

Mark Royce ([00:00](#)):

Hi, Kelly. How are you?

Kelli Warble ([00:03](#)):

I'm great. It's so nice to be able to speak with you in person, Mark, after being such a longtime listener.

Mark Royce ([00:09](#)):

Oh, good. That's fun. I'm really excited to talk with you as well. With the bit of research that I've done about you. You're a very busy person, and you're very involved with promoting education and good pedagogy and choices in the classroom, and I'm excited for you to be able to share with our listeners some of the things that you've learned and discovered over the years. I was surprised to see that you've been involved with modeling almost from the beginning of your career, even in your education. Is that correct?

Kelli Warble ([00:48](#)):

Yes, it's true. And even as a pre-service teacher, my methods of teaching physics course was modeling instruction pedagogy, taught by Larry Dukerich, way back in 1992 or so. And prior to that, I actually was in a high school physics classroom in Mesa, Arizona in the late eighties that was taught by Rex Rice. Rex Rice at the time, was taking courses at Arizona State University, and speaking with Malcolm Wells, who's really the first teacher who did modeling instruction. So, in a way, I almost consider my high school classroom, way back in the 1980s as having been of a modeler or a future modeler. So, since high school, I would say.

Mark Royce ([01:42](#)):

Yeah. You don't look old enough to have been teaching for that long, you know, almost 30 years.

Kelli Warble ([01:49](#)):

Well, thank you. I have been teaching that long.

Mark Royce ([01:54](#)):

Yeah. So, did you ever meet Dr. Hestenes when you were back in those times in the nineties?

Kelli Warble ([02:01](#)):

Oh yeah, absolutely. After taking the course in 1992 as a pre-service teacher, I got to be part of the grant that started in 1995. That was by David Hestenes to bring in physics teachers from across the country to Arizona State University. So he was frequently in the room for the grant programs that we had. So yes, I did meet him a lot. And currently I now work at Arizona State University as the physics teacher in residence. And my office is attached to David Hestenes' office, which is still there, although he is not usually on campus. So he's a professor emeritus there. So, yes, I'm very close proximity. He and Jane Jackson and really Larry Dukerich have been kind of a fixture at Arizona State and in my career.

Mark Royce ([03:06](#)):

Yeah. So you've been involved in it since the roots of modeling instruction and the development of it. And the expansion of it. So that's really, really fascinating. I, you know, I did interview Dr. Hestenes and

I've interviewed Larry Dukerich and Jane, and you know, so I've gotten a bit of the history from them. Yeah. But you were there, you were a part of it. That's awesome.

Kelli Warble ([03:32](#)):

Yeah. I think I consider myself lucky to have been part of that cohort of teachers and just because I started my teaching career with a really strong support network of fellow teachers who were working to make the pedagogy in their classrooms really student-centered and be effective for our students. It made me feel very empowered as a young teacher, too. Not a lot of young teachers got to do something like that at that time.

Mark Royce ([04:03](#)):

I saw that you started as a mathematics teacher. Is that correct, in your teaching career?

Kelli Warble ([04:12](#)):

Yes, actually, my first year teaching, I taught only mathematics, but my certification was always in mathematics and physics. So then my second year teaching over the summer, they sent me to phase one of the modeling instruction workshops at Arizona State. And then I took over the physics class the next year also. But I was at a very small school, so there was only two sections of physics. So my other three sections were, were mathematics.

Mark Royce ([04:43](#)):

And you're still involved with math stuff?

Kelli Warble ([04:47](#)):

Yeah. I became teacher in residence in the physics department at ASU in 2012, but I really did miss my math teaching cuz I always taught math throughout my 18 years in high school. And I'm really excited that this year, we've got some funding from the Arizona STEM Acceleration Project to develop a few modeling workshops. And one of the ones that we're working on is a modeling workshop in middle school mathematics. So I am helping with that project right now, and we will be leading our first workshops this June, 2023 in Mesa, Arizona. So I'm super excited to be back with math.

