm sure people have done that on block scheduling. But back in the day it was like, hold on, I have to think about this a little more. Then I sort of ended up in administration, more running a credential program. And so then it kind of infected sort of how I thought about, Hey, this is just a great support for teachers Right. And new teachers. Right. It wouldn't it be great if we could sort of have people see this kind of opportunity, you know, right when they're getting started. I mean, I thought it would've been an amazing experience for me. And then just all the resources that exist for these teachers. You know, like you don't have to follow everything, but just having something to start with is just so valuable so that you're not just like constantly trying to make another worksheet or another thing or different things just to kind of have the information that your students are gonna need. It's so much easier to edit than to pull from scratch.

Mark Royce (06:17):

Yeah. So you're in charge. Am I correct in this that you're in charge of what's called CESAME at Cal Poly? Tell us briefly a little bit about what that is.

Chance Hoellwarth (06:29):

So it's the Center for Engineering Science and Math Education or CESAME as we like to call it. And we are really about recruiting more science and math teachers and supporting existing science and math teachers. So we have a pretty strong K 12 focus that we try and do a lot of activities getting college students into K 12 classrooms so they can see what that's about. 'cause we sort of feel, you know, experiences change lives. And so if we can give people experiences in K 12 classrooms, some of those people are gonna decide this is what they want to do. And so that's a lot of what we do. And then we do these sort of professional developments. I try and connect with physics teachers in particular. So, but trying to connect with K 12 teachers and really build a community that they can share ideas and find support for each other.

Chance Hoellwarth (07:17):

I mean, especially for physics teachers where they're typically the only one at a school. But ideally, I'm trying to find the basic core thing. Like what's valuable, what's useful for K 12 teachers to come together and then move into chemistry and math and biology and do all those sorts of things. Somewhere just to help make them better, and make them connect and share all these great ideas that people have, I think. But also, I mean, being selfish, I have a much more, teacher preparation mindset now, can we start to prepare, cooperating teachers for the future, where we can have their classrooms, where we can place our candidates so that they can learn sort of modeling techniques and that sort of thing.

Mark Royce (08:00):

Yeah. How long have you been coordinating with CESAME?

Chance Hoellwarth (08:06):

It's been about 15 years. 14, 15 years.

Mark Royce (08:10):

Okay. What motivated you to bring in modeling instruction to the summer workshops?

Chance Hoellwarth (08:17):

I mean, I think it was sort of this like, Hey, how do I build connections with local teachers? What can I give them of value? And I saw this as having a lot of value, as a way to meet the next Generation Science standards, as a way to sort of what I think is the most exciting part of learning science is doing science and really thinking about that kind of a thing. And so I think it's was was a way to kind of connect with them, what can I offer them? How can we help them, you know, meet the next generation science standards and be able to do more experiments or use experiments, say in a more coherent, constructive manner.

Mark Royce (09:01):

Because of my wife working over there on the summer workshops with you, I'm familiar with this thing called Noyce. A program called Noyce. Can you tell us about the Noyce program? And, and they have Noyce scholars, people that you know, students that they are funding. And so talk to me about how that ties in with the modeling instruction workshops.

Chance Hoellwarth (09:27):

Well, so the day-to-day of trying to offer a workshop in the summer, right? I mean, really, I've been trying to make it self-sustaining. Hey, how can I, people pay just enough that they're still willing to come, but I can pay all the instructors and do all of that. And so, at the beginning, I had some money to try and, okay, well let's get this thing going and we don't have to break even necessarily, but let's try and offer these workshops. Well, somewhere along the way, I used to co-direct with John Keller, at CESAME, and he was like, Hey, you know, Noyce is supporting this other program we had and they wanna do PD and they could do it around modeling. So he was really the person to bring modeling as a PD opportunity for Noyce Scholars.

Chance Hoellwarth (10:12):

And so, the Noyce program, like all these different universities have Noyce programs, and the goal is to recruit more STEM teachers. But they also have a Western regional organization. And so that's who I work with. And so they subcontract with me and they give me some money to offer these workshops to Noyce scholars. So these are all people that are all at these, all over the western states, Texas, Colorado, Wyoming, wherever they are. And they can come here and they, and Noyce will support their travel here, give them a stipend and support their room and board while they're here.

Mark Royce (10:50):

Oh, that's great.

Chance Hoellwarth (10:51):

And so it's really, it's awesome for them. We get great students coming here. I mean, and younger students, which I think, people earlier in their career, which is exciting. It's just cool to mix all those groups together. So you have people that have lots of experience, some that have lots of ideas, but they're all kind of learning this sort of modeling lens that I think is really exciting.

