AMTA

Science Modeling Talks

Episode 86 - International Modeler

Guest: Urška Manners

Mark (01:25):

Well, hello, Urška. How are you?

Urška (01:27):

I'm fine. It's great to be here.

Mark (01:30):

I'm so happy to have you join me. Um, I'm excited to talk to you because I think you stand with a, a very unique position with modelers that we've talked to in that you're in a different country than the US. And I know there are a few modelers around the world in different places, and I think I have interviewed, one or two, but you have a really unique story with the history of where you've been, all the countries you've been in and taught in. And done educational type things in. And so I'm excited to talk to you about that. What I'm most curious about is how did you first discover the modeling methodologies?

Urška (02:17):

Uh, probably online. I was teaching physics. And I thought I was doing an okay job, but I could tell that my students weren't really getting concepts, especially the, you know, the good ones who would study hard and then they still just wouldn't quite get it. And so it led me to start looking online and for other resources as to how I could be a better physics teacher. And at some point I stumbled across the modeling instruction website. And so it took me a while before I actually got to take a workshop, but it was always in the back of my mind something that I wanted to do. And then eventually I took a workshop and realized that that was, that was the way forward.

Mark (03:00):

That's really interesting. You found it through your own searching - Yes. Online. A lot of the people I've talked to have discovered it because somebody introduced them to it. You know, somebody they knew, a colleague or, you know, somebody had been to a workshop and was excited... But you did it. That's a very interesting thing. So you found the modeling website, modelinginstruction.org, I'm sure. And when, at that point, how long did it take you before you got into a workshop?

Urška (03:34):

Ooh, probably a few years. I wouldn't be able to say exactly, but the problem was I was living, I still am living overseas, and so taking a modeling workshop in the US is expensive. Because you have to fly to the US, you have to pay for it. And actually what happened is Mark Lattery was offering some asynchronous modeling instruction classes. So I started by taking those and that was a really nice introduction. Yeah. But it's a bit hard to do modeling without actually having the experience of doing it. And so I felt like I knew the theory without necessarily being fully confident about how to apply it in the classroom. And then actually what happened is that a parent of one of my stu-

dents met me -- when I was introducing myself at our annual open house, contacted me afterwards and she said that she was actually a chemistry teacher and that she sounded like we were really interesting in similar types of teaching and she was looking into organizing a workshop, a slightly different form of inquiry-based teaching.

Urška (04:41):

But long story short, she eventually got into contact with Colleen. And through that, Colleen said it would be good if the two of us could get some modeling training. And so because of that, I ended up actually going to the US to take a workshop.

Mark (04:55):

Wow. Cool. So this happened, how many years ago did you actually start using modeling in the classroom?

Urška (05:03):

About 2018, 2019. So -

Mark (05:07):

Oh, okay. So you'd been teaching a while.

Urška (05:11):

I'd been teaching for about 10 years when I had started with modeling.

Mark (05:17):

Okay. Yeah. So you were an experienced teacher and then, and then incorporate. So how did modeling change your approach in the classroom?

Urška (05:28):

I don't think it was quite such a radical change in that I had already been using a lot of guided inquiry approaches. So sort of the idea of starting with some sort of a paradigm lab, although I wasn't calling it that at that point in time, wasn't that different to me. But I think the biggest change was giving my students a lot more freedom and sort of letting go a lot more. So when I had done guided inquiry before that, it was a lot of worksheets with really step-by-step instructions of what do you think is going to happen? And now go test it and now did that agree with your results? And sometimes they would roll their eyes at me and say, why can't you just tell us the answer? <laugh>. And so modeling was a lot free, more freeing I think because there is a structure there, but it feels a lot more flexible.

Urška (06:16):

You can kind of just let your class go and see where it's going because you don't have to have all of that material prepared in advance. I mean, obviously as a teacher, you have a pretty good idea of what you want to do, but you can, I feel like it's easier to respond in real time to my class. And I had never been using any of the whiteboards or having the class discussions in that method. So that was really different for me as well.

Mark (06:39):

Yeah. I know that you use modeling to teach in the, and this is kind of a new, I'm not a teacher, so I don't know this. I know most of our listeners are probably gonna know what international baccalaureate physics is, but that was a new term to me when I saw it. And so can you tell me a little bit, tell us a little bit about what that is?