Mark Royce ([05:29](#)):

Is this the first time that middle school math has been brought into the modeling world?

Kelli Warble ([05:36](#)):

Yes, it is. I imagine, like me, I was always trying to put modeling instruction pedagogy into my high school math classrooms. But there was never an official workshop. But I imagine, like me, many of our middle school science teachers, that also teach math, have tried to use the pedagogy in their mathematics courses. But this is the first official modeling workshop for middle school math. That's exciting. So very much pilot. Yes. We're, we're very excited about the project.

Mark Royce ([06:07](#)):

Yeah. My wife has spoken to me about-- she's high school nine through 12 -- and she has spoken to me about how the kids aren't always ready for modeling when they come in to high school from middle school. And so it's exciting to hear that you guys are doing that middle school workshop.

Kelli Warble ([06:30](#)):

Yeah, I definitely agree. And I do think that, I think research shows that we often lose our kids, our students in their interest in STEM fields in middle school. So, amazing middle school teachers can make all the difference. And I was lucky to work on the middle school modeling science, uh, curriculum as well. And, true to the tradition of modeling instruction, took what the middle school veteran teachers knew about how teaching and learning of their students went and took their advice, to make sure it was appropriate for middle school. I learned so much from the middle school teachers, and they're absolutely phenomenal. And I just feel as if they're such a benefit to our community. I wish we had more, could, could serve them better and have them more active in the modeling instruction community, middle school teachers across the board.

Mark Royce ([07:31](#)):

Yeah. That's Well, more power to you and your tribe about promoting that. You know, that the middle school teachers are more involved. So you've been really involved in a lot of things. A couple that I wanted to talk to you about is, I saw that you were involved with the AAPT and AIP, which I don't know what that one is, the American Association of Physics Teachers. I know, but the AIP I don't know, master Teacher Policy Fellowship. Can you tell us about that and your involvement with that organization?

Kelli Warble ([08:11](#)):

Yes, absolutely. So the American Association of Physics Teachers is AAPT, as you mentioned, and AIP actually stands for the American Institute of Physics. And, I was on a task force to write a report called *Aspiring to Lead* about how to make physics teachers sort of agents of change in high school physics education, but also broader STEM education. And part of that was that maybe teachers need more say in some of our policies and in advocating for strong STEM education policies, but teachers aren't necessarily listened to in the policy arena. And many initiatives would really be well informed by the teacher voice, to avoid some pitfalls that occur. So the AAPT, she was the program officer for high school, the K-12 program Officer-- Rebecca Vierra, secured a grant to have a small cohort of teachers come to Washington, DC for a 10 day sort of workshop, bootcamp, whatever you wanna call it, in policy and policy advocacy. And her grant was funded both by AAPT and AIP. So it was Rebecca Vierra who did it. And, I got to be involved in that because at the time I was doing a master's degree in science and Technology policy. So this became my applied project.

Mark Royce ([09:56](#)):

So. Awesome. And, and was this focused at the state level with Arizona or more of a national focus?

Kelli Warble ([10:05](#)):

So the idea was that really, when you're advocating for education policy, the key place to go is your state because about 90% of all funding for your typical public school comes from state funding, federal funding isn't really that important or as key. So the idea was if we bring teachers from different states as teams to Washington, DC and have them do the rounds at the federal level and go to Capitol Hill and talk to their congressmen, but then also go to the department of Education, to the National Science Foundation, to a lot of the education associations that are housed in Washington, DC that if they went to those places and learned from those venues, they would be more apt to go back to their home state and advocate at the state level for policies that were going to help STEM education and their students.

Kelli Warble ([11:11](#)):

Because it seems much less intimidating to go back to your state level and make advocacy after you've done the federal rounds. So there were teams from, I think, five different states in the first cohort, and Arizona was one of the states, and that's my home state. And we actually used Arizona sort of as a case study in how to do this because at the time, a few people who are from modeling instruction had started to go to the state and advocate for funds for teachers to take classes to become highly qualified in physics or chemistry or mathematics. And the reason we advocated for that was so that people could take modeling instruction workshops at Arizona State University during the summers and be paid for it so that they could go back and be more effective teachers.

