



Science Modeling Talks

Episode 84 - Seasoned Workshop Leader - Why Modeling is so Important

Guest: Levi Torrison

Mark (00:55):

Hello there, Levi. How are you doing?

Levi (00:57):

Uh, doing well, thank you.

Mark (00:59):

Awesome. I'm really glad to talk with you today. I'm looking forward to our conversation about your involvement with modeling instruction. And I've heard a little bit about what you've been doing and I wanna learn more about it and I wanna share it with our listeners and let them know what you've been up to. So I'm gonna start out by just first asking how you first got introduced to the modeling world.

Levi (01:28):

Okay. I got out of college, looking for a research job and really wasn't excited about getting too much back into research. I started looking for a job teaching. And I got a job out at one of the community colleges, just the first one that I got offered to. And started teaching chemistry and one of the people there is Dwayne Desbien, who is one of the original members of some of the research done at ASU. He worked very closely with a lot of the original kind of founders of modeling and things like that. And he kind of started talking to me a little bit about teaching strategies and things like that because I wasn't at all trained as an instructor. I was pretty much trained as a research chemist.

Levi (02:21):

I had done some TAing. I'd done like some just general, real quick one-off lectures and stuff like that, but I never really taught classes before. So it was pretty much all new to me. So Dwayne invited me to come into his second semester physics class. And I'm a chemist, so I've got some understanding of physics, but I'm not great at physics. I'm okay. And so I actually sat through almost the entire semester of classes. And I was amazed at how little physics I actually understood. And so he taught in this completely different way. It was all project based. He didn't stand there and lecture. There was no textbook. All the things that I was used to in a standard class, none of that was there. And so I kind of got excited about it, and it seemed like it was a really good way to actually learn the concepts, really understand physics rather than just know some of the equations and some of the math and stuff like that.

Levi (03:17):

And so he'd actually said, "Well, there's actually a group at ASU and there's a chemistry version of what I do. They have workshops over the summer, every summer. You should sign up for one of these workshops." And so I did. I signed up for the Chem Mod one workshop. Russ Schaeffer was teaching it. And it was really my first introduction to teaching like this. This idea of evidence-based, student led kind of instruction. I had always just lectured, basically just stand there and let me tell you all the wonderful things I know. Remember as much as you can and hopeful-

ly you'll spit it back on a test. And so really for me, I sat there through the first week and to be honest with you, I wasn't that impressed with it. I was like, okay, yeah, this seems like a long way to go for a short, you know, I mean, okay, this is great.

Levi (04:12):

It wasn't really until he started doing the energy stuff and started looking at diagramming energy and really looking at energy flow and transfer that I really started kind of understanding what the point of all of this was. That was kind of the aha moment for me was, all right, this is really what the bulk of this is. Really understanding at a core level how energy transfer happens by just simply diagramming things. Wasn't overly complicated. It wasn't a whole bunch of calculus or anything else. It was just very simply, where does the energy go? Can you document it? And that kind of thing. And it, that's about the time where I kind of got sold on it. And then everything else was just kind of added on. I was asked to come and teach the class the next summer with Russ.

Levi (05:01):

And then that was the first workshop that I taught. And I've been teaching them ever since.

Mark (05:06):

Yeah. That's awesome. So you, I think I read you've taught like 22 workshops now over the years?

Levi (05:16):

Yep. I have - this last summer was my 22nd one. Yeah. And I was actually calculating it up and I've done 53 weeks worth of workshops. I just got over a year this last summer, so.

Mark (05:27):

Yeah, that's awesome.

Levi (05:27):

So I started teaching the workshops right away. I converted all of the chemistry classes at the college over to a kind of a modeling-esque kind of a thing. I had some colleagues that were all in on it. They started taking workshops themselves and we just started kind of going from there.

Mark (05:45):

And that was at Estrella Mountain.