Urška (07:07):

Yeah. So the -

Mark (07:08):

And how, and how it works in the classroom.

Urška (07:10):

Well, just to give some background, the international baccalaureate is a diploma that's globally recognized. And so since I teach at international schools and I have students who come from all over, they need a high school diploma that will allow them to go back to university in their home country. So they have to take exams in six different subjects, which can include one or two sciences. And it's a two year program. So there's some similarities with the AP, except that it runs over a longer time. It claims to be more inquiry based. I'm not sure I agree with that. That's a different story. Um, and you know, I think when you're teaching an exam-based curriculum, there's a lot of pressure to teach to the test. And so one of the things that I've heard from other teachers is, modeling instruction is great or any sort of guided inquiry approach is great, but I can't use that in my exam-based classes because we have to get through the content.

Urška (08:07):

But I don't really actually think that's true. I mean, I would be lying if I said that I never used direct instruction. I think probably most teachers do at some point in time. They're just things that sometimes you have to, it's more efficient or you just don't have all the time that you would like. But I've actually found that since I started using modeling with my students that they seem a lot better prepared. One thing that stood out for me in particular is when I used to teach mechanics, that was the big and scary part of physics that everybody found really hard. And once I started using modeling, all of a sudden they thought mechanics was really easy. And when we would move on to thermal physics, they would complain and they would say, "We don't like doing this. Why can't we go back to mechanics?" Which it used to be exactly the opposite way around.

Urška (08:52):

It used to be that we would get to thermal physics and the students would say, "Oh, this is so much easier." So that was a really interesting revelation for me and kind of a proof that it worked because what had previously been so difficult, when I used a new approach suddenly became really intuitive and obvious to them.

Mark (09:10):

So if you ran into an IB instructor teacher who teaches IB in their classrooms, what would you say to them if they're interested in the modeling approach, like integrating modeling with their classrooms? How would you advise them?

Urška (09:31):

I mean, I would tell them to just jump in and try it. <laugh>. That tends to be my approach to everything. But I, I, I suppose I would suggest to them that they start... I think mechanics is probably the easiest place to start because that, those materials are really well developed as well. And so they're pretty easy to follow along with. And I think that they would see that if they did that, that it might take, it would definitely take longer than they were used to, but that the payoff would be worth it. It's sort of that idea of go slow to go fast. I have a lot of students who will complain at the beginning or even parents will raise concerns and say, "Well, you know, you seem to be going really slowly." But I think that when we make that really solid foundation, then it becomes a lot easier to go faster later because we can rely on really good skills.

Mark (10:28):

Do you think there's like challenges that are inherent with integrating modeling and IB approach?

Urška (10:38):

I mean, I think for me the biggest challenge is that there is a tremendous amount of content. And so there's always

a little bit of tension between do I take the time that I really feel like I need to go through a full modeling approach and make sure that my students are really getting this and actually being able to get through the content in the syllabus. And I think every year it's a little bit of a struggle because I'll be teaching something and I think, oh, if we could just spend one more class on this, it would be that much better. And I mean, I think every teacher probably experiences that, but sometimes I worry if I rush through it too fast that maybe that's worse than not having done modeling at all. That hasn't been my experience at this point, but I always feel like I'm teaching up until the very last moment.

Urška (11:28):

So I think there is that inherent tension between using an approach that is inherently slower and getting through all the content that you need to so that the kids can take an exam.

Mark (11:39):

So what do you find the differences in the classroom in an international setting as opposed to in the US?

Urška (11:49):

I haven't actually taught in the US, so I can't really make that comparison.

Mark (11:54):

Oh, interesting. Do you find differences between classrooms in different countries?

Urška (11:59):

Yeah, for sure. I think different, there's different cultural backgrounds, different attitudes towards school. So I was teaching in Brazil for five years before moving to Switzerland. And I think there, the students, there's a better balance of work and life, which sometimes can also mean that your students aren't maybe doing as much work as you would like them to do. But I had some very wonderful and very motivated students, so I don't want to paint them with that brush, but, whereas here I have students actually from all over, really all over, India, Spain, Italy, Ukraine. It's a very international group. And a lot of my students actually have parents who work for the pharmaceutical companies here. So they have a pretty strong science background. And I think just the relationship towards education is a little bit different.

