Mark Royce (00:00):

Hey, Jim, how's it going?

Jim Stankevitz (00:03):

Hey, Mark. It's going well, thanks for doing this for us.

Mark Royce (00:07):

Yeah. Remind me where you are right now, where you're living.

Jim Stankevitz (00:11):

I am living now in Zionsville, Indiana outside of Indianapolis. We moved here back in November of last year. I had been a long time resident of the Chicago area and my younger son moved here with our twin two year old grandsons and we said, okay, we're not gonna commute the three hours between Chicago and here. So we moved down here to be close to them.

Mark Royce (00:38):

That's awesome. So I know that you're retired now, but you have been a modeling instructor for over 25 years. Is that correct?

Jim Stankevitz (00:52):

That's correct. Mm-hmm

Mark Royce (00:54):

Yeah. You got started in modeling in '97, I believe is what I read.

Jim Stankevitz (01:01):

Well if I go back to when I first heard about it, it was 1995.

Mark Royce (01:07):

'95. Okay.

Jim Stankevitz (01:11):

I started with the workshop that Greg Swackhammer led at the University of Illinois, Chicago, that summer.

Mark Royce (01:19):

How'd you find out about modeling instruction originally?

Jim Stankevitz (01:23):

Um, well I was a member of the AAPT and I subscribed to the physics teacher magazine and it was the issue that the force concept inventory first came out that I saw that and I thought, Hmm, this is kind of interesting. And I read the article, took a look at the test and I thought, well, my students should really do well on this. I think they're gonna ace this test. And so the article kind of encouraged people to administer it, to see how our students would do so I gave it fully expecting them to do wonderfully well.

And when I looked at the statistics of the Scantron result, it's one of those moments where you kinda remember all the details of your surroundings, because it was so traumatic <laugh> the scores were just abysmal and I was shocked and I thought, I must have filled out the key wrong or something. This can't be, but I checked and double checked and sure enough, my students were averaging under 50%.

Mark Royce (02:32):

Wow.

Jim Stankevitz (02:33):

And, I just had this sudden awakening of, oh my goodness, what have I been doing all these years? I thought I was doing a pretty good job and the FCI results were so bad that I really had to self-examine how I was teaching and what my students were learning. And there was this big disconnect between what I expected them to be able to do and what they did. So along with that article was an ad for the summer workshop that Greg was running that was specifically aimed at addressing student misconceptions. So, I signed up for it and thought, well, I'm gonna give this a try.

Mark Royce (03:20):

Very cool. So you started modeling after that workshop. And tell me a bit about how it changed you as a teacher, your approaches to the classroom and especially in those early years.

Jim Stankevitz (03:40):

Well, I have some very vivid recollections of doing modeling with my students that first year, having them get up there with whiteboards and lead presentations of lab results and to lead discussions of problems sets. And I distinctly remember thinking, boy, have I underestimated what my students could do. I know in the past I would think, well, they're not gonna get this. I'll have to tell them. And when I started modeling based on what Greg had told us to do, I was like, okay, I'm gonna let them struggle with this, perhaps, but they're going to do it. And they amazed me so much because they were able to do it, took a little bit more time, took a lot of very, very careful listening. I just, I remember being exhausted at the end of a school day more than I had ever been because I had to really, really concentrate and listen to what my students were saying, because as I found out, what they were saying and what they weren't saying were hiding all kinds of misconceptions that I had never imagined they held, but simple questions like, well, how did you know, why did you do that, just exposed all these things that my students were thinking that it kinda shocked me at first. So I stuck with it. And of course back then, the only materials available were mechanics. So I finished the semester and finished the mechanics and thought now, what do I do? There was nothing else. There was no optics. There was no E and M. And I thought, well, look, I can't go back to teaching the way I used to. I just can't do it because I had seen the successes of my students. So I kind of muddled my way through second semester and, you know, did a little optics and a little E and M and tried to do it in a modeling way. But of course I didn't have the materials. So that was, it was a bit of a struggle. But then that second year of the workshop at the University of Illinois, Chicago, we worked on just starting those second semester materials and developing worksheets and labs that were consistent with the modeling philosophy.

