



# Science Modeling Talks

## Episode 59 - "Helping to Launch the AMTA"

Guest: Patrick Daisley

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Mark Royce (02:09):

Hey there, Patrick. How are you doing?

Patrick Daisley (02:12):

Well, I'm doing well. How are you doing?

Mark Royce (02:15):

I'm doing okay. I'm surviving all of it. And, you know, moving into this retirement. Brenda finally retired, and so the two of us now have room in our lives for the things we need to do.

Patrick Daisley (02:29):

Yeah, I've enjoyed my year of retirement. One of the things that I found is, it's a good thing I really like my wife, because she's always there. <laugh>.

Mark Royce (02:40):

Yeah.

Patrick Daisley (02:42):

24/7.

Mark Royce (02:44):

I think we'll be discovering that same thing. I retired a year ago, but she just now retired, so I didn't have that until right now, but at this point, I'm loving being with her this much. It's been great for us

Patrick Daisley (02:58):

It is. It is good.

Mark Royce (03:01):

Yeah. So, I'm excited to talk to you today about your involvement with modeling instruction and AMTA and all the things that you've done over your, what is it, 29 year career with modeling? Remind me.

Patrick Daisley (03:19):

Uh, yeah. Well, my first experience with modeling was in 1998 when I went to the modeling leadership workshop at UC Davis. For the first of two. [I] was there with your wife, as a matter of fact.

Mark Royce (03:42):

That's right.

Patrick Daisley (03:44):

So yeah, I've been a modeler since then. Once I started that, I knew right away that I was never gonna be able to go back and teach in any other kind of traditional way, although I really never taught in a traditional way because, that was probably my third year of teaching when I went down there. And for the few years before that, I had connections with Jim Minstrel, who's out of the University of Washington and was part of a physics collaborative group, I guess, although I was the new guy. But of course he had a very kind of different way of doing it as well. So it wasn't traditional open to book to chapter three and, you know, do the odd problems at the end of the chapter. It was never like that for me, but modeling really kind of refined that for me. And once I was a modeler, I was always going to be a modeler.

Mark Royce (04:54):

What I've observed with modelers and doing this podcast and everything is that a lot of people who end up in the modeling world already had kind of a unique view on teaching. There was a kind of a subtle discontent, you know, that they were seeking to develop or help improve and they discover modeling and boom, they're off and running.

Patrick Daisley (05:24):

A lot of us, I think, have sort of a predisposition, I guess, that kind of, we're looking for something. In fact, I used to describe to people kind of jokingly, but not really that much of a joke, that when I went to the first modeling leadership workshop down at UC Davis, I said, it was kind of like how I would imagine an old fashioned tent revival. So I went down there, looking for something. I didn't really know what, but I found it in modeling.

Mark Royce (05:54):

Yeah. That's awesome. So you go to this workshop in Davis. Tell me about your early response to the workshops.

Patrick Daisley (06:09):

It was very different, right? The way that the modelers taught and what they were telling us was a little bit of a different thing, and that took a little while to get used to. The kind of discourse in your classroom that we do as modelers, took some practice. So we had a chance to practice that. That was, that was really nice. And it sounds like it would be easy, but it's not. I remember we used to trade off in the roles of being a teacher or being a student, and so we would practice being the teacher and trying to lead students in questioning and sometimes we as students would be very stubborn students. One of the times one of our leaders said, you know, don't make it impossible for them, but one of the participants who was leading the discussion wanted to try and bring out what this student was thinking about.

Patrick Daisley (07:18):

And so he asked the most direct question he could, he said, what were you thinking? Well, that particular statement, a lot of kids have heard, and it's not usually in a good context. It's like you did something. What were you thinking? So they kind of looked at him like, what? Did we do it wrong? It's like, no, it was right. But yeah, so little things like that we had to try and learn, which as a teacher haven't really had to do for a while. I know that when we started talking about energy, so that's like the seventh kind of unit. We'd been at it for a while, and it was very different. And I remember thinking, I don't know if I can teach like that. It was so different. And then when I got back, I was doing modeling with my students, and I was trying to be as true to the method as I possibly could be.