Urška (13:02):

I think it's maybe valued a little bit more. So I have students who will put in more work just inherently without me having to say anything. But I think there's pros and cons to that, actually.

Mark (13:17):

Yeah. So are you teaching in a school that draws all these international students specifically? Or tell me a little bit about the school that you're working with.

Urška (13:27):

So the school that I'm working at now was set up essentially, primarily to cater to the children of international business people who work here. So the big ones would be the pharmaceutical companies like Novartis and Rush that have their headquarters here. And then some of the banks, their banks as well here. And then other variety of other businesses. And so what happens is that you have families who come in and maybe they only stay for three or four years. Some of them stay quite a lot longer and it's hard for them to transition into the Swiss system just for a short period of time because of language and differences in curriculum. And so instead we provide an English language curriculum for them and then we also provide an internationally recognized diploma so that allows them

to study just about anywhere in the world.

Mark (14:21):

Hmm. Interesting. So you mentioned the Swiss system, educational system I assume you're talking about. Yeah. How is it, how is it structured?

Urška (14:32):

Ooh, I'm not sure I'm gonna get all the details right. <laugh> It's, it's quite different, but they have sort of a, I guess an elementary school and I don't remember exactly what age it goes up to, but at some point they split off into different tracks. So some of them will go into a sort of very academic high school track and then you have other tracks that are less academic that can be more vocational. And so to get into the very academic high school track, I think you, I don't know if they take an exam here. I'm not entirely sure about that, but you have to have good grades and you have to maintain high grades to stay in it. So it's quite challenging. So it's really a smaller percentage of the students. So it's a different system than from in the US where pretty much everyone will just go on to high school and there's kind of an expectation that you would finish high school - Yeah.

Urška (15:27):

Regardless of what your path is after that.

Mark (15:30):

So the school you're working in, is it a part of that system or is it more what we would describe as a private school?

Urška (15:36):

It's a private school.

Mark (15:39):

And you're happy working there, I assume? Yes. <laugh> Okay. That's good. So, you're a modeler set in a country other than the US and, and modeling has a lot of promotion here and the workshops are all here and that kind of stuff. What is promotion like in the international community? Do you have a sense of - how modeling is being promoted and...

Urška (16:07):

Not very much. I don't think it's very well known internationally. I've tried a bit to promote it, but it's, it's hard. I think because you typically only have a few international schools in each country, it means that the schools are quite spread out. So whereas maybe in the US you could offer training for a school district... Well, if you're outside of the US, you're kind of looking at getting a much, much bigger - region. The other thing is that a lot of professional development money also has to go towards training teachers to teach the IB because they require you to take workshops regularly. It's a nice <laugh> money making scheme from them, I think. Mm-hmm. And so I think in the end, you end up with a lot of teachers, with schools spending all of their money to do that or to bring in consultants that can speak to a much bigger part of the school.

Urška (17:07):

So you might have someone who comes in and is an expert in just general inquiry or, I don't know, whatever the topic is, rather than having someone who's going to come in and just train a very small number of your teachers. I think it's harder for schools to justify that kind of an expense.

Urška (17:22):

So my experience is that very few people know about modeling, at least within the international school community.

Mark (17:30):

Would you have suggestions for the AMTA on how they might do a better job or increase their ability to - <laugh> If I,

Urška (17:39):

If I had the answer to that question <laugh>. I've been trying. I mean, and we have, this year we started trying to offer some distance learning programs that were in better time zones. Unfortunately we didn't get anyone to sign up, but we'll try again. So we'll hope to get the word out there. Yeah. Um, you know -

Mark (18:01):

That's, you're, I forgot, you're involved with the AMTA board. Is that correct?

Urška (18:07):

I am. Yeah.

Mark (18:08):

You're a board member?

Urška (18:09):

I am a board member.

Mark (18:10):

Okay. And has that been a helpful thing for you?

Urška (18:13):

I found it a really interesting experience. Yeah.