Mark Royce (11:13):

Yeah, that is. So what kind of feedback are you getting from the participants in the workshops? Noyce or otherwise? I know you have other teachers that find out through AMTA or other ways they find out about the workshops. What kind of feedback are you getting from your participants?

Chance Hoellwarth (11:34):

I mean, all the feedback that I get is really positive, right? I mean, so I'm talking to people mostly as they walk out of the door after these workshops. And so, I think it's amazing, right? 'cause you just go, Hey, it just, this idea builds on itself. You can see how it starts to make sense and you can see how it can make sense to students. So I think that's what I sort of get the sense of that they're telling me like, Hey, this is really great. Now, are there a few hurdles that you have to do to go implement back at your thing? I haven't heard as much about that. I mean, just looking at our local teachers who have done this like 10 years, you know, they've definitely, I don't know that there's a lot of 'em that are like modelers per se, right? Like that they're following the whole thing. But they bring the elements of this in there all the time. And they all say this has been an amazing experience. That's, you know, sort of has transformed the way that I teach.

Mark Royce (12:26):

When you say local teachers, you're in San Luis Obispo, which is not a huge community. I mean, it's a good size, but when you say local, what do you mean?

Chance Hoellwarth (12:39):

That's what I mean. San Luis Obispo County, Northern Santa Barbara County. So we're talking about maybe, I mean maybe tops 12 high schools kind of in that sort of a region. I don't know what the population, a couple hundred thousand, in this county and a couple hundred thousand in northern Santa Barbara County. But sort of spread over a pretty wide area.

Mark Royce (13:02):

Yeah. There's a lot of little towns all around the San Luis area. SLO as they call it. Slow. Exactly. Cool. Yeah. So, what if someone is thinking about hosting workshops, I mean, not everyone's at a university like you are, but if someone's thinking about hosting, what advice or encouragement would you give to someone like that?

Chance Hoellwarth (13:31):

I mean, I think you have to sort of take stock of where you're at, right? I mean, if you're in a university right? Then there's gonna be some resources. Like, it's definitely an advantage that I can go talk to the physics tech and the chemistry tech and the bio tech and they can pull things together. We've kind of, but since the pandemic, we've kind of been increasing our numbers every year, which is, is good. 'cause I think, you know, right after, right during, I mean there was a lot of online stuff, but not a lot of people coming here. So I guess, what do you, what would you wanna think about? I mean, I guess the first question is what are you gonna offer? Like, we get to offer physics, chemistry, and biology and there's a certain advantage 'cause you can kind of pull different people. And we've had a

couple schools send like their biology, physics, and chemistry teacher, which is super cool. Yeah. And so, that can be an advantage, but then it costs more, right? Like, so you gotta make sure that you have the funds to sort of pay the instructors.

Chance Hoellwarth (14:31):

You know, people and trying to map out that difference. Or what are the intakes and the outtakes, so to speak.

Mark Royce (14:40):

You're fortunate in that you have the facility to do these workshops, you know, the classrooms that are equipped and can host these two week process things. And so is there any advice that you'd want to give to anyone else who's trying to do that? About considering managing, you know, the resources there?

Chance Hoellwarth (15:03):

Yeah, I mean, I've had the most success when I've had someone that can kind of definitely help out part-time and kind of handle some of these logistics. I guess some of it's how much do you wanna take on, right? Because of the Noyce scholars, we make sure, and we're on a university, we can use the dorm, right? So then they can handle a lot of that. It's about half the cost as if you go get hotels. Which if we've done in the past as well. And so there's sort of that, trying to make it viable for people. It turns out if the hotel is 250 bucks and we're 130 bucks, then that's -- a night. Then that makes a big difference over a two week period.

Mark Royce (15:40):

Yeah.

Chance Hoellwarth (15:41):

So there's some of those logistics, like where are people gonna stay and how much are you going to, interact with them when they're doing that. Then there's sort of getting the instructors and getting 'em so that they can come and know the time and picking your time so that you can have them, you can advertise early enough. 'cause you gotta, like, well, we just locked down our times for next year. I'm like, why? Why am I waiting? I just need to know when you all are available so we can get this on the books.

Mark Royce (16:09):

Yeah.

Chance Hoellwarth (16:09):

And then there's just sort of logistics of what people need. Right. Which is gonna depend, like if you're at a high school, you could have a lot of stuff in there already. But then you gotta be able to use that, from all the different departments. But those are the big things. Like where are people gonna stay, where are you gonna do it? And what access to equipment do you have? And then, you know, you gotta buy some of the miscellaneous things.