Patrick Daisley (08:23):

And unit six, which is about two-dimensional motion, projectiles specifically, came right before energy. And I

remember in the previous years how difficult it had been for my students to really kind of come to grips with the ideas behind projectile motion. It was really hard for them. And I would do demonstrations and I'd give really great lectures that weren't that great <laugh> and all these things that I could do, and they just really struggled with it. So we did the Paradigm Lab, which involved tossing a ball and taking a series of photographs, didn't have video at the time. So I would shoot the video, but then I would capture like every three images and print those onto paper. I didn't have the computer technology, the software to analyze video at that time.

**Patrick Daisley** (09:25):

And then I would take some graph paper and print it on transparencies so the kids could put the transparencies on top of the photographs and then gather position data and time. And so they did that, and then we were whiteboarding the lab and the post lab, and the kids were up there and they'd display their whiteboards and they'd say, well, this looks like it's moving in a constant velocity in the horizontal direction. It's accelerating in the vertical direction. Well, that makes sense. The only force on it's in the vertical direction. So yeah, that's it. I'm looking at 'em going, you understand that? Oh, yeah, yeah, clearly get that. And so I asked a few questions and they did, and I'm like, oh my gosh. So that was the moment I think I thought, okay, this works. So when I get to the next unit, which is energy, it's like, okay, okay, I'll try it their way.

**Patrick Daisley** (10:26):

And energy became sort of my, I don't know, pet project, I guess after that I'd drive other teachers crazy talking about energy, because it opened my eyes when I started seeing it taught that way. And I just knew from how well they did with projectiles that they were gonna get the energy as well, and they did. So that first year, I still maybe started off willing to try it, but I didn't really understand just how powerful it was until I was, you know, a little over halfway through the year and it's like, wow, this really works.

**Mark Royce** (11:08):

Yeah. That's awesome. I wanna ask you, in the, probably, especially in the first few years of using modeling, what were some of the challenges that you faced as you were developing your approach to the modeling instruction?

**Patrick Daisley** (11:25):

Well, there were a couple of them. It wasn't widely accepted amongst my colleagues and the administrators at the school didn't really think much about it. Although they supported me going down there and so in the department, if I would try and share any of these ideas with people, they didn't wanna hear it. They just didn't. And the head of my department at the time especially, didn't wanna hear it. And so that was a bit of a challenge because in some ways I felt like they kind of worked against me a little bit. And when you're doing this kind of teaching with your students, you're putting an awful lot on your students to think and reason.

**Patrick Daisley** (12:21):

And you'd hear an awful lot of, can't you just tell us? Can't you just tell us what we need to know? No, we're gonna figure it out. We're gonna develop these ideas ourselves. And so that was a challenge. And so there were some complaints to people about that. Like, he just won't teach. He just won't tell us. He's not teaching. It's like, okay, well, and again, it was hard for the department and even the administrators to understand that. 'cause by the way, nobody came in and watched my class and nobody asked me any questions about it. They just didn't wanna know. And it's like, now you're being a problem because your students are complaining. It's like, okay, well, but one of the things I think that helped was, Larry Dukerich, who's been a modeler longer than I have been, one of the original modelers...

**Patrick Daisley** (13:20):

He came to visit our workshop down at UC Davis, and he told about something he had done, which was, schools have open houses every year, usually in the fall. And he would have his own open house for his physics classes.

And he would send out a letter to the parents, invite them to come in where he could then show them some of the things that the students were doing, like with the labs and things of that nature, and maybe even some of the work that they had on whiteboards, and explain what it meant to be in a modeling class. And then, students would have fears, or parents would have fears that their kids wouldn't be ready to do this in college. So he would share data about how they do on the FCI and compared to how university students do on the same test, and showed that his kids were doing better.

**Patrick Daisley** (14:24):

And so I thought, you know what, I'm gonna do that. And so I went out and got some stationary and made up these, really fancy invitations, kinda like, here's an invitation you really can't refuse. And it was on special paper that had like fall leaves on it. And I sent this out, and then I invited my principal and my department head and some downtown administrators, but I didn't think they would come and they didn't, but my administrator did. And he came in and he saw like 30, 35, 40 parents come to this special open house. And I had set up coffee and tea and Costco snacks, and my wife was there to kind of run that part. And when he saw all this and what a positive message there was, it changed. And it did help with the challenge because at that point, I didn't feel like I was being worked against so much anymore. It's like, oh, okay. And that helped a lot. So, I mean, I would recommend that to anybody: add that open house. I did it every year for years after that, I kept doing it.