Mark (18:17):

Okay. Interesting can mean a lot of different things. <laugh>

Urška (18:21):

I think it's been a lot more work than I was expecting it to be, but I care a lot about this community, so it's really nice to try and give back in some way. And I think also to be able to give a perspective. You know, for obvious reasons, I think the AMTA has been primarily focused on what's going on in the US. And so I think I can offer a different perspective. And a lot, there's a lot of teachers out there who hopefully will one day be trained to also become modelers. And so I think we're still trying to figure out how to get to them.

Mark (18:56):

Yeah. I think it's really cool that you're on the board and that you bring that perspective. That's really neat. You know, that's a very cool thing. So if someone was listening to our conversation and they go, "Hmm, I wanna find out more about this modeling thing," what would you say to encourage them to do so and why? Why would you tell them it would be a reason to, to pursue understanding more about modeling?

Urška (19:24):

I think I would encourage them if they could, to sign up for a workshop. I think it's really hard to do modeling without having some training first. I mean, I think you can go online and become a member and look at the curricular material, but it's hard to understand that even though I think there's pretty good teacher notes. But I think having the training will help you understand it better.

Mark (19:48):

Mm-hmm. Why should somebody pursue modeling? I mean, I'm a teacher. Why do I need modeling?

Urška (19:55):

Because your students are going to enjoy class a lot more and they are going to become much better scientists. Hmm. I think for me, that's the big thing. I think when students learn science by doing science, it becomes something real for them. I think it's also really empowering for students. I think so much of school is based around this idea of the teacher has the answer and the student is trying to get the right answer. And class is all about who can get the right answer, right? Raise your hand and can you answer the question correctly? And can you give the right answer on a test? And modeling really takes the focus away from that. It's a lot more about thinking, learning how to think, and how to become an independent thinker and a critical thinker. And I think it's so empowering for students when they realize that they can ask really good questions and that they can figure things out on their own and they don't actually need a teacher there to figure that stuff out for themselves.

Urška (21:02):

And it's hard at first and they can be really resistant because you've completely flipped the rules of the game on them, you know? Especially sometimes the really good students will get kind of upset initially because they're all raising their hands and trying to give you the right answer and you're going, "No, I don't wanna hear that. Like that, that's, that's not what I'm interested in right now at all." <laugh> But I think sometimes the students who haven't done well in science and instead you' saying, "Hey, that was a really good question that you asked." They can feel like they really have something to add to the classroom. And so I think that's just such a wonderful thing when you start to see your students view themselves as scientists and figure stuff out on their own and not just look to you to say, "Hey, did I get it right?

Urška (21:45):

Was this the right answer?" Without actually having that evaluation of is what I'm saying, does that make any sense? And I think especially right now when scientific literacy is so, so important, because there's so much misinformation out there, we need students who can think.

Mark (22:02):

Yeah. I've heard my wife say that she feels like her role is to teach students how to learn.

Urška (22:11):

Mm-hmm. Exactly.

Mark (22:15):

So what would be your best teaching or modeling tip, if you were to give - you know, some suggestions and tips to other teachers, what would you say would be most important to you in your mind?

Urška (22:33):

I think my biggest one is just don't be afraid to fail. I've met so many teachers who are so scared to try new things

because they don't know how it's gonna work. Hmm. And I think especially when you're trying something new, especially like modeling, it can kind of feel like a disaster initially or a mess, you know, you're, especially if you were the kind of teacher who was used to having every minute of class programmed, you're letting yourself in for a level of chaos and unpredictability and that's okay, you know. It might not always work, but don't be afraid of the unknown. I think one thing that's really helped me in my own teaching career is that I've never been afraid to try things. So even before I started modeling and I started reading about other things or, I don't know, got to some professional development and someone would say, "Oh, here's a new idea." I've always tried it out in the classroom and I've not had a fear of it not working because nothing that you do in the classroom is ever perfect.

Urška (23:35):

And I think the important thing is you do it and then you walk away from it and you say, "Okay, maybe it worked really well or maybe it sort of worked, but there's some things I need to tweak and I'll try it again." And sometimes, you know, you know what, that was terrible and I'm never gonna do it again. And that's okay too because you learn something about yourself. And I think it's also good to be honest with kids about that. Sometimes I try something new and I ask them how they feel about it. And I think it's good for them to see that I'm constantly trying to change what I do and that sometimes I fail because I think being able to fail is a really important skill and it's really good for students to see that as well.