Levi (05:49):

Yeah, that's right. Th's right. Yeah. And then now, you know, we've got five faculty members. All of them do modeling. We're starting to get modeling through Phil Root out at Scottsdale. A couple people out at, Chandler Gilbert. There's a lot of people now that are kind of starting to do the same thing that we did so many years ago.

Mark (06:07):

So modeling instruction really changed the trajectory of your career. Is that correct?

Levi (06:14):

Yeah, it did. I was only teaching just to try to figure out what it is I wanted to do with my life. I wanted to get back into research. I wanted to go back into the thin films stuff that I was doing in graduate school. And I needed a paycheck. And so this seemed like the easiest thing to kind of do for now. And then once I kind of got into, the teaching and really the modeling, I started to kind of really enjoy it. And I really found a spot that I could do something with. As I

started teaching the workshops, I really felt like that was the place for me.

Levi (06:58):

Teaching teachers the pedagogy and the content and really getting teachers prepared for kind of a more modern, pedagogy for their students - uh-huh. Is the part that I really enjoyed. And still to this day, I almost enjoy that more than I do teaching my own classes. You know, doing the workshops - because you meet so many different teachers and so many different people throughout the United States. And being able to troubleshoot with them, you know, how to make their class better, how to do labs, you know, how to deal with administrations and how to deal with logistics and, you know, all the different things that come out of meeting people who truly just want to be better teachers, is really a lot of fun.

Levi (07:49):

It's probably what has kept me doing what I've been doing for the last 20 some years, is I feel like I have some sort of a positive impact, I guess.

Mark (07:59):

Yeah. When you're doing the workshops, are you finding that it's mostly newer teachers that you're working with in the workshops? Or is it more seasoned teachers as well? Or how does that kind of work?

Levi (08:14):

It's both. When I first started doing workshops, it was almost all seasoned teachers. We had got, you know, teachers that...probably at least five years of experience, all the way up to 20, 30 years of experience. And it was a lot of teachers who just kind of saw, "Hey, you know what? I don't have the impact on my class I'd like to. I'm kind of stuck - tired of just standing here lecturing out of a book. You know, I, I just, I would like to do something different. I'd, I'd like to do something, something better. I'd like to have a better impact." And so when I first started doing workshops, it was a lot of those types of teachers. Now, later, I feel like it's a lot more pre-service teachers.

Levi (08:57):

Especially out at ASU. I think the last couple workshops we've taught, we've had several students that were just still doing their internships. They hadn't even actually gotten out to get a full-time job yet. And I think some of that is some of the education centers, you know, some of the college education centers are instilling this type of classwork into their degrees. And so I know out at ASU, students can take these workshops as full classes - uh-huh. As part of their degree. And it's not the only one. I mean, these types, you know, student centered teaching, evidence-based teaching, is becoming more and more popular throughout the United States. And I think some of these teachers are getting some of this education early on. You know, it's funny because a lot of times we would have teachers that would transfer fields.

Levi (10:00):

So you'd get, you know, a teacher would come into your workshop and, and say, "Hey, listen, I got told I have to teach three chemistry classes this next fall, or I don't have a job anymore. I haven't even taken a chemistry class since I was in my 20s, 15 years ago, and I have no idea what to do. I got told that this workshop would help me. And so, you know, here I am." And we don't see that as much anymore. For a long time, that was probably three or four or five of your teachers in your room. It's just, you know, science teachers, a lot of times biology for whatever reason, a biology instructor got told that they no longer had biology classes. They have to teach chemistry now. Oh, boy. Um, and so, yeah.

Levi (10:41):

And it's, I mean, you know, it's a good place to be because, you know, yeah, sure, we can help you out with that, but

you feel bad for them because it's like, this isn't really what you'd signed up for. And so somebody's kind of forcing you into a position, but let's try to make it as pleasant as we can, I guess.

Mark (11:00):

Yeah, that's good. So do you find that most of the students that you have in your workshops are headed for or already involved in high school education more than, more than higher ed?