Kelli Warble ([12:07](#)):

So, Mike Vargas and Larry Dukerich and Jane Jackson, and Al Bartlet, Earl Barrett, that was his name, they had been advocating to our state and had already gotten some legislation passed for STEM scholarships for teachers. So Mike Vargas came to the original DC policy fellowship to sort of be a coach and mentor. And we also had another, a group of Arizona teachers there for Arizona on our behalf too. And their idea was that they were gonna go back to the state legislature and advocate for more scholarship funds so that teachers could take this high quality professional development. So in our case, it worked very well because our team came back to Arizona and got more funding.

Mark Royce ([12:58](#)):

So is that a continuing thing? Is it, you know,

Kelli Warble ([13:02](#)):

The policy fellowship? Yeah. The policy fellowship itself unfortunately only had a two-year term, and then the grant ran out and it has not been renewed. However, the Arizona team, we called ourselves the Cactus Caucus because we were from Arizona. The Cactus Caucus is still very active. And so we speak with each other frequently about Arizona STEM education policy. And two members of the Cactus Caucus, Mike Vargas, who I mentioned before, and Amanda Whitehurst, who had been an elementary science teacher, they recently wrote a grant at the Arizona State level to get recovery funds to fund professional development for STEM teachers. And did get a 10 million dollars in recovery funds to do that. And that's now called the Arizona Stem Acceleration Project. And that project is what is funding this middle school math workshop that I am currently developing. It's from those funds.

Mark Royce ([14:12](#)):

So that workshop, when are you gonna be offering it?

Kelli Warble ([14:17](#)):

So we decided we are working on four different units for middle school math. That's what's funded. And we decided to give the workshops in increments of one week. Each week will be one of the units. This summer we're only gonna do two of the units in June. So they're gonna be week-long bites of the middle school math in June, starting June 5th the first week. And then there's a middle week where we're going to be doing connecting middle school science and mathematics. And then the third week will be another workshop. So, they're in mini increments this summer.

Mark Royce ([14:58](#)):

Interesting. And these are face-to-face workshops, not online, or are they both?

Kelli Warble ([15:03](#)):

Yes, they're face-to-face workshops. We wanted the initial workshops to definitely be face-to-face. It is going to be like any modeling workshop where we have lots of manipulatives and hands-on ideas for understanding things like ratios and proportional reasoning. So we wanted it in-person and we'll see how it goes, you know, if this is something that's feasible to make a remote workshop in the future. But for the pilot workshops, we are in person in Arizona.

Mark Royce ([15:36](#)):

Yeah. Right, is it gonna be at ASU?

Kelli Warble ([15:40](#)):

No, we actually decided to partner with a local school district. So it's gonna be in Mesa Unified School District on the campus of Carson Junior High. And that actually is kind of more convenient because when we have workshops at ASU, just parking and walking to the class, is such a pain. So this will be much better. They are all being sort of hosted so that we've left 10 seats available for Mesa teachers in that district, and then 16 seats available for anyone else who wants to join. And those are being sort of hosted by STEM Teachers Phoenix. So, if anybody wants to register, it's on STEM Teachers Phoenix website. Anybody can register. And we will be hosting some math workshops in parallel with some science and an engineering workshop on Mesa campus. All going on at the same time.

Mark Royce ([16:42](#)):

Are those workshops promoted on the American Modeling Teachers Association AMTA site?

Kelli Warble ([16:49](#)):

I believe so. I believe Kaylene just, she was getting information about them to put them on the site. So I believe they are. And they are definitely on STEM Teachers Phoenix, which is sort of an offshoot of AMTA. So

Mark Royce ([17:04](#)):

Stem teachers phoenix.com or org or?

Kelli Warble ([17:09](#)):

.org Yeah. Yeah. STEM teachers phx.org.