Mark (24:14):

That's really good information. When you're teaching with students from many different, uh, international backgrounds. Languages would be one of the things that you have to deal with all the time. Yeah. Do you teach in English or do you teach -- how do you deal with language in the classroom?

Urška (24:36):

That's an interesting one. I do teach in English, and I've had very varying levels of English in my class and I think that can be a challenge in a modeling classroom because obviously so much of it is discussion based. I think there's things that you can do to help students in that case, you know, simple things like giving them sentence stems so that they have more of a structure when they're participating in a discussion, would be one that I would, that I've done. But I think modeling also helps those students a lot because of that, well, one, there's the whole idea of using multiple representations, so that's really good for students who are not native English speakers or who might still be struggling because then they do have all these different representations to latch onto. And then the idea, right, of idea first and then name is really good actually for developing science vocabulary.

Urška (25:36):

...Which I think actually flips a little bit on the head the way a lot of people do it. I've seen a lot of advice of you should pre-feed kids vocabulary. But I don't actually think that works very well because I think a whole long list of words out of context, especially science words isn't very useful. So I think it's actually a lot more helpful when they develop the idea first and then you can feed them the word and then it's actually a much more natural way of learning those vocabulary. But actually when I was teaching in Brazil, because you talked about whether or not I, I taught in English, I did technically teach in English, but because most of my students, let's say 95% of them were Brazilian, it was interesting because they kept on wanting to, they would switch back into Portuguese all the time in class.

Urška (26:24):

And it was, I was constantly having to remind them, no, you need to switch back into English even if I can understand you because you need to know how to actually say these things in English. And when they would really get into the discussion, sometimes the conversation would just very quickly switch into Portuguese because they wanted to be able to just say what they wanted to say. So - Yeah. That, that was kind of an interesting challenge there.

Mark (26:49):

Yeah. Very interesting. How many languages do you speak?

Urška (26:54):

I speak six.

Mark (26:56):

Really? Yeah. What, what are they?

Urška (27:00):

Well, English obviously, Slovenian, which is my mother tongue, German, French, Russian and Portuguese. That's six, I think. Yeah.

Mark (27:13):

Wow. I've always thought Portuguese was a beautiful language.

Urška (27:18):

I do. I really like it too, but only the Brazilian Portuguese. Oh. Hopefully no Portuguese, Portuguese speakers hear me say that, but I really, I really love Brazil. It is different. Yeah. The pronunciation is different and some of the grammar is different, so.

Mark (27:34):

Huh. Interesting. I didn't know that.

Urška (27:36):

I don't think I really knew that too until I went to Brazil. <laugh>

Mark (27:39):

So gosh, you know, if you speak three languages, you're trilingual. If you speak two, you're Duolingo. What's six?

Urška (27:50):

Mm, I think, I think that's when you just switched to multilingual. <laugh>

Mark (27:53):

Yeah, multilingual. Okay. And if you only speak one language, you know what, that you're called? American. <laugh>

Urška (28:03):

I wasn't going to say it.

Mark (28:05):

That's my language too. And I am one of those. Well, gosh, it has been really fun talking with you and, I appreciate the work that you're doing over there and the work that you're contributing to with the AMTA and your involvement there. Thank you. That's really awesome. And so I just wanna say thank you. And I hope that, perhaps we'll run into each other again sometime. Yeah. Thank you. Maybe if I'm in Switzerland. <laugh>

Urška (28:37):

Of course. If you're in Switzerland, let me know. Yeah.

Mark (28:40):

Or if you're in California, so...

Urška (28:43):

Might be more likely. <laugh>

Mark (28:45):

My wife did tell me to say hello to you, by the way. Oh. So -

Urška (28:49):

I say hello as well. <laugh>

Mark (28:51):

Yeah. Thanks again for being here and doing this with me.

Urška (28:54):

Oh, thank you for having me.

Mark (28:56):

Hope you have a great rest of your week.

Urška (28:59):

Thanks. You too.