Mark Royce (06:09):

Hmm. That's interesting. I wanted to know, you've been doing it for 25 years. And when you first started teaching, what were some of the challenges that you faced at the beginning? You know, what kinds of, uh, things did you encounter that, that challenged you that caused your growth?

Jim Stankevitz (06:33):

Well, the, the biggest thing I think was just my students were so, they're just not used to getting up in front of their peers and basically taking over the class. Even though I was still questioning, they were the ones up at the front, they were the ones that were elaborating on ideas. And that was very difficult for my students. They just hadn't seen that before. And, uh, I remember in particular, one, one girl who I think it was like the end of October said, Mr. Stankkevitz, are you ever going to respond to one of our presentations with something other than what do you think? And of course I responded, what do you think? She was just so frustrated. I also had to deal with parents who were hearing stories from their sons and daughters that, oh, my physics teacher he's really not teaching me.

Jim Stankevitz (07:33):

And, I in particular had one father who was a physics professor at a nearby college. Who contacted me and was just adamant that what I was doing was so wrong. He said, what you're asking these high school kids to do is way beyond what I, would ever ask my college students to do. And when I talked to him, I said, but they're doing it. They are succeeding. They may not like it, they may feel frustrated at times, but they really are succeeding. So after a few other phone calls back and forth, I invited him to come in to my classroom to see what the students were doing. I made sure it wasn't in his daughter's classroom, but he came in and he observed my students. And he was so impressed. He really became one of my strongest advocates after that. Because he said what you are getting these high school kids to do. I never thought they were capable of doing it. And I said, that's me. I never thought they were either. But they were.

Mark Royce (08:45):

At the time you began using modeling instruction, it wasn't as well known as it is today. It's getting much more accepted across the US, and even other places in the world. But you encountered some resistance, I would imagine, in those days, 25 years ago that teachers may not face as much or maybe, maybe teachers do, you know? I don't know. But how did you find dealing with that resistance? I mean, you just gave me one example of a parent who was a professor What did you learn in dealing with that kind of resistance?

Jim Stankevitz (09:31):

Well, first with my students, what I learned that really helped was every now and then I kind of recollect doing this towards the end of each unit was to just stop and have this discussion with my students about what I was doing and how they were reacting to it and kind of, I don't know, just letting them in on what I was doing was something that they also were not very accustomed to by teachers. And so I would explain to them the modeling methodology, and why I thought it was so important that we deal with the classroom activities the way we were. And I thought that that opened up to them, the idea that, well, we're all kind of in this, I said, I'm new with this. I know I'm gonna be making mistakes, but here's why I think it's important for you as my students to have class this way.

Jim Stankevitz (10:29):

And, I think that helped. And I did that oftentimes too at, like curriculum nights with the parents, to say, be very open about what I was doing. And even though, you know, the parents or some of the students wouldn't necessarily like it, I wanted them to be a aware of what was happening. And it also helped with my colleagues, cuz this was so new to them too. And many of them were excellent teachers, wonderful teachers, but they would go by my classroom and see what my students were doing and were kinda

shaking their heads. Like what is he doing in there? What's going on? And I was fortunate enough to have a good friend, a colleague, Tom Todd, who saw what I was doing and thought, this is really neat. I think I want to try it too.

Jim Stankevitz (11:21):

So the second year after I did modeling, he took a workshop at River Falls in Wisconsin with David Braunschweig. And he came back. So now he was doing modeling and he also was an astronomy teacher. So he was doing physics and astronomy and started to develop astronomy materials, using the modeling approach. And it kinda snowballed after, you know, a few years, most of the physics teachers decided they wanted to teach this way. So we started running district workshops for my colleagues, to train them in modeling and were able to get, an offer of a graduate credit option, which always was a big incentive because it included salary increases. And eventually we started to invite teachers from local schools near us. And from there it just grew and grew. And so by the time I retired, it was a requirement for new hires to go through modeling training. And as a result, all of the science disciplines in our department were being taught, using modeling by the time I retired.

Mark Royce (12:40):

Wow. That's pretty cool. That's a pretty big influence that you had, you know, starting it off.

Jim Stankevitz (12:48):

Well. And, and I have to say I had wonderful support from our administration. We had a principal who backed me entirely and he was aware of some of the blow back I got at the start, but he was like, look, I trust Jim, he's a professional. We're gonna do this. We're not moving kids out of Jim's physics sections into other sections. We're just not gonna do it. So he supported me. And in the end, our district did too, because they supported the workshops that we were running along with the teacher training for the other science teachers in our district.

Mark Royce (13:31):

Are you familiar with-- you probably are-- physics first?

Jim Stankevitz (13:35):

Yes. Very much.

Mark Royce (13:35):

Did you guys practice that or what are your thoughts about physics first?

Jim Stankevitz (13:43):

We, we made a strong attempt to do physics first in our district. Now we are a two high school district and we did have to have consistency in the offerings that we were doing. So we actually did a lot of research on physics first. I was fortunate enough, being near Fermilab, that Leon Letterman, the director of Fermilab, Nobel prize winner. He was very much a physics first advocate. He actually came in my classroom and watched a modeling session. It was actually before he went to Arizona State to talk with David Hestenes. So, we had some pretty strong advocates for us. Now, the difficulty was that our sister school was not as strong a modeling school and they pushed back on the impetus that, you know, we were looking for going to physics first. In the long run, one of our superintendents made the decision

that they were not going to force both schools to do the physics first curriculum, because even though we wanted it and thought it was a really great idea, the other school didn't and our superintendent, was I can't, I can't mandate methodology on my teachers. So we, we were still free to do modeling, but physics first was not something that was gonna happen.

Mark Royce (15:18):

I'm glad at least your school got very deeply committed to the modeling approach. That's great.

Jim Stankevitz (15:25):

Although we didn't get physics first, we did change the curriculum in such a way that there was a phys/chem course that eventually was introduced for freshmen. So it was a semester of physics and a semester of chemistry. So, and at least at our school that was taught using modeling methodology. So they eventually did get that physics semester in their freshman year.

Mark Royce (15:52):

Yeah. Oh, that's cool. I'm curious about what you would consider your greatest strengths in the classroom, especially as it pertains to modeling of course, but what do you think your best stuff was that you really focused on and excelled at?

Jim Stankevitz (16:11):

To me, the whiteboard presentations, whether it be lab results or whether it be problem solution presentation, that was the key to my modeling classroom. So I really worked hard those first few years during student presentations to take notes. What were my students saying? What were the misconceptions that were being exposed as a result of their presentations? So that in subsequent years, I kind of had an idea of the things I wanted to target during whiteboard presentations. And I think I became a pretty good listener of what my students were saying so that the famous, what does "it" mean <laugh> was kind of one of my pet peeves, when you say it does this, or what, what exactly do you mean? So I kind of focused on that, but it, uh, yet there I'm using it, <laugh> <laugh> is so hard not to use it and assume that, you know, what the listener understands by that.

Mark Royce (17:23):

Right.

Jim Stankevitz (17:24):

So I think I became pretty good at questioning and leading whiteboard discussions without giving answers. And I just think it helped my students so much to be able to get in front of their peers. That was difficult of course, for them, but to eventually get to where I wanted them to go through Socratic dialogue and appropriate questioning. And I think that was, it was the thing I found at the very beginning was hardest for me to do. So I think I really pushed myself to focus on that. And I think I got pretty good at it after a while.

Mark Royce (18:01):

What other techniques and insights have you gained and discovered that help students in the classroom connect with, especially some of the more challenging ideas that are presented, cuz there are some aspects of the physics classroom that are just kind of common roadblocks for kids learning. What are

some of the tricks and, and techniques that you found that you could use to help connect those kids to good thinking and good learning in that area?

Jim Stankevitz (18:36):

Yeah. One of my favorite problems it came in the first motion unit. It was an average speed problem with race cars going around a track. And Greg Swackhammer showed us that problem in the workshop and like pretty much everybody, I fell for it. I was just trying to do a simple average when that was not the way to solve that problem and that stuck with me for so long that I not only had my students do that problem, but then I stopped the class and we had a discussion about how that problem could be so difficult. When on the surface it seemed so easy. And I said to them that I called it my modeling moment because I emphasize then that look, you are going to use the models that we develop in here to solve these physics problems.

Jim Stankevitz (19:38):

You are gonna use algebra, certainly. But if you're gonna go outside our, I called it our modeling toolbox, and use something from algebra, geometry, trig, calc, whatever you're gonna go to make sure that you still understand the physics model. I didn't want them to just end up using algorithms to solve problems and find trick ways to do it without the understanding. So we would periodically, I would stop the class and say, okay, this is another one of those modeling moments. And then they'd kind of groan, but they'd really become conscious of trying to use the models to do problem solving rather than other shortcuts. And throughout the year, we would often laugh at that race car problem as kind of the, oh yeah, here we go again, because they eventually saw the value in using those models to do problem solving rather than just some algebra trick, for example.

Jim Stankevitz (20:45):

And in the lab situation, uh, our labs were all very much open-ended. So they also were challenged to take on the responsibility of crafting procedures in the lab and then to defend those to their peers as well. So I also know that that takes a lot of time and you had to let those kids have that time to fail and try again and try again until they eventually would get it, but they would appreciate it so much. And when we ran our workshops at our school, in front of, I don't know, sometimes a hundred, hundred and 20 high school teachers, we would have, like a forum discussion where we would invite in the middle of summer, some of our former students to come in and just talk openly about their experience in a modeling classroom.

Mark Royce (21:41):

Wow.

Jim Stankevitz (21:41):

And this was across the board from our freshman basic level all the way through senior AP physics. That these kids would articulate their experiences in the classroom. And they would say, look, I didn't always like it. I didn't always like having to get up in front of my peers and think on my feet, but they, almost to the person would say, I really appreciate what that ended up being for me as just this learning experience that they would take not only from our high school, but but beyond. And they became really good listeners and questioners themselves. Wow. And to me that was the most rewarding thing about the modeling experience was just hearing those kids talk about what it was like to be in a modeling classroom.

Mark Royce (22:36):

Did you guys record that? The students responses?

Jim Stankevitz (22:40):

I know that we did in the past, like the last two or three years of our workshops at our school. We did. Yeah.

Mark Royce (22:47):

Yeah.

Jim Stankevitz (22:48):

It was very powerful.

Mark Royce (22:49):

Those would be really powerful. Yeah. Very powerful to share, you know, do you guys have those available somewhere for people to,

Jim Stankevitz (22:56):

Uh, well, since I'm retired, I'd have to, I'd have to get back to our

Mark Royce (22:59):

oh, sure. Right, right. I forgot. <laugh>

Jim Stankevitz (23:02):

Our tech guru guy who, who was there doing 'em but, they may be available. I can check. I can certainly check.

Mark Royce (23:09):

So I know that in 2015 you joined the AMTA board.

Jim Stankevitz (23:15):

Yes.

Mark Royce (23:16):

And I assume you were a member of AMTA before that. As a modeler. Talk to me a little bit about what you feel about the AMTA and its role and contribution in our country, really, you know, with education.

Jim Stankevitz (23:36):

Well being on the board, it just really got me to see the breadth and depth of modeling that's going on. And, you know, we know there's certain hotspots, where there are a lot of modelers and those areas are phenomenal in, you know, the colleagues that you can quickly go to and get helpful information from, but to have kind of the view from the inside of all the workshops that were going on, when I was on the board, it was pretty typical to have 50 workshops in a summer. And just to see the number of dedicated modelers that were being trained, it was quite impressive. And it was, again, a time I think, where

modeling expanded into other disciplines beyond physics, where of course it started. And those other discipline areas were getting better and better every year at the materials and training teachers. And just to see the scope of that, and then to see all the STEM organizations that were starting up so that those teachers did have local communities to confer with, that was really encouraging to me.

Mark Royce (24:58):

You were the president of the board for a year? Was it '17 through '18? Was it one year or was that a two year?

Jim Stankevitz (25:06):

I was president, right. From '17 to '18. Yep. Mm-hmm <affirmative>

Mark Royce (25:11):

And so what did that experience teach you?

Jim Stankevitz (25:17):

It taught me that leading discussions of board members is more difficult than leading discussions with students. <laugh>

Mark Royce (25:32):

Oh my goodness.

Jim Stankevitz (25:34):

The wonderful breadth of ideas that people brought to the board meetings, only a small fraction of all those ideas ever get put into action because there just aren't the resources, but to hear all the wonderful ideas that the board members had for implementing and expanding and promoting modeling. It was neat. I just wish we had more resources so that we could do all that. It was tough trying to decide what exactly would get done because there's so much to do.