Mark Royce (16:35):

Yeah. Okay. Cal Poly is hosting these things. I know ASU hosts the workshops and I don't know how many other universities around the country are, but what would you say to someone at university that would encourage them to host workshops? What's the benefit to the university? I know the benefit to the general teaching, you know, in, in America has benefited, you know, but what would you say to a university to encourage them to become a host?

Chance Hoellwarth (17:13):

I think it's, for me, it's a resource that, because I open it up to a bigger pool, it's a resource that the local community

can kind of come, the K 12 community, right. Where I couldn't offer it to my 10 local teachers or my four local teachers that have time to do it in any particular year. But if I can get up and get, you know, 40 or 50 people coming from around the country, then that's a different story. Right? But the people in our area can then participate and then that's an opportunity for me to connect with them and an opportunity for the school of, or the college of education to connect with them, right? With this idea of, Hey, if these people are out there and they're doing this great modeling stuff, maybe they would be, good cooperating teachers.

Chance Hoellwarth (17:59):

I mean, there's a lot of things that go into that, but trying to build those relationships and just understanding what's going on locally. It also opens doors for other things. 'cause like we're trying to do early field experiences to try and recruit people into teaching. Well then if we have connections to classrooms, then that's places where our students can go and they can tutor and they can help and they can do those sorts of things. So it's about, I think, building up your connections to your local community and sort of using the bigger national thing to kind of make that possible.

Mark Royce (18:30):

<affirmative>. That's good. What would you say to teachers? It's hard for them to carve out the time that you spoke about to come to a workshop. It's also, you know, their summertime, they're giving up family and other obligations. And what would you say that would help encourage people to come to your workshop and, you know, help express the value of the workshop to potential participants?

Chance Hoellwarth (19:03):

Yeah, I think the value, I mean, experience changes your life, right? So in this experience gives you an opportunity to learn something new, right? In a new way, but also learn it with other people that have a different perspective and a different situation. So I think just the amount of like, oh, I got new ideas, but I got also eight different people's takes on those ideas that have, in some cases, the same kind of situations, in some cases, different situations. And so I think there's just a powerful, for this to really just change the way that you do things. Now if you're not looking to change the way, then you do things, then that may not be that compelling. But I mean, I think in the sense that we're all in this learning organization, we're trying to figure out what's gonna connect with students.

Chance Hoellwarth (19:49):

I feel like at the heart here is there's a lot of things that can connect with students, right? It can really get 'em involved in doing science. And that just seems like that's a real benefit. You know, even if you don't take it on all parts of it. Like just even building aspects of it would be great. Like, we had a local, project-based learning high school. And so when I was the coordinator of the credential program, we built a partnership. I'm like, Cal Poly, we're learn by doing. We need to have kids in a, you know, future teachers in a project based learning high school. So the superintendent is like, yeah, I've got this project based learning high school. He said, I'm not trying to make everybody a project based learning high school. I see this as a way that this is an experience maker.

Chance Hoellwarth (20:38):

So other people's, 'cause if every kid did one project each year, that would be amazing compared to doing no projects each year. As a way to connect with the content, connect to real life, that kind of thing. And I think modeling sort of the same sort of thing. Even if you don't take it all on, right? Like giving people, these kind more experiences where they take data, they analyze the data, they come up with a model, they change the model and get a sense as to like, hey, all models are wrong and some are useful. And like, how do we get to those useful parts and really be able to say something about the world? I think then that's super cool. And so I think that's why this is a cool experience.

Mark Royce (21:20):

Wow. Yes. That's, that's very good. And I think that's a great argument. So, why should potential participants come

to San Louis, to your workshops? As opposed to another one.

Chance Hoellwarth (21:39):

I mean, at the end of the day, 'cause time matters, I would say go to the workshop that's closest to you. I mean, that makes sense to me, right? Like, if you only got eight weeks in the summer, you don't need to spend all of it, going all over the world. On the other hand, you could come to San Luis Obispo, which is an amazing spot, which is at Cal Poly, which is an amazing university or whatever. And we're near the ocean. And so it's sort of, part vacation, part work. We've got great instructors. They've been doing it a very long time. And so, I think that's why you would wanna come here. I mean, I think some of those things maybe not, is not at all the sites, but, yeah. I mean, I think that's why,

Mark Royce (22:23):

Well, I've, I've had the opportunity to travel quite a bit, and I still believe the central coast of California, where you are right in the center of, is one of my favorite places to be in the world. And it's just so beautiful there in the summer. And so I always tag along with Brenda when she's over there to teach. So I would just throw that in too, you know.