**Mark Royce** (15:42):

That's a great tip for our listeners. If you haven't thought of that, that looks like a great way to build some trust and to really connect with your people.

**Patrick Daisley** (15:57):

And one of the things that I would make sure to do, about a week or so if I could before the school open house, because my thought was, if they're only gonna come to one open house, I want 'em to come to mine. But a lot of them would come, would come back for the regular, but the regular school open house, you only get like 10 minutes with them. But they would come in, and we were there for an hour or longer with my open houses. So, yeah. Yeah, I think that was, that was, that was great advice.

**Mark Royce** (16:35):

Yeah. That's really cool. So, I know that you did quite a bit of work with helping develop curriculum and techniques for teaching integrated science, so more disciplines. Tell us a little bit about the work you did there.

**Patrick Daisley** (16:52):

Well, after the two years at UC Davis, Jane Jackson emailed me and asked if I would be willing to come down there to ASU, which I'd never been there, to work with a group of teachers to try and develop models to come to sort of do physics and chemistry integrated together, try and do that. So we didn't have any chemistry modeling stuff at that point.

**Mark Royce** (17:27):..

Right. It was all focused on physics.

**Patrick Daisley** (17:29):

It was all physics. And so I said sure. I went down there and stayed in one of the graduate dorms and found out just how hot it can get in Tempe in June and July. Which was also something that, that open house that I had it helped with because the school district where I was up here in Washington, school doesn't get out as early as it does places like Arizona. So they were having this, they were doing this work. I still had a week left of school to teach. And I went to my principal and just 'cause I thought I should ask, and said, gee, here's what's happened and I'd like to go

down, but I understand that's probably not possible. And he goes, no, no, no, we can do that.

**Patrick Daisley** (18:21):

That sounds like good work for you. And so, they hired a sub for me for the last week, and I got all my grades and stuff together and set up a spreadsheet for 'em and said, so you can enter grades and if their grade changes, then you can change it, otherwise they're already done. And so anyway, went down there and there was a professor from Israel, a guy Ashkenazi who came down and he's an amazing, amazing man. Very smart, very knowledgeable. And a couple other teachers that I hadn't met, and some I knew from Davis. And we went down and for like five weeks, we just worked on these different models and ideas that we could do. And, so ended up kind of going back several times to continue working on things like that. And I really enjoyed it. That was was a lot of fun. I enjoyed doing that kind of work, and I wasn't getting that kind of opportunity here in Spokane because, like I said, nobody showed the slightest interest.

**Mark Royce** (19:28):

Yeah.

**Patrick Daisley** (19:28):

Which was unfortunate.

**Mark Royce** (19:29):

Yeah, yeah. Yeah.

**Patrick Daisley** (19:31):

But I got to do that there.

**Mark Royce** (19:34):

I'll bet you things have changed in Spokane in those many years.

**Patrick Daisley** (19:39):

Nah, still not interested. I managed to get a couple of my colleagues to go down to Arizona to do modeling workshops, so there has been some change, but yeah, it's, I dunno. Yeah. I think it's different administrators, you know, teachers are gonna follow along with what administrators want. Yeah.

**Mark Royce** (19:58):

Sure.

**Patrick Daisley** (19:59):

I think sometimes their attention gets drawn so many different ways. You know, I know in my district, somebody would read a book and all of a sudden it's a big push in the district. So, you know, we did understanding by design for a while, and I thought that was actually was pretty good, and I've been trying and talk about how complimentary modeling and understanding by design were, but they'd all just focus on the understanding by design. And we've gone through a few of those kinds of things, but they cried out any other attention anywhere else. It's funny. I would always ask the question, well, what was wrong with Madeline Hunter?

**Mark Royce** (20:45):

Oh, wow. So I know that you were very involved in the establishment of the AMTA and originally modeling workshops were supported with some grant money for the teachers who would come and participate. And that was a

great thing that allowed a lot of people to get into the workshops originally, but eventually that grant funding was going away. Am I right, at somewhere around that point, there was a group of you who decided we need to keep this going somehow. So pick up the story from there and tell us about the origination of the AMTA and your involvement there.

**Patrick Daisley** (21:33):

Okay. Well kind of starts with having a group of modelers. One evening I was down there, they actually had an advanced modeling workshop, I think that Kathy Harper was teaching. And so I went down for that and it was great. And a lot of us went to dinner in a Mexican restaurant. And what I've come to find out is when a bunch of modeling teachers get together in a Mexican restaurant, you don't really know what's about to happen. And it's usually good things. It's not bad. So we were sitting around and talking about the fact that the grant money was drying up. The National Science Foundation likes to fund emerging ideas, I guess. But modeling had kind of been established a little bit. And so the money was getting harder to come by, and we were concerned that eventually there would be no money.

**Patrick Daisley** (22:26):

And we were all very much supported the idea of modeling and wanted it to continue. And so, one of the things that we did talk about was if we could somehow make an organization. So that night, I go back to my room and I've got my laptop and I just started looking around and I went on to, I'm from Washington, so I went on the Washington State Secretary of State website and was just curious about how you could incorporate an organization and found out. And it's like, well, this isn't that hard. And so I just created a corporation called American Modeling Teachers Association. And, you know, whatever the fee was, it wasn't that much, but I paid for it. And so I went and secured a domain for American Modeling Teachers Association and created a website that was not a very nice website because I'm not really good at making websites, but I can put one up.

**Patrick Daisley** (23:34):

And that's what I did. And then the next morning, I went down and... It must have been, I'm sure it was like a Saturday, we didn't have anything going. So, a lot of the teachers were staying in the same sort of apartment dorm complex. So I went down and knocked on the door and there was a bunch of people sitting around and I said, Hey, look what I did. That's pretty cool. And so, one of them suggested we needed bylaws and stuff like that. So we basically looked at what the AAPT, American Association of Physics Teachers, what their bylaws and constitution was like, and we kind of adopted a lot of that, changed it for us. And we sat there and that was Carmella, her name was Manaya at that time. It's, I think it's Jones now.

**Patrick Daisley** (24:29):

And Rachel Black, who sadly has passed away since then. And there were many others that, not many, many, but several others that we sat around and talked about, you know, what the officers should be and how long they should serve terms. Because this was stuff we had to submit to Secretary of State, to be a corporation, you have to have those things. And so we just, we made them up that morning. And then when Monday rolled around and there were modeling workshops going around and we, the three of us, Rachel, Carmella, and I think Hillary, she also was there with us. And we went to some of these workshops and said, Hey, look what we did, and you can join. And it was only \$25 at that time. And we went around and we went up to David Hestenes and sat in his office and explained to him what we had done.

**Patrick Daisley** (25:20):

And he was very supportive of it. And Colleen was the very first paid member. She just said, yes. That was kind of how it started. I mean, if that's not grassroots and by the seat of your pants, I dunno what is. But really it's the way that it would have to be, right? So we would say that AMTA is for teachers, for modeling teachers, by modeling teachers. Right. This is what it's for, you know, and so it started to grow from there. It certainly took a while, but I

feel like it's come a long way since then.

**Mark Royce** (25:59):

It's pretty exciting. And I think that the effort that you and the other teachers put in to get it created was brilliant and inspired. 'Cause I don't know that the workshops would even exist today without that, without AMTA.

**Patrick Daisley** (26:18):

Well, that was our fear.

**Mark Royce** (26:19):

Yeah.

**Patrick Daisley** (26:20):

Yeah. Well, that's not we get without Jane Jackson

**Mark Royce** (26:24):

<laugh>. Yeah, right, of course. Yeah,

**Patrick Daisley** (26:27):

For sure. But she's a supporter of AMTA, so,

**Mark Royce** (26:31):

Yeah. So when you guys were doing the workshop where this got launched or the idea got launched, that was at ASU, I assume?

**Patrick Daisley** (26:40):

Yes. I think that was in 2005.

**Mark Royce** (26:43):

Okay. So is there something, like a secret that you wish you had known before modeling that you've learned since?

**Patrick Daisley** (26:52):

I mean, I guess there would be lots. I mean, I wish I had known the power that this tech, this call it a technique, it's a pedagogy. It's kind of a, it's, it's more than just a pedagogy. It's a pedagogy for how to teach students. And the materials are just sort of secondary to that. I just wish I had known how powerful it was. I learned quickly, but I wish I had known that. I also wished that I had known, although I wouldn't have changed anything, but I wish I had known how much it was gonna impact me personally as a teacher. And just personally, professionally and personally. I mean, I still know a lot of people that I've met in these various, functions, going all the way back to UC Davis and their friends. And, I'm really happy to know them. They are, without question the most dynamic and accomplished and best teachers ever seen. And I kind of feel like, wow, how did I get in? How did I get into this club? I mean, I guess I'd wish I had known that, but I don't think it would've changed anything.

**Mark Royce** (28:20):

Right. Well man, that is so cool. Patrick, tell me, we have listeners from all different levels of modeling involvement, what would be your best tip to share with a novice modeling person? Or even if you're sitting down and talking to

some more seasoned modelers, what would be your best tip that you would give to any modeler as to how to really be good at the implementation of the instruction?

**Patrick Daisley** (28:54):

Well, that's a really good question. I guess what I would tell them is that it's to realize that it's going to be a challenge, as a teacher, when you're leading a class through, whether it's pre-labs or labs or whiteboarding, you know, deployment activities, that it's really gonna be a challenge. And that you need to expect that and resist the urge to sort of jump out of it, in other words, resist the urge to just go ahead and tell 'em because it would be quicker and you're running out of time. To stay true to the, pedagogy, to let the students talk amongst themselves, develop a lot of the ideas, I mean, you need to be there to guide them and help them along. And, you know, I would tell students my job is not to tell you everything you need to know, but to help you come to understand the ideas. And my job is also to keep you from going off a cliff.

**Patrick Daisley** (30:06):

If I see you heading towards a cliff, I'm gonna stand in front of you and say, are you sure you wanna go that way? And if they go, yeah, yeah, I really wanna go that way, it's like, really <laugh>. And if they persist, then I'm gonna let 'em go off the cliff, but I'll be there to pick them up. But it's very easy when it gets difficult to just say, well, I'm just gonna go ahead and tell them, or I'm just gonna give it to them. And when you do that, it, it starts to lose its effectiveness, to like not spend the time allowing your class to explore these ideas and to develop the models. I think sometimes schedule can be the worst thing because people feel like, I gotta get through all this, gotta get through all this.

**Patrick Daisley** (31:03):

I remember a teacher I worked with once, came to me and asked me about electricity. And I said, well, I don't really do anything with electricity. And they're like, you don't do electricity? And I said, no, I just don't have time. And he goes, well, how are they gonna get it? And I said, they weren't getting it before <laugh>. And so there's no point in rushing through all this stuff to cover it. The coverage is your enemy. It's much better to stick with the pedagogy and understand that the dialogue is super important amongst the students and with the teacher and to not let that go away. Not to skip over that. That's the biggest thing I think because that, and that's what I hear about other teachers that do this. Like, ah, it's just too much work. I don't wanna do it. It's like, well, it works though.

**Mark Royce** (32:12):

Yeah. That's awesome. And, and to have a heart as a teacher for what works rather than what's easy.

**Patrick Daisley** (32:22):

Yeah. Exactly.

**Mark Royce** (32:22):

That's a great encouragement. Well, Patrick, it's been really awesome talking with you, and I've enjoyed it very much and I think you've had some wonderful things to share.

**Patrick Daisley** (32:36):

Well, thank you. I've enjoyed it. I've enjoyed it as well.

**Mark Royce** (32:39):

Thank you for taking the time to talk with me and I wish you all the best and all the joy and fun in your retirement and with your wife. It's awesome. Thank you, Patrick.



Patrick Daisley (32:53):

Thank you very much. And then the best to you and Brenda. Right.

Mark Royce (32:58):

Take care. I'll see you.

Patrick Daisley (32:59):

Thank you. Bye.