Levi (11:16):

Yeah, mostly, mostly high school. There's the occasional, like, maybe junior high person in there. And I will say a lot of the teachers are looking to do adjuncting. So that's the nice thing about these workshops is, you know, yes, it, it helps, you know, these high school teachers, and there's probably 90% of them are high school teachers; it gives them kind of some really good backgrounds, it gives them some really good activities, gives them a storyline, you know, gives them all of this stuff. But also by getting credits, either through ASU or through some of these other colleges, they also get graduate credit, and then they can go to their local junior college or community college and actually apply as an adjunct and do, like, you know, night school or do...

Levi (12:05):

A lot of them just want a little bit of extra money, so they'll do a class two nights a week. And these workshops actually will help them qualify. I think when I was in Utah, I think three of the teachers there were helping their own classrooms, but they were also there to get credit so that they could get enough hours to be able to qualify to be an adjunct at Weber State that I was at. So that's really common for. The other thing too is that as they get more and more credits, they can, you know, get like a, the Master's of Natural Science, something like that, and they get a bonus in there. They get extra pay. Um, so it kinda does both. I mean, obviously it provides them with great professional development.

Levi (12:51):

I think probably some of the best professional development teachers can really get, but it also kinda helps them, um, both financially and career-wise, you know, just in case they want to do some of these other things, now they have credits to do that with.

Mark (13:03):

Yeah. That's great. So, tell me about your experience and involvement with working with the AMTA, with the American Modeling Teachers Association.

Levi (13:15):

I was one of the lifetime membership people when it first started. Got involved right away. Been teaching workshops through them as well as, kind of with them, for most of the time. Recently, Phil Root and I have been really working on curriculum. We've kind of expanded the second semester chemistry stuff to include some stuff for AP teachers and things like that. We've built thermodynamics stuff through a grant from Jane Jackson, that we're kind of working on putting on the modeling website. Recently though, we've been really kind of working hard at getting some more curriculum onto the AMTA's website for the second semester of chemistry.

Levi (14:12):

That's one that we've been -- Phil, myself, and probably about five or six other instructors have been working really hard on for, like, the last five or six years -- on adding, kind of expanding what was already there. There's always been kind of a second semester stuff on there, but we are kind of expanding it to include a lot of the topics that AP, dual enrollment, IB instructors all need for that second semester. And so we've got most of that up on the website now. We've got some people that are kind of looking through it to kind of work on things like teacher notes and

background. I'm not terribly good at writing teacher notes. <laugh> So there's some people that are kind of helping out with that, you know, kind of being more explicit about what the goals are and things like that.

Levi (14:59):

But that's kind of one of the projects that we've been working on here recently with the AMTA, is just trying to really expand the kinetics, equilibrium, acid-base chemistry, really add a lot more stuff to kind of what was already there, but just kind of fill it out.

Mark (15:18):

This is content that would be available to AMTA members on the - Yep. Okay. So they can access the work that you guys have been doing?

Levi (15:28):

Yep, absolutely. And

Mark (15:29):

It's up there now or are you still working?

Levi (15:31):

Yeah, it's up there now. Um, I was actually looking at it the other day. I will say it's a little bit raw still. Like I said, the teacher notes are being kind of adjusted, but most, all the entire skeleton and everything else is all up on there and it's there. We've been teaching the workshop now for four or five years at different locations. You know, like everything else, always recommend, take the workshop to kind of understand the progression. But yeah, all that material is there and ready to be looked at.

Mark (16:01):

So as kind of a teaser, tell us a little bit about some of the details, the things that you guys are discovering and adding into the second chemistry course, the chemistry two, I guess it is, and, and - Let's tease our listeners so they're gonna wanna go find it.

Levi (16:20):

Yeah. Yeah, no, that's fair. Um, so a lot of it, for that second semester is really the kinetics, and the idea of probability and-- the first part of it is a lot of you have all your particles, you have particle interactions, and then you kinda look at the way that particles are able to interact through attractions. And then kinda the next part is you look at the idea of reaction. And so one of the things with rates is reaction probability. And that's one of the things we really kinda focus on in that is the idea of, you know, in order for reaction to take place, certain things have to happen and there's just a chance of them happening. And you can change that chance by changing the amounts of things or changing temperature, things like that, but ultimately it comes down to just probability.