Chance Hoellwarth (22:49):

Well, that's what I said, the weather and the ocean are right here. So that's reason enough, I suppose.

Mark Royce (22:55):

And the, the wonderful places around San Luis as well is like Morro Bay and Avila Beach, and you know, Hearst Castle is up there and all that stuff is just, it's really a cool place to be. So, I'm gonna kind of divert and ask you kind of a interesting thought here. AI is becoming very prevalent in our world. With the advent of AI and the way it's exploding onto the scene, what are your thoughts about it and how it might influence, from your perspective, the science classroom, and how would it impact in a modeling classroom specifically? Do you have thoughts on that?

Chance Hoellwarth (23:43):

I do. This is my current passion, trying to figure out, like, I was slow to kind of get the AI sort of, what the heck is AI? That's how I knew I was old. 'cause I was like, I don't need to know anything about that. But recently I've decided, oh, you know what? I need to learn something about this. Or I may not be relevant very long, but it's really open... What I'm really interested in is how can it put students in the position to do more science? And by do science, I mean like, have a question and answer that question. Because so much of that is sort of limited by what you know, so modeling's great. So you start, you know, we'll look at a buggy and we'll learn about constant velocity, then we'll roll something down a track and learn about acceleration.

Chance Hoellwarth (24:30):

And there's this whole process to it. And that has a certain dynamic that makes sense for a classroom. But one of my main point is like, I do a first year experience for physics majors at Cal Poly. How do I get them the kind of idea of the process? Like, Hey, you can do, you can ask an interesting question and get some results about something about your life. 'cause I think that's the thing that a lot of people are looking for is how does science connect me to the world? Right? Like, people can see how art and music, and they can kind of connect it in some obvious way, but science, sometimes we have to work a little harder or we've worked hard to make, do what it does, but then we lose our connection with what's sort of going on, you know, right now here and now. And so, like, the phones now have sensors, all kinds of sensors in them that can give you lots of data. But what do you do with that data? So, just as an example, we had some teachers on campus at the beginning, right when we started our modeling workshop. And we were looking at, Hey, how do you, how could you do AI? Well, you can take acceleration data. And so we put a phone on our hand and then you can sort of measure the tremors.

Chance Hoellwarth (25:45):

Well, the acceleration, like when you look at that graph, it's not very interesting. Like, it just looks like a lot of noise. But if you do a Fourier analysis of it, do a power spectrum, then you can start to see, oh, the characteristics, frequencies is something, right? But there's a lot of work to do that, a lot of calculus, a lot of things in there. But if you write the right prompt, the AI will do that. And give you the spectrum and give you the characteristic frequencies. And now you are in the position to do an experiment. Well, let's see, what if I count from a hundred or count, you know, to zero from a hundred by thirteens, you know, somewhere where I'm not, I have to think about something else. Or what if I meditate and measure my tremors?

Chance Hoellwarth (26:28):

Like what happens? And not that that's in the end, the most interesting question, but it's an interesting question in this moment at this particular time. And because AI exists, I could do a tool, should I learn about power spectrum? Should I learn about Fourier Transforms? Absolutely-- at the appropriate time. But there's no reason you couldn't use the tool now where before it was sort of, you have to do this and you have to put all this data in Excel and then Excel. You gotta use this function and then blah, blah, blah, and understand all those things where in AI, it can sort of just spit it out in one fell swoop. Now are you losing something? Probably, but are you gaining something in this moment? Like one of my colleagues, we always had this thing we're like, it's about the physics. How do we get to the physics more and not all the calculations we need to do to do the physics kind of thing.

Mark Royce (27:21):

Interesting. So it speeds up the process for one thing, right? Sure. Right. If you're not having to manually do the calculations and all that kind of stuff, do you feel like it might lean into cheating?

Chance Hoellwarth (27:37):

Well, I guess in this context, I don't, I don't know about like, just taking the data. I mean, I suppose it could, I mean, lots of things could, and does it get in the way? I think it's hard to think about. 'cause sometimes I'm like, okay, I want to be at the physics, but there's all these calculations that you have to do. And then if you're just an average, you're kinda like, oh yeah, I'm a junior high, high school student. You're like, how many steps do I have to do before I get pay dirt? It's like we all have a different level of that, right? And if your level's like two, but I need to make you go eight, like then everybody's gonna be miserable. Right? Where if I could get you into the exciting part, Hey, can I make a hypothesis?

Chance Hoellwarth (28:20):

Can I test that hypothesis? Could I say something interesting about the world? Or at least talk about to my parents about it or talk to my friends about it? Then I think that's pretty cool. Yes. Now that's as far as I've gotten, I think there could be way more potential, maybe, I don't know, but we just have to kind of mess around and, and see what it can do. Yeah. But it seems like there's some potential to do that now. Sure. If I open you up to AI, you know, could you do a lot of things with it. But I look, talking to my step kids, they're already doing a lot with it. Oh, sure. So I think I'm behind actually. <laugh>. Yeah,

Mark Royce (28:57):

<laugh>. I totally understand that. <laugh>. Yes. Wow. That's awesome. Jumping back to workshops at Cal Poly, do you feel the future is pretty solid moving forward? I know it's getting harder financially for people and the time thing we've mentioned. How do you forecast the future of modeling workshops, in your particular circumstance?

Chance Hoellwarth (29:27):

Yeah. Well, I'm thinking about this 'cause of looking forward, right? This Noyse, Western regional Noyse and their next iteration isn't gonna support pd. And so like that bit of money, that's definitely been a stabilizer and gets

people to come from a little further, frankly. 'cause it pays for their travel. Like that makes a big difference. And so I would think, when I look at the future locally, I really think about, Hey, how can I connect with schools, like maybe wherever my instructors are, maybe here locally, maybe going down to southern California, Northern and trying to get certain school sites to send all three of their teachers or three of their teachers, right? So, and then if it's kind of a school supported thing, then potentially they could find some resources, to kind of make it possible. So, I mean, I think that's a great model. And I think one we just have not like modeled or put any information about how much it costs and what are the benefits and all that sort of thing. So I think that's a goal for this year. I think the other thing is really trying. I mean, I have had superintendents talk to me about math

Mark Royce (30:43):

Mm-hmm <affirmative>.

Chance Hoellwarth (30:44):

Like they are really, how do I connect math to the real world? And so it's definitely made me think like, Hey, is there a way to use all the best of modeling kinds of experiments and others that are, problems that are connected to life and put 'em in a math classroom. Not as a way to rechange how you're gonna teach math or whatever, but as a way to bring in one thing where you're gonna take some data or analyze some data or solve a problem about motion or whatever, but it makes the math connected to life. And so I'm gonna develop some of that kind of curriculum. I'm working with someone to do some of that and then really offer those kind of workshops. And potentially if you can get the math teachers to come in and going, Hey, this is really cool, this really works. And we're not trying to change their life in the way that sort of modeling is trying to change your teaching life, but just like infusing these things in, if students get excited about that, then I think that could also be a word of mouth getting teachers to come check it out. Yeah. You know, and then the, maybe even then the school is more likely they could send a math and a science and all that to the workshops.

Mark Royce (31:51):

Yeah. You know, having a school department, like the science department, and I think math and science are just inextricably connected in education. More than they have been probably, traditionally. But if you can get an entire department to be in line, and I would just say with modeling instruction, it builds through the different disciplines and through the different years for the students. And, I've often thought that it would be awesome. The schools that do have departments that are unified with modeling are some of the strongest.

Chance Hoellwarth (32:32):

Well, I think people can see the interconnections in different ways. 'Cause we don't, sometimes it's mass. Right? Even the workshops that are here, they get together and they get all the teachers together to talk about energy as viewed from all these different disciplines. Right. And it's different. It's, it's part of all of them, but how they talk about it is different. It's different. So I mean, I think to your point, definitely, you know, there's a way to kind of connect and have people see how they're all sort of related.

Mark Royce (33:00):

Yeah. Yeah. That's awesome. Well, Chance, it's been really, really awesome talking with you, uh, about these things. And I think you have such a unique perspective from your position. And I'm really, I mean, personally, I think it's awesome that right here in California, central California, we've got such a strong support for the workshops, for the AMTA workshops, and for modeling instruction and such a great opportunity for people to get there and learn. Thank you for taking the time outta your busy schedule to spend a little time with me and talk about these things. I think our listeners are gonna really enjoy hearing your perspectives. And I just wanna wish you the very best and continued success in the program with CESAME and, and all the things you're doing over there at Cal Poly. It's just awesome. So thank you for being here today.

Chance Hoellwarth (34:01):

Well, thank you for having me. It's been great to share my experience with you and look forward to doing it again in the future.

Mark Royce (34:07):

Yeah. We'll touch bases again in the future. That's great. Okay, man. Okay. So I'll see you. Okay.