Highest Aspirations Podcast: S4/E2
Routines for Reasoning: English Learners and Math with Grace Kelemanik and Amy Lucenta (Part 2)

Steve:
So, I've said many times that I am not a math expert. I spent my entire career basically in language education. But reading the book I was really delighted to see so much crossover when it comes to academic language in English learners.

And one of the most prominent overarching connections I noticed was your argument, we talked about it briefly before, that good instruction for English learners and students with learning disabilities is good for all students.

So, this is like a huge topic and what we've talked about before, but I'd love to hear one or two more, because I think we've alluded to it or specific compelling reasons why you think this is the case.

Grace:
Yeah. So, I think that speaking to this shift of needing kids to learn how to think and reason mathematically. So, if you look at in our field that's the National Council of Teachers of Mathematics and what we know to be good instruction is instruction that has kids working on meaty math problems, right?

Like problems that you put in front of them that they don't yet know how to solve, they don't immediately know what to do with, like positioning them to think and reason. And positioning them to make sense of something collaboratively. So, with that collaborative sense-making, which means kids need to be talking with each other and working with each other.

Steve:
Right.

Grace:
So, we're increasing the discourse in the classroom, right? So, there are a lot of students who they kind of know the mathematics and "Can get the answer" but have a tough time explaining their thinking and what they did.

Steve:
Right? Yeah, I know that. Yeah.

Grace:
With English speakers, right? So like, Oh, I did it in my head. I have the answer. But in the world in which they live, they're going to need to communicate how they're thinking about something and create an argument. And that's very language based.

So, for a different purpose maybe, they're also working on language and communicating mathematically with mathematical language and precision in their language. And which is something they're working on. And an English learner is doing that also with the additional load of a lot of the words, and phrases are unfamiliar and they're trying to begin to just learn the vocabulary and the phrases.

Steve:
Right. And they're doing it all collaboratively.

Grace:
Right. And so, everyone needs to be repeating and rephrasing. We make sense of the word by talking through it. Like do you talk to yourself ever?

Steve:
Yeah. In my head.

Grace:
Is there anything? In your head?

Steve:
Yeah.

Grace:
Yeah. I talk out loud to myself when I'm doing something hard. We talk to ourselves and, we often talk out loud, it's harder [crosstalk 00:05:40]

Steve:
I didn't know if it was a trick question.

Grace:
Oh no, not a trick question. Are you crazy? It's not a trick question at all. We as humans do it, most of us do it because it helps us process. And so, all we're doing is saying provide kids opportunity to be doing that talking. But give them a partner to talk with and then hear another idea back and forth and go back and forth. Not sure I specifically answered your question and maybe you could do a better job than that.

Amy:
I think you did that really what's good for English learners is reflective of how students need to be learning now given the world they're in. And I always worry when we say that, that it's all the teaching that it is. It's super critical for some students.

Steve:
Yeah. I'll let you off the hook Amy too, because I think, I feel like Grace did a good job explaining that. I mean, the big thing is that the students are given the opportunity to make sense of their world as you were saying Grace. And I think that that's a crucial part of being able to understand not only new language and new concepts in math, but also understanding the new environment that they may find themselves in. Like we were talking about earlier.

I mean, you're creating relationships, you're collaborating, that's all. Those are all essential skills in the future. I mean, take the math completely out of the picture. And that's useful. And then with the math itself, obviously it's giving you a chance to process and learn and think about your thinking, which is crucial as well.

And that kind of leads me to the idea that you got to it in the first chapter of the book, which is about taking in an asset based approach. And that's another theme that comes up in almost every episode that we do of this podcast.

It's one of these things where I feel like I'm constantly preaching to the choir, because we talk about taking an asset based approach and the people who are listening to this podcast are generally already doing that or learning how to do that, or trying to do that.

But I think it's different when we're thinking about building learning strengths and focusing on what students can do in math. So, my question is, could you walk us through how a teacher might first kind of find out what assets their English learners bring and what they can do in a math setting?