Mark Royce ([17:13](#)):

Ah, okay. Good. So somebody listening is interested or knows a middle school teacher that would benefit from this, it would be great for them to know where to go.

Kelli Warble ([17:22](#)):

Yeah. We would be thrilled to have any teachers.

Mark Royce ([17:26](#)):

There's another thing I wanted to ask you about. It's called the Step Up Initiative. And I, you know, I had never heard of that before, but that doesn't mean anything cuz I'm not in the middle of your, the science world. But tell us about Step Up and what that is and in your involvement there.

Kelli Warble ([17:44](#)):

Okay. So Step Up was also funded by the American Association of Physics teachers. And so when I did my internship for my master's degree with them in Science and Technology Policy, I helped with that program and Step Up itself, the acronym stands for, I think, supporting teachers to encourage the pursuit of undergraduate physics for women. Um, the acronym isn't as important now as the idea. Basically they had a grant to develop lessons for high school teachers to give in their high school classrooms that were shown to improve the odds of that student going on to pursue a degree in physics. The reason for this was that in physics right now, in the United States, about 20% of the bachelor's degrees only are awarded to women. So there is a real gender inequity or difference in who's pursuing physics.

Kelli Warble ([18:53](#)):

And that is much lower than getting degrees in biology or chemistry. Those are really close to 50/50 as far as men and women. So we know that there's a problem in physics. There's a problem in having underrepresented groups pursue physics. So these lessons were designed to address that specifically for women. But I think there is some consensus that the lessons also help other underrepresented groups or tend to support them to consider physics as well. The first lesson developed is called a Careers in Physics lesson. And it's really kind of cool because it's sort of like a match.com sort of thing for your students where they take a survey of their values and also the content areas they're really interested in. And they get matched to someone who has a physics degree who has similar profile to them on their brief survey.

Kelli Warble ([19:51](#)):

And then they do some research into the kinds of careers they can have with physics. And the career profiles are very interesting. They have a big cross sections of people and they'll have everything from like a YouTube video to, you know, a research lab physics person. And students sort of make their own career profile and envision themselves as physicists. And the lessons ...because I'm with American Modeling Teachers Association, I got to go to some of the workshops in Arizona State University the first summer prior to Step Up being launched and share the lessons with modeling teachers. And the result is that the AMTA community has become very involved in this whole project. And have even started playing with things like, well, could I make these careers lessons similar, but use chemistry people or life sciences people or mathematicians or, so AMTA has really embraced the project. And so then, a lot of the Step Up teacher ambassadors are actually also AMTA members and leaders. So it's very very exciting.

Mark Royce ([21:10](#)):

That's very cool.

Kelli Warble ([21:11](#)):

Yeah, so that initiative's great. And they also have another more challenging lesson about how women are underrepresented in physics. And it encourages students to share times when they felt like they didn't belong in a class or a situation and why, and have the hard discussions of belonging. And that's

the second lesson in the Step Up materials. And it's very effective lesson with a good conversation about unconscious bias and how we all have times when we feel we don't belong and goes towards encouraging students to pursue these fields where maybe the sense of belonging isn't as high. So that's also very much aligned with modeling instruction. And along with it has the guidelines for discussions during these difficult conversations. They created a poster out of it. And those guidelines will end up in modeling instruction classrooms a lot because the guidelines for discussion poster became really popular.

Mark Royce ([22:26](#)):

That leads to, I was very interested to ask you about this. I saw, in a little bit of your bio and some of the other things online, I found you're very involved in initiatives that focus on diversity and inclusion and, you know, the Step Up is one thing, but talk to me a about your involvement with promoting diversity and inclusion in the classroom as well as wherever else you're working toward that.