Levi (17:08):

And so we kinda have a whole section on how that works. And then we take that idea of probability and then we kind of extend it to equilibrium and what it means to be in an equilibrium. And the idea that we're not running out of our reactants. We still have some left and how's that possible based on our probabilistic system before? And then we run all that through to acid-based chemistry, which is a lot of stuff that Phil and I are really pretty proud of. A lot of it comes from the old, old stuff about strength of bases. And we make crazy statements like there's no such thing as an acid. It's just a world of bases and really kind of focus on the mechanism of it because I think traditional teaching of acid-based chemistry is this idea of acids just being a donor of protons.

Levi (18:04):

In the physical world, that makes absolutely no sense. You have a positive and a negative charged species that are fleeing each other for no apparent reason. And it makes absolutely no sense. And so a lot of times, what we try to do is we try to think about systems rather than just think about one thing. One acid no longer has a proton, so it must have just lost it. No, there was a system where something removed that proton. And that energy state has been lowered. And so really kind of focusing on systems and energy states and things like that as the root cause of all of these reactions that we see is kind of what we kind of spend a lot of time on.

Mark (18:46):

You mentioned that there's workshops based around this research. And what are the, when they go to the AMTA site and look at the workshop list, what are they looking for to get into one of these workshops? What's the title?

Levi (19:00):

The chem, it's the chem mod two workshop. Is the one that it is. And it's we're offering it. I know we're trying to offer at least every other year through AMTA. Then Jane is trying to offer it at ASU as well. It's not offered as much. And I'm not sure why. I mean, as I'm sure you know, the workshops are not filling as fast as we wish they were - Yeah. In a lot of cases. Well, the state

Mark (19:30):

Of education in the US today. <laugh>

Levi (19:33):

Yeah. I mean that's a lot of it. And so it is, it's the second semester stuff. We're gonna start kinda adding on some of the thermodynamics because that's the thing it's still probably missing from that second semester material. Mainly because right now, there's just so much. Honestly, it's a three week workshop and then sometimes we try to condense it into two. There's just a lot of stuff, all the labs and all of the time to kind of sit there and think. And so we also have a thermodynamics workshop that we did through ASU that's part of the ma - the natural science program.

Mark (20:11):

Is that available on the AMTA site also or is that a separate thing?

Levi (20:15):

That's a separate thing. But we're working on getting it on because there's at least a couple of chapters there that really are important to the, both the physics and the chemistry teachers. And again, it's a lot of stuff that's been developed from the original entropy stuff all the way through kind of stuff that's been developed through a couple different locations. Us, we had some folks in Michigan that were helping us out with it. We've had some folks out there at Scottsdale Community College that have been helping us out with it. And we're hoping to get that up there as well, but that doesn't really have a workshop right now. Because nobody's really wants to sign up for the thermodynamics workshop because it doesn't really fit with any class that you're gonna ever really teach.

Levi (21:00):

It's just more of informational stuff. And so I don't really know how to kinda put that somewhere where people can access it. It is part of a thermodynamics class out at ASU. But we need to kinda figure out how to kinda add some of that into the curriculum that's on the website. Because entropy is another huge part of both physics and chemistry. And we have a bunch of stuff for it. We just don't really have an outlet for it at this point.

Mark (21:33):

I'm not a teacher, but it seems like that might be more a part of an AP class when it comes to high school specifically. Or it could be of interest to college professors.

Levi (21:47):

Yep. Yeah. Yeah. It is an important part of the AP class, for, I know for all of the chemistry classes. I don't know much about physics, but I know the chemistry AP requires it. And, and so, yeah. And it, it's there. We just need to actually put it in a spot where people can find it.