I think looking at that question and reflecting, was probably one of the most tricky ones in there. So, I'm just curious to see what you'd say to that.

Amy:
Yeah. It's not easy for teachers to really analyze students' assets like that. It takes time and it takes deliberate attempts, but we think the routine support teachers in doing that, because teachers don't have to focus on the next step. As Grace was talking earlier, it frees up their mind to focus on student thinking and engagements during the routine.

And we really need to unveil how kids think, what they're saying, listen to what they're saying, watch how they're making sense of the mathematics around them in relation to their mathematical thinking. And when we do that, we start to see, oh, the student always talks first when they go into a turn and talk.

Maybe it's because they're super verbal and they're ready to just dive in and talk about ideas. Or maybe they're social during class, and maybe they're social because they process verbally.

And that's indicative of a student whose verbal processing is a strength. And so, if it's their strength and let's use their strength to develop their mathematical thinking. And maybe for another student, you notice that even on a written exercise, whether it's a worksheet, homework, an assessment, they do really well on their geometry tasks.

That raises a question like, maybe their visual spatial processing is really strong. So, let's see how that plays out. And if that's the case, we can use those strengths and build on them and use them to our advantage. So, work from with a visual in order to develop a more abstract idea. But it takes some purposeful unveiling of the student thinking to access that.

Steve:
Yeah. And I'm not going to sit here and say that using the routines is going to completely allow you to free up all the time so that you can get to know your student's assets better. But I do completely see going back to the car metaphor, how taking away a little bit of the load that you would be carrying when thinking about what you're going to do next in a class as a teacher allows you to pay more attention to your students, understand how they think, who they are.

And more importantly with this particular question with English learners, what they can bring to the table. Instead of if you're constantly frazzled and thinking about what you're going to do next and you're overwhelmed, boy, I mean, it's really, really difficult to serve those students. And they can and do unfortunately fall through the cracks.

Amy:
Yeah. That's our fear. Right?

Steve:
Right. All right, well another key, another big thing topic as well that I want to address, and it's funny because like I'm not addressing all the main points, but there is a lens of math which I think is really, really interesting. Is this idea of rigor and productive struggle.

I've heard the word rigor more in the last two to three years, I feel like and I did in my entire teaching career. And to be honest, I'm not sure I'm in love with the word, but I think everybody knows what it means. So, I'm going to use it. But that idea of rigor and productive struggle is something that we've covered a lot and is really kind of popular these days.

So, in the book you state that when language is a challenge, a default instructional approach is to show and have the students replicate. This is effective, I'm sorry, this is effective for building skills, but fall short on the goal of conceptual understanding and language production.

So, how do we get past repetition to reach what you call another expression there really like a harmony of concept and language?

Grace:
Yeah. Like showing students how to do something and then having them do what you've just shown them to do.

Steve:
Yeah. Like that. I just love that expression, the harmony of concept and language. So, well, I'm going to let you kind of, you wrote it and so you got to... I don't want to put ideas in your head.

Grace:
Sure. So, language and mathematics, like the content and the language, the content and the language is completely intertwined. Like you can't do or even think about math without using language.

Steve:
Rght.

Grace:
Right?

Steve:
They're just woven together so that you can't separate them. So, the idea is, let's stick with the car metaphor. Let's make our car not be an automatic but a manual. And for the younger folks listening, that's the car with the three pedals on the floor, the gas, the brake, and that extra one.

The one that's more fun to drive.

Grace:
The one that's more fun to drive. Right, exactly. It's sort of this notion of the clutch and the gas. When you're learning how to drive a standard, you push the clutch in and then you ease off the clutch in and then you press on the gas. And there's a point at which you have engagement and the car moves forward. Right?

And so, there's like the math and the language going on in a classroom. And if you push too much for language work and precision in language before there's understanding of the concept, students stall, right? And you have to find that balance as this constant balance between, it's not... this is like when to push on the language. And that has to do with the load of what you're doing.

All of this work is really based in what it means to teach mathematical thinking and reasoning. And that's quite different from teaching a specific skill, like modeling a specific procedure or a

skill and showing it, and explaining it super clearly, and showing it several times and walking students through it and then having them practice that skill.