Kelli Warble ([22:57](#)):

Yeah. I did get involved in that, I think because I left high school to work at the university, and there are a lot of initiatives at the university level focused, especially on STEM subjects, about how do we get a representation in our classes that looks like the same demographic as our local communities. So I kind of jumped at the chance to get involved in these initiatives when I could. And then, I think that honestly, I have to give credit to AMTA teachers during their leadership during the Pandemic. I would like to say specifically, Tanea Hibler, Ariel Serkin, and Teresa Marks, who actually hosted some really interesting and valuable equity listening hours during the pandemic around the time of the George Floyd incident. They had us come together for very difficult conversations, and they actually served as my, sort of my guiding star for trying to advocate for similar things in my community. I don't know that I'm nearly as effective as they are, but they really have been an inspiration to me. So when I had the opportunity to join, sort of like the diversity and equity teams at Arizona State University, I tried to take what I learned from them and advocate for the same things that they kind of helped me think about and advocate for. So, again, AMTA has been a lead in that, I think.

Mark Royce ([24:46](#)):

I did an interview with Tanea and Ariel. It's been a while. It was like a year ago or or so that was really good where they talked about these issues. That was really quite excellent. Yeah. That's great. You shared with me that you're really excited about the Arizona STEM Acceleration project.

Kelli Warble ([25:09](#)):

Yes.

Mark Royce ([25:10](#)):

Tell us about that. I know that's a current thing that you're involved with and share with us about that.

Kelli Warble ([25:18](#)):

So that is the project that is the \$10 million in funding secured by the policy fellows, Mike Vargas and Amanda Whitehurst. They secured that funding for the state of Arizona to support professional development. And they're using that to develop new modeling workshops, which is really excellent. And I honestly just wanna call out the fact that this was an AAPT fellowship with lots of people from across the country. And the teachers from Arizona were all involved because of modeling instruction. We got

connected because of modeling instruction, and they came back and have just been phenomenally effective in advocating for ways to help teachers improve their practice that are meaningful to the actual classroom. So I think it's amazing and I think it speaks to how the modeling community sort of makes teachers feel empowered.

Kelli Warble ([26:29](#)):

I think we really empower teachers so that we can empower our students and in meaningful ways. And I think it's overlooked how impactful it can be even outside of just, you know, modeling instruction workshops. Yeah. And I'd also like to mention two other teachers, or three other teachers that are involved in that project, which is Nicole Spencer, who is a middle school science teacher, and Jeff Hengesbach, who's a community college physics teacher. And Melissa Germscheid, who is a high school physics teacher who leads also computational modeling in physics first. So these were all the policy fellows from Arizona, that are all modelers and have come back and really advocated for policies that help improve STEM education in our home state.

Mark Royce ([27:24](#)):

You know, it's really exciting for me to hear about the connection that you guys are making between the AAPT and the AMTA, the American Modelers and the Association of Physics Teachers. You know, cause they're two great organizations and it's really exciting for me to hear that there's cross pollination happening and a receptive collaborative attitude. That's really, really neat to hear.

Kelli Warble ([27:56](#)):

Yeah.

Mark Royce ([27:57](#)):

I wanna ask you. I sent you a little survey before our time together to get some information from you. And one of the questions I always ask is before we do the interview is, can you share your best teaching or modeling tip with us? And you responded with the most complete description of things that you've learned over the years that are wonderful at tips. And I don't know if you can just pull 'em outta your memory from what you wrote to me, but can you share those, some of those tips with us, with our listeners? Because they're great, they're really good.

Kelli Warble ([28:40](#)):

Yeah. It's hard to know whether these little tips are helpful or not. So I was just trying to think of the ones that seem to come to my mind often when I'm discussing things in workshops with teachers. And one of them is something my mother said to me once, when she had left town and my high school-aged sister decided to pierce her own belly button. And my mother came back and Kendra had, my sister had, she was bleeding through her shirt, at her belly button. And I kind of felt bad cuz I was in college at the time, but was partly, uh, living at the house with Kendra trying to help her out. And my mother said, you know, I've learned that you have to give kids freedom, but not more freedom than they can handle.