Mark Royce (26:14):

Yeah. Yeah. And it's a truly grassroots institution, you know, that's grown, but, you know, it's not like government funded or that kind of thing. And so, yeah. So, what would you say to our listeners? Uh, let's say, to someone who is not an AMTA member, AMTA member, what would you say to them to encourage them to get involved with the, AMTA as a member?

Jim Stankevitz (26:46):

Well, I think the main thing is that there's this wonderful community of teachers out there that you can access through the AMTA that can be of great assistance. And, you know, when I first started modeling, there were such a small number of people, but the people that were in our workshop at University of Illinois, and then later on, when we joined up with the Arizona State people, they were such a wonderful resource that we could go to. Back then list serves were in their infancy. And it was such a new thing, but it was, it was great that you could post a question to the list serv and get 10, 15 different opinions and answers to help you out. And that's what I think is so great about the modeling community is that they are available for that kind of, assistance in the form of discussions, ideas about labs, ideas about whiteboarding, you name it. So I really encourage people who take a workshop, to not only join the

AMTA but to stay active in it, because there is a tremendous amount of resources available that they can take advantage of. And then the challenge I always gave our workshop participants at the end was, okay, now it's your turn. You have hopefully benefited from this workshop. Now I want you to become the advocate for modeling and get your colleagues involved as well.

Mark Royce (28:22):

So Jim, you've taught so many workshops over the years, these last several years. Tell me about that experience of teaching and what you learned and how you grew and how you influenced others. You know, that whole thing, how was doing workshops?

Jim Stankevitz (28:38):

Leading the teacher workshops-- it was so different than teaching students because here were people with all kinds of teaching experience levels, some brand new, some teaching for 20, 30 years, in some cases, who brought such a wealth of experience and background and views from schools and districts that were so much different than mine. And to be able to spend time talking shop with these people about how to implement modeling in the variety of conditions and courses and various communities was just wonderful to be able to do that and opened my eyes to the difficulties that many teachers face. I think I'm most impressed with the teachers that come out of the smaller schools and mainly rural areas that they have five preps and they're all five different sciences. And I'm like, I don't know how I could wrap my mind around that.

Jim Stankevitz (29:43):

But to be able to give them some insight into modeling in those other disciplines, even though I wasn't certainly qualified in the content area, I thought was one of the most rewarding things I did during those workshops. And we just, we had so much fun. It's such a blast teaching teachers because I was able to, we used to joke around, we put 'em in student mode where we want them to act like students, so they would get the modeling experience. So that was, that was very rewarding for me too.

Mark Royce (30:23):

Yeah. That's awesome. Is there anything that you would love to say to our listeners, especially the younger modeler or early? I don't know how to, I don't know if I wanna say younger people, but the people who are more new to modeling, what's your final parting words of wisdom that you would share as a very well established modeler?

Jim Stankevitz (30:46):

I think I'd say, thinking back on my first experience is to stick with it. It was so rewarding to see it at the end of that first year, what my students were doing compared to what they had been doing before. And I think if I had had quit at the beginning, cuz it was so hard for me, that they never would've gotten there. And I know a lot of people are in districts where that's a very difficult thing for them to do, be it because of curriculum requirements, parents and students that aren't necessarily buying into modeling when it first shows up. But, stick with it, be open about what you're doing and why you're doing it and give it time. And if you do, I think you'll be amazed at what your students are able to accomplish.

Mark Royce (31:41):

That's great. Well, Jim, thank you so much for taking the time outta your schedule to talk with us and to share your insights. It's been really great. And I wanna just say thank you one more time.

Jim Stankevitz (31:57):

Well, thank you Mark. I really appreciate what you're doing for modeling and having things like this podcast is a wonderful resource for, I know, lots of teachers out there that are looking for as much assistance in modeling as they can get. So thank you.

Mark Royce (32:15):

Oh, thanks Jim. Okay. You take care and we'll look forward to seeing you sometime.

Jim Stankevitz (32:21):

Okay. See you Mark. Boom.

Mark Royce (32:24):

Bye. Bye.

Jim Stankevitz (32:25):

Bye bye.