That's a very different thing than positioning kids to make sense of this context or problem they've never seen before and think about how they might go about approaching it in lots of different ways. The thinking is, and the reasoning has carried a huge cognitive load. And so, you really have to balance the language with that.

Amy:
Grace, when you're talking about this, it reminds me of a video we have of one of our routines in the classroom. And the teacher is less focused on developing structural thinking, and a student goes to share their thinking and to set the stage for the listeners. They're looking at a visual pattern, a bunch of squares put together in a pattern, for lack of a better word.

And the student goes to describe how they're going to count the squares efficiently using shortcut based on mathematical structure. So, they go to describe it and she starts by saying the triangles. And it wasn't a stall, because the teacher didn't correct her, her classmates didn't correct her. She used the incorrect word for rectangle, but she was so focused on her thinking and all of her cognitive load was going to her mathematical thinking.

And so, the word triangle was irrelevant. She meant the shapes that are all the same up there. We all know they're rectangles, but she said the wrong word. And because the teacher was focused on the mathematical thinking, the teacher didn't stop the student, and the student was allowed to develop that mathematical thinking and share it.

And it's a really a sharp example of the distinction between focusing on thinking and language and the gas in the clutch.

Grace:
Yeah. And I think to draw another parallel in ELL, in writing, students write many drafts of something. And I think the parallel in math class is classroom discourse. That's like rough draft thinking in the math classroom. We can't expect and we don't want to force students that every time words come out of their mouth that they have to be mathematically perfect like final draft form.

And in a math classroom where kids are discussing, and talking about their ideas, it's all done in rough draft. And that language is being used, gets more and more precise as the ideas get clearer and clearer. It's like expecting kids to sit down and start writing an essay and not make any punctuation, grammar, spelling mistakes while they're writing. They've got to get the ideas out first and work through the ideas.

Steve:

Right. That's great. I mean, those are great examples and the extension, I loved the car metaphor at the beginning, but I love it even more now because I can just see how it can be extended. And if you don't know about standard vehicles and the clutch and the gas issue, checkin it out so you understand what we're talking about.

But I mean, from what I've read and from our conversation that we've had just over the last half an hour or so, it seems to me that all of the math practices and all of what we're talking about certainly, it's related to language rich discourse.

So, I want to kind of get down to, now, this is a podcast, it's audio. So, it's hard to kind of see, but could you paint a picture of what a language rich math classroom looks like? And might sound like? And again that we'll link to videos that will do a really good job with this, but just for the purposes of the listener who kind of wants to get an image of what this looks like, could you break that down?

Amy:
Yeah, I mean, the reason why the math practices are so tightly connected to language rich discourse is exactly what Grace was saying that we can't really... we just can't think without language. And so, for developing thinking we need the language to do it. So, when you walk into a math classroom that is language rich.

You asked what it sounds like? There is sound, and for more than one student. So, what it's not is the teacher at the front of the room having a conversation back and forth with one student, it sounds like maybe a teacher posing a question and every student in the room turning and talking at once, which can be loud and feel different than a traditional classroom.

A language rich math classroom has residue around the room that supports language both receptive and productive language. So, you'll see around the room visuals, and colors, and annotation. And you'll also see around the room sentence frames and starters.

You'll see supports for students. You'll hear students using those sentence frames and starters. You might see vocabulary around the room, but it's always connected to the work students are doing. So it's not a vocabulary board. There may be vocabulary words attached to work that's been discussed. And in a full group discussion. Again, it's more than one student participating.

Now, Grace, you're going to have to correct me on the statistics on this. I might butcher it, but a colleague of ours shared this study with us where they followed around English learners for an entire week in a high school setting. And they tracked not how often the students spoke, but how many minutes the student had an opportunity to speak. And their data showed students had, this is where it gets sketchy. Seven minutes please?

Grace:
Yeah. Seven minutes.

Amy:
Seven minutes total out of a week of school.