Kelli Warble ([29:30](#)):

And I've discovered that that's kind of the true also in modeling instruction insofar as we wanna leave things open-ended and have students discover and build models on their own. However, if we just completely take off the training wheels, the students themselves can get kind of overwhelmed, I think, and sometimes derailed because they just don't have enough focus to know exactly where to even start.



And that can be as bad as being too directed and telling them what to do. So I think that it's a constant balance between how much or how much you're open-ended with your questioning, but giving enough focus so that the students aren't overwhelmed. So give them freedom, but not more, more freedom than they could handle. So they're not overwhelmed. And I think that balance is one of the most difficult things in teaching, is knowing how to make that balance, to not be super directed because then you might shut down any creative thought, but to have enough structure that students can engage with it without being intimidated or overwhelmed by their amount of choices. So that was one bit of advice that I think comes up a lot, in a different context. But I think it's applicable.

Mark Royce ([30:58](#)):

I think it's important cuz it's not like a tip that teachers may not have some sense of already, but it reinforces a very important thing in the classroom. You know? Do you wanna share any of the others or do you need me to read 'em to you? <laugh>?

Kelli Warble ([31:16](#)):

Um, I think probably the second thing I put on there, which I think back to a lot is kind of a harsh statement, that is shut up and listen to your students, which we don't really wanna tell people to shut up nowadays, but it was one of the first things that Larry Dukerich probably said to us in our workshop in way back in 1992. And that is that, you know, at the time it was very teacher-centered. You know, you're supposed to lecture about physics or math or whatever to your students and be this great orator. And his point was if you are quiet and let your students talk and speak, you'll hear what they're saying and you'll understand where they're hitting difficulties. And I actually think that this kind of goes to, I think your wife actually had a column, Brenda, about probing, questioning their answers, you know, questioning students' answers and always probing their thinking. And not trying to put your own words over what they're saying. Because sometimes you're surprised by the turn it takes what you think is their misconception or their preconception is not actually the case and they're thinking something different. So you really have to carefully listen to your students, and not try to overlay your concept of what they're doing on them.

Kelli Warble ([32:52](#)):

But I still think shut up and listen to your students often to my own self. When I find myself not doing that in the classroom.

Mark Royce ([33:02](#)):

Well, that's a very Larry way to say it too.

Kelli Warble ([33:04](#)):

Yeah, it is. It is.

Mark Royce ([33:07](#)):

Yeah. It's really cool. Okay. You gave me three other tips. Do you remember?

Kelli Warble ([33:14](#)):

No, I don't necessarily remember. Maybe you should choose your favorite.

Mark Royce (33:18):

Well one was, I want you to share 'em all cause they're really good. But you talked about whiteboarding sessions.

Kelli Warble (33:26):

Oh yeah.

Mark Royce (33:27):

Do you remember what you said about that?

Kelli Warble (33:29):

Yeah. I think when we first started with modeling instruction, when we did whiteboarding session, it was really in one format. And that was, you had the students presenting this whiteboard to the class, instead of having other formats such as, having a board meeting where students circle up and things like that. And I think one of the things we often forget is that the learning that we're, that is taking place, is typically not necessarily heavy on the presentation part. It's actually a lot of it takes place while the students are discussing and preparing their whiteboards. And I think we forget that because it's kind of almost a hidden learning that's taking place. But that student-to-student discourse is so incredibly valuable. And I just encourage people not to discount the learning that's taking place then.

Kelli Warble (34:24):

And then also to be aware that there isn't just one format for a whiteboard session and you sort of have to tailor it to the group of students that you have. So sometimes if you do a circle board meeting, students are having trouble staying engaged and paying attention to each other. So perhaps instead you do something like a gallery walk where they hang up all their boards and circulate through on their own and put comments on them. So you just have to really read the room and your students and decide what's perfect for that group at that time.

Mark Royce (35:00):

Very good advice. Don't short time your students' prep, you know?

Kelli Warble (35:05):

Yeah, yeah. For sure.

Mark Royce (35:06):

Okay. This is my favorite tip that you gave

Kelli Warble (35:10):

<laugh>. Okay.