Mark (22:06):

Yeah. I know that the leadership at the AMTA is going through a lot of stuff right now, but they are also, I know, actively looking to revamp and improve the website and the access to this kind of content and make it easier for people to negotiate in there and find the things they need to find. So hopefully, this will be a part of the development over the next coming months and years. So that's awesome. Yeah. So you mentioned Phil Root. You're working with him a lot. He's teaching where now?

Levi (22:44):

Scottsdale Community College.

Mark (22:45):

Okay. That's right. Yeah. I did an interview with him quite a while back, but -

Levi (22:49):

Yeah, I saw that. Yeah. I saw that. He's been probably, him and I probably worked as partners on a lot of this for probably the last decade. We probably put. I mean, we meet together on a regular basis, even now, still building and rebuilding curriculum.

Mark (23:08):

It's interesting to me because I know that you're both at college level instruction. And that you're working on content focused at that level. But it's really been interesting to hear you talk about how you're integrating the, your research and taking the things you guys are discovering and making it available to high school teachers. I think that's really cool. So.

Levi (23:32):

Yeah. I mean, there's not a lot of difference, honestly. You know, the classes that I teach, you know, I teach the first two semesters of your freshman chemistry class. I teach organic as well, but most of my time is spent with that freshman class. And then you look at a teacher that teaches an AP class or an IB class or even an honors chemistry class their high school. And to be honest with you, there's not much difference. I mean, the content is maybe a little bit faster in a college environment just because you don't meet as often. But the curriculum and the content is very, very close. It's just a little bit a couple years older... But honestly, I've got, probably a quarter of my students are still in high school.

Levi (24:20):

They're just taking classes at our community college just for college credit. So there's a lot of overlap. And I think, you know, the nice thing is that Phil and I do have quite a bit of a content understanding. And so being able to sit down with teachers and give them some of the confidence to teach some of these more advanced topics, and to kind of give them the resources that they need to be able to attack some of these things, I think is great. I mean,

there's no reason that they can't do that.

Mark (24:59):

That's awesome. So Levi, I read, you mentioned something about Pimentel books that you were interested in, in, finding or learning. I don't, know what that is. And so could you explain that to me?

Levi (25:15):

Yeah. So, Pimentel is, he was an educator, a science educator back in the '60s. Really great guy. A lot of chemists, especially chemists my age will know him as the bow tie guy from the old chem study videos. As a matter of fact, the mod chem one up until maybe a couple of semesters ago used to have links to some of the videos that he did. He was the one that had, he did, all of the elements and all the, like, a massive glassware and had access to every single element. Things that we could never do now. They videotaped back in his 60s. It was no big deal. And so this guy, a great educator, wrote a couple of books, on thermodynamics and on chemical bonding. And they're really great books.

Levi (25:59):

We've used them. We've used some of the text as kind of basis for some of the curriculum that we've written. I know, even previous to me, some of the folks that wrote some of the first Chem Mod One stuff were familiar with this guy. The thing is, the books are all out of print. And so we have gone through eBay and tried to buy every copy of them we can get. <laugh> Mitch Sweet, I think, has, like, a whole stack of them to use in some of the classes that he teaches, out at ASU. And so my goal was, okay, well, why can't we get these rights and then just republish it? You know, update some of the stuff. 'Cause, you know, it's late '60s, so all of the units are done in calories and some of the pictures need to be updated and things like that.

Levi (26:42):

But I really didn't want this guy's work to kind of just go away because it, it's somewhat like the earliest, really good science education. The way the book is presented is it's all on evidence. And it's all with this guy's great sense of humor. It's just this kind of like, "Hey, did you think about this? I'll bet you didn't. Well, let's go through and do this idea." You know, and it's, it's literally written this way. And so it's all the stuff that we've loved as far as science education goes. And so one of the projects I'm working on right now is trying to find who owns the rights. I've even spoken to his wife, who's still alive, by the way. A wonderful woman. And she has no idea who has the rights. I went through Berkeley, I went through several different publishing houses, and nobody claims the rights to these books.

Levi (27:30):

And so my goal is to just to try and get these things back out there to republish them and have modern science educators read through some of this stuff because it's really great stuff. And I hate to see it kind of go away.

Mark (27:45):

And it fits in with the modeling philosophies?

Levi (27:49):

Yeah, it absolutely does. And like I said, a lot of the curriculum that we developed for thermodynamics and the second semester of chemistry, we got ideas from it. From some of the experiments that he ran. A lot of it was like thought experiments. You know, "Hey, think about what would happen if this were to happen." You know, that kind of thing. And so a lot of the thought experiments that we came up with are all from that book. Just really great stuff.

Mark (28:12):

Yeah. That is very cool. So you're a very seasoned, workshop leader. And what would you say to anyone who's

listening to this conversation, what would you say to encourage them if they've not been to a workshop, perhaps they've not even considered modeling or they're just hearing about it. What would you say as an encouragement to them about why they should investigate or sign up for a workshop or get involved somehow with modeling?

Levi (28:46):

Sure, sure. So, I mean, the first part is just modeling in general. You know, the thing is being able to open your class up to let students actually explore and learn is, is difficult. In some ways, it's kind of scary for a lot of teachers because, you know, you kind of re - you kind of r- reduce your control on your environment. You know, you wanna be, you know, you've got a list of things that you've gotta cover. You've got a book, you've gotta get to all 18 chapters of that, of that book. You've got all these things. And to sit there and open up the environment and let students just explore and learn on their own is somewhat daunting. And so my advice is, don't really worry about the time-frames.

Levi (29:34):

You know, it is so much worth it to have students learn themselves, even if they learn less actual content. It's so much better for them and they remember it better. They learn all those critical thinking skills, all those things that most science teachers will tell you that they would rather teach critical thinking than content. There are very few of them that really sit there and go, "No, no, I cannot wait to have them memorize the next equation." I mean, that doesn't happen very often. I mean, most teachers will tell you, "Man, I really wish these students would learn how to think." And this is the way to do that, is having them sit down with data, having them perform the experiment and collect the data and do the graphing and do all the thinking.

Levi (30:21):

That's the way to do it. However, there is a learning curve. There's a learning curve for the teacher as well as for the students. And that's okay. Some of the best advice I ever got was from Dwayne. When I first started doing modeling, that was my thing, was we are not doing enough content. We are not getting, this is not a college class. We're not doing everything we should be doing. We're only getting through two thirds of what I used to get through. And I was really frustrated with it for a couple of semesters because I really felt like I was doing the students a disservice. And one of the things Dwayne came up to me and he said, "Hey, I'll tell you what, you still have all of those Power-Point slides from when you, from when you used to teach before?" It's like, "Yeah, I've got them all." He's like, "I'll tell you what, last day of class.

Levi (31:06):

Go ahead and go through all those PowerPoint slides all the way through the end of the curriculum." <laugh> "Just flip through them. The students will get the same amount then that they did before when you're doing it over the course of weeks." Because they're not gonna remember any of that stuff anymore. Oh, wow. So if you're that worried about the content, just take your last day and just, just zip through every single one of them. It'll do just as much good as it did before. And, and I think there's truth to that is that you think that, well, we've gotta cover. And one of the things that Larry Dukerich always said whenever we used the term cover is that cover means to obscure from view. And so, you know, the idea of, well, I've got to hit these topics, they're not understanding it.

Levi (31:46):

They didn't understand it then. In some ways, we're kind of lying to ourselves and just saying that because we said all the big words that they understand them. They didn't. And doing it, teaching this way with a modeling curriculum, you have instantaneous assessment. When you have students that build a whiteboard together as a group and ask each other questions and sit there and go through, you can immediately tell what they actually understand for real. Not just words that you gave them or vocabulary that they just spit back out at you. They're actually become able to ask good questions themselves. You know, why did that actually happen? Well, what is the next step? All of these things. And you understand that they're beginning to go down this path of becoming a scientist. They're

asking the right questions.

Levi (32:38):

They're thinking about things in a better way. And so as you start doing it, you start realizing more and more how much better of an education that the student's getting with this. And even if you don't hit every single chapter of the book, that's okay because what they are getting is going to stick with them so much better. And so that's kind of my plug for modeling and what modeling actually means. The other side is taking a workshop. And I know it's a couple of weeks long. You're committing part of your summer. You may have to go out of state to go do it. All of these things. But I'm telling you, the amount of understanding and the amount of good and good education for a teacher is so important to go to one of these workshops.

Levi (33:31):

Work with your peers, sit there in student mode, work with the facilitators that are there. Go through the curriculum as if you were students one at a time. Going through the evidence, making the logic connections, taking notes about all of the different parts of the lab and things to say, the things not to say yet. All of those things make that transition so much more smooth. You know, a lot of times, you know, you have teachers that, you know, "Well, I don't think I can do this because, you know, I've, I've got all these, the, the, this, these worksheets and I don't know where to go from here." And a lot of it is, "Well, you know, they missed a part of a lab, or they didn't know that they were even supposed to do a lab or a demonstration or any of these things." You know, the modeling curriculum as just, as just a curriculum, there is not much to it.

Levi (34:27):

What makes the modeling curriculum so good is taking the students through all of these things. The activities, the experiences, the talking to each other, the peer review. All of that is what makes that modeling curriculum so strong. And that's what separates it from stuff like POGIL and some of these other curriculum stuff that's very linear. The question number two is, is in question number three. The answer to question number three is in question number four, that kind of thing. This, the modeling curriculum is designed for students to sit down and think about the world around them. This whole idea of making models is that in order for you to learn something, you have to have the --your model of the world has to change in some way. You wake up in the morning, the world works in a very specific way, as far as your model of the world goes.

Levi (35:26):

And unless you're confronted with something that doesn't fit your model, there's no learning to be had. And so the curriculum really is about that experience, about sitting down with peers and thinking about what must happen. That's where that critical thinking, that's where all that kind of stuff happens. As a teacher, it is incredibly useful for you to experience that same thing. That immersion into the curriculum with peers, with facilitators, to sit down and kind of look at, okay, well, this is why we, this is the story. This, this happened first and this gives us a reason to explore this next piece, which gives us a reason to explore this next piece, which gives us this thing. And so that part, there's no way to replace it. I mean, I know, again, you know, it's hard to commit to weeks of time.

Levi (36:21):

I get it, but I've never really had a teacher ever say, "Wow, that was a waste of three weeks of my life." Wow. I mean, that, I mean, that's never happened. Every teacher will tell you, "Yeah, it was a pain to go and take that time out of my life, but I'm really glad that I did it." <laugh> And so I would say sign up for these classes, go find peers to work with. You know, it's incredibly important.

Mark (36:49):

Yeah. Wow, Levi, that was a very powerful pitch. And, I think you've articulated, I think, what a lot of modelers feel that they would like to share with others. And I really appreciate you doing that. That was really excellent. Well, Levi,

it has been really awesome talking with you today. And, and I appreciate your insights. I think those who get into your workshops are very fortunate people. <laugh> 'Cause you're obviously passionate and knowledgeable about the modeling world. And I want to encourage our listeners to, if you're not an AMTA member, go to the modelinginstruction.org website and explore that and learn about becoming a modeler. And you can find out about workshops there that are available and will be coming available. You can also, once you're a member, you'll be able to access the content that Levi has talked about along with a lot of other content as well on the website.

Mark (37:57):

So we want to encourage you to do that. And, boy, I'm really impressed with this conversation, Levi. And I wanna say thank you so much - Thank you. For taking the time today to talk with me. And, I know that a lot of people are gonna be encouraged and informed because of it. So thank you so much. Yeah.

Levi (38:17):

Thank you. Thanks for your opportunity. Appreciate it. I'll,

Mark (38:20):

I'll hope to see you soon. Yep. Okay. Take care. All right, thank you.