Steve:
Yeah, we too, that reminds me of a podcast episode we did relatively recently with Ivannia Soto who wrote the book ELL Shadowing as a Catalyst for Change. And she talks about the power of shadowing English learners. And one of the things that she mentioned is the lack of opportunity for students to speak.

So, I'm glad you mentioned that. And it's funny, as you're speaking, I'm picturing the class that you're describing which to sort of a traditionalist perhaps like an old school principal or evaluator who might come in and be like, "What does this chaos like?" It reminds me of what my Spanish class was like on the best days. Right?

And I was lucky enough to have an administration and leaders who would come in really process what was going on. Ask me questions and understand that yes, this is in fact it's messy. It's a little chaotic, it's kind of loud. That's just how it is.

And so it's just again, that overlap is what, my takeaway from this entire experience of me looking at your book and getting prepared for this conversation is, I hope others really kind of are taking that in as well, because I think it's crucial for the audience that were concerned with English learners.

That sort of kind of chaotic nature of conversation and just working things out. It's messy, and it's supposed to be messy. So, that's just really nice to hear.

Amy:
Yeah. And that messiness is exactly why we need-

Steve:
Structure.

Amy:
... the support to focus, yeah. To focus the language, to focus the conversation, to keep that mathematical thinking goal in front and center all the way through, because it does get messy in the mean time.

Steve:
Yeah. It's the classic I mentioned earlier, the classic structure and agency, you just can't have one without the other and be successful. So, I think that's crucial. Well, one point of clarification,

you both have mentioned, have you used the word residue a few times? I just want to make sure. I think I know what you mean by that, but just for our listeners who maybe a little confused. What do you mean by residue?

Amy:
Yeah, residues. We sometimes create our own language and forget that we need to define-

Steve:
That's what I mean.

Amy:
... it for folks, but residue is a residual. It is exactly that there's a conversation that happens but it doesn't just disappear. That we create residue as we go through. And so, we're actually old school in that we love chart paper, because when you have a discussion all hands on deck around chart paper and you mark it up, it lasts.

One of our concerns about technology, although we love technology, things like smart boards, you can annotate on a smart board, you can layer in color, and labels, and vocabulary, and then you switch to the next screen and that's all gone.

Steve:
unless you're recording it. You have to be really deliberate about that. I've fell into that trap where I had a smart board. It was like the coolest thing ever and I felt like I was great at it and this was awesome. And then a student asked me, "Hey, can I get all that stuff that you did the other day?" And I'm like, "No you can't" but I learned my lesson and I began recording it. And then it becomes a really powerful tool. But I also am a huge fan of chart paper.

Amy:
It is a valuable tool if you record it. However, in the class lesson itself, in the lesson, if you switch to the next screen, even if it's recorded, students are long [crosstalk 00:23:46] and so, if it's on chart paper and you just move it to the side, students still have it to reference. So, if you kick out some language, say you look at a task and start with generating some noticings about the task.

If you record those noticings on a smart board, you're creating some residue. But it's short term residue, because you turn the page. If you create it somewhere that it's lasting. So, students have it to reference throughout the lesson, then it's valuable residue for them during that lesson and beyond.

Steve:
Yeah. Great points. Okay. Couple more questions. And this one we're getting to the part where I play devil's advocate a little bit, which I like to do a little tension is always nice. So, we talked a lot about metacognition and developing thinking rather than getting the answer. Which I am a full, huge fan of. I think it's great and I think most of the listeners believe that as well.

However, there are teachers out there, there are educators out there who have a hard time with that and honestly they don't want to do it, but they've done things a certain way for a long time.

So, my first question is how do you get this or how do we collectively get this concept across to teachers and students who may not be familiar with anything besides getting the right answer. Because I experienced that in lots of different contexts.

I experienced it in context where I had students, who I had lots of English learners, I had lots of students who came from sort of difficult backgrounds. And then I experienced it when I was working in schools that are really "Academically high performing" where students were just only concerned about the grades. It's not just the teachers, it's the students as well.