Mark Royce (35:11):

You said, if you look up the word "cover" in the dictionary, I'm gonna let you explain it beyond that <laugh> the word cover.

Kelli Warble (35:22):

Yeah. This actually also comes from Larry Dukerich. So he was my first workshop leader for several workshops in a row. So a lot of my advice I have to attribute to him. He noted, you know, if you look up to cover, one of the first definitions that comes up is to obscure from view. So, we as the teacher are often admonished, we need to cover all of the standards and, you know, you've got to get through this laundry list of a thousand things, before the end of the year. And if we, but really when we do rush through those standards and try to cover them all, we are doing the equivalent of obscuring them from the view of our students. Because it goes so quickly, it's just not good, deep conceptual understanding. So don't be so anxious about worrying about covering every item with your students if you have the power to do so. I know a lot of people, nowadays, unfortunately, they might be a little bit micromanaged in their classrooms and be told exactly what they have to teach on which day. But, do keep in mind that just because you cover something doesn't necessarily mean the students are going to really understand it and be able to apply it

Mark Royce (36:48):

And retain it

Kelli Warble (36:50):

<laugh> and retain it. For sure. <laugh>. Absolutely.

Mark Royce (36:53):

That's really good. Oh, I have a quick thought, a question. You're teaching physics at the university. Are you using modeling in that classroom?

Kelli Warble (37:06):

Yes, I do use modeling instruction, but one of the classes I teach is the modeling workshop. It's the methods of teaching physics, but it's a modeling workshop. The other class I teach is a physical science class and it has about between 70 and a hundred students in it in any given semester. So I've had to do kind of an altered version, but we still whiteboard, we still present whiteboards. We still use the idea of students encountering a phenomenon in the lab activity prior to me telling them about it. And they will come back. Lab is separate from class, but they will come back and they will discuss whatever they saw in the lab during the normal class time as a whole class. So yes, I definitely am, but kind of hybridized or altered a little bit to be appropriate for that level.

Kelli Warble (38:08):

And you do have to, to fool with it. One other thing I would like to mention is that recently in that class I've been looking into, it's called the Next Generation Physics and Everyday Thinking Curriculum, which is a curriculum for... It was geared towards training elementary science teachers. And it has lots of hands-on simple activities in magnetism, static electricity, energy and interactions and waves, sound, and light. And those materials are phenomenal and they're very aligned to modeling instruction. So that's my recent tip for teachers is think about looking into those materials when you need simple activities to have students perform to get engaged in some high-level physics.

Mark Royce (38:59):

And those materials are available where?

Kelli Warble ([39:03](#)):

You know, I think they're available now from Activate Learning, but if people sort of do an internet search on next generation PET, pet, which is physics and everyday thinking, you will find them. One of the co-authors is also a co-author on the CASTLE curriculum, which, modeling instruction, we had a partnership with them a long time ago. They graciously let us use their materials and alter them for some modeling workshops in electricity and magnetism. I think we would benefit from having a partnership maybe with next generation, physics and everyday thinking too. But meanwhile listeners, you might wanna look into that curriculum. So thanks for the last question. I had to get that last little thing in there cuz it's been valuable to me.

Mark Royce ([39:59](#)):

That's really great. It's been awesome. So, we're kind of out of time, so I'm gonna say thank you so much. Thank you so much for taking the time and, I hope your teaching just blossoms with all kinds of wonderful fruit and just keep on keeping on. And my wife said to tell you Hello

Kelli Warble ([40:26](#)):

<laugh>? Yes. Hello, Brenda <laugh>. I haven't gotten to see her in a while, so yes. Hello right back and thank you. And I hope my teaching does continue to blossom and usually when it does, it's because I learned something from someone in this community, in the AMTA. So thank you to everybody who's, who's inspired me so much. I really appreciate it.

Mark Royce ([40:47](#)):

Thank you, Kelly. Thank you so much.

Kelli Warble ([40:49](#)):

Uhhuh.. Bye.