So the first question is how do we get that concept across? And then the second part of the question is how does this all play out in the face of these high stakes exams that all students need to do?

Grace:
Yeah, great questions. Because we're trying to make the case for really shifting the way, shifting a bunch of the focus during mathematics-

Steve:
It's a huge change.

Grace:
... classroom, yeah, it's a huge change. And I think you can try to make the case with, well, our kids are growing up in a world that's different. And so, we need to prepare them for that. I think one of the things we often say is, students think the whole purpose of this lesson is to get the answer. If you walk out of math class and all you know is that the answer to the question is 47, that's not usable tomorrow or the next day or beyond.

You have to walk out of math class with more than knowing what the answer was. And so, we're trying to shift from not focusing so much on the answer and the steps you took, but the real question is how did you even know to do what you did? To get that answer.

And that's where we're back to the same thing. I need to know when I look at this problem, how to make sense of it, how to think about approaching it and what to do if I get stuck.

And so, I think it's stopping to think about in math class, if I'm a student, why am I being asked to do this problem? What is it that I'm supposed to be learning from it? If I'm not being asked to do it just to get the answer. There's something in theory, I'm learning by doing this problem.

Now, having said that, there are hard times where kids are learning straightforward procedures, whether it's how to multiply two numbers or how to simplify an equation, or how to graph a line.

Those are procedures and by getting the correct answer that we then sort of have some assessment that, oh, I know how to do that thing.

But to the extent to which the thing we're being asked to do is to solve a problem that might have many different ways to go about solving it, or defend whether or not our answer is right. Then we have to focus on the thinking and reasoning.

And often teachers will look at the test results from high-stake tests, and they'll look at the questions where lots of students struggled. And they'll say, "Oh well, you know what? It was just written hard. It was my students couldn't read that. There was a lot of language there and that's why they couldn't do it."

And when you look at test results, typically the questions that are really straightforward, computation are the ones kids do really well on, and the questions that stymied them are the ones that require the more thinking and reasoning.

And so, I think rather than taking a question that had multiple parts to it and trying to break it down into little teeny bits, what we're arguing is, jump into the messiness of the thinking and reasoning and build these ways of reasoning like mathematicians, reasoning about quantities, thinking about repetition, reasoning through mathematical structure because then you can approach a wide range of problems.

Amy:
I think we were just overlapping in the same thought Grace. And we're starting to see some evidence and compelling evidence that teaching the math practices increases kids' capacity to approach problems they've never seen before.

So, we're starting to see results of this and getting some soft data around it, even knowing that it's really hard to attribute research and education to one aspect, but when we work with groups of students, we see that when we explicitly build structural thinking that is, they know how to interpret an expression or an equation by looking at its parts, by chunking it, by interpreting operations before they start diving in and calculating on it.

That then when they look at equations they've never seen before, maybe ones involving trig functions and they've never seen trig functions. They interpret it and are able to solve it correctly. We have and... yeah, it's compelling.

Another situation where students actually have the opportunity to take a standardized test as they go through the year, and they were algebra one students. And algebra one it has a very predictable trajectory in that the beginning of the year sits in linear equations, linear relationships, and it advances later in the year to quadratics.

So, that's really oversimplified. But the teacher knew the students were going to go sit for this exam and they hadn't seen content yet, but it was going to give the teacher some valuable information about the content they had studied. And this teacher had actually been focusing on the standards for mathematical practice all fall and into the winter.

So, the first half of the year, and he got the results back from the standardized tests that he expected. Students would really struggle on stuff they had never seen before and they were getting questions right that he didn't think they'd be able to have success with.

And the only thing he could attribute it to was his focus on structural thinking through these routines, and making what kids pay attention to, what they ask themselves, the aspects of structure that are important, making all that explicit so they could apply it again. So, that's compelling. We're starting to see it.

Another group of teachers really focused on quantitative reasoning and saw internal gains, not on standardized tests, but on the data they collected over the year. And those students were in a co-taught classroom, at least half of them were on AIPs.

And they saw a market difference in focusing on quantitative reasoning that students independently were approaching a problem and listing out quantities, things they could come to measure before they dove in and tried to solve it.

So, it's definitely gaining traction and we're getting these anecdotal research, I don't want to call them research, but we're getting anecdotes of successes, and that we're seeing this on exams. And that's compelling for teachers as well.

Steve:
Yeah. We're sort of exploring math and English learners a lot more seriously as a company and as an organization now. And so, I've had the opportunity to sit with colleagues and look at some of the standardized tests questions that come out that are for everyone and the ones that are specifically for English learners, et cetera.

And my colleague mentioned something I thought as really compelling. Like, oh, it's like a perfect storm for the need of really making sure that we're teaching the right kind of academic vocabulary and really giving the students the tools they need.

Many of which you've described through the routines, so that they can handle these kinds of questions which are very wordy, and that they contain a lot of vocabulary that needs to be focused on unless you're imagining. They really require the student to be able to think about their own thinking and sort of use some of the problem solving strategies they tried and tested before to get the job done.

So, I think we're in a really interesting time right now where both from the bottom up and from the top down, we're starting to see things kind of overlap and perhaps that will kind of address some of the concerns that I've always had about how do we get teachers and students to kind of buy in to this new and I in my opinion and probably yours, more productive way of learning math and really every subject

Amy:
Well, we had a student actually reflect on experiences in these instructional routines and the focus on mathematical thinking. And we actually had gone into their classroom for a bunch of days and engage the students in their routines.

And at the end, she gave us some valuable information about her reflection on the experiences. And then she said that "I really wish you had come in before we took our standardized tests." That was pretty powerful as well.

Steve:
Yeah, we've heard things like that as well when we piloted certain things to students, So, one particular student said, "You know what? Why didn't we just teach it this way the first time?" It's very similar, sort of in terms of teaching that keeping academic vocabulary and conversations and thought certainly not to the extent that you're doing it, but keeping it top of mind.

So, let's move on to just a couple general questions and then we'll wrap it up. We ask everyone who comes on the podcast if there's a book or other resource that's had sort of a profound influence on them professionally or personally.

And we always sort of curate all those. And every year we release our 10 must reads. So, I'm curious if there's a book or resource that you both might recommend to listeners.

Grace:
Sure. I said, do we have to just say one?

Steve:
You can do two if you want it. I know there's a lot or all readers or all academics, but yeah, try to keep it one or two. Right?

Grace:
So, I think I'll start with an old [inaudible 00:35:15] back in the 90s, a book called Fostering Algebraic Thinking by Mark Driscoll. The reason that was so influential in our thinking is, he was one of the first people to take a stab at what mathematical thinking looks like.

And this particular book takes a look at what algebraic thinking looks like. What are students, what are the habits of mind that you develop when you're working in the field of algebra? What do you pay attention to? What are the questions you ask yourself?

Steve:
You can see why I liked that book.

Grace:
Yeah. And to be truthful, when the standards for mathematical practice came out, we used his sort of his framework and approach for algebraic thinking, and we brought that to the standards for mathematical practice. And pulled out of the math practice standards. Those three avenues of thinking, reasoning quantitatively, reasoning structurally and reasoning through repetition. So, that had a huge influence on our work.

Amy:
Yeah. So, one only one-

Grace:
I know it's hard.

Amy:
Well, I'm going to marry two together then.

Steve:
Okay.

Amy:
Okay. Years ago I remember hearing about this quasar project and the levels of cognitive demand. And I heard about them solely in a math content lens. That we can look at a math task and see whether it's actually causing kids to think and reason.

And then I heard about it again and read about it in the implementing standards-based math instruction, it was a case book for professional development. But in reading about the study, and hearing that when we engage students in higher demand tasks, learning gains are greater. And not just some students, but all students.

And I remember being really moved by this like, wait a minute, we're not engaging all students in high demand tasks, and we're not engaging them in the kind of thinking and reasoning. Grace just talked about in the Fostering Algebraic Thinking.

For some students we're keeping our demands low with good intention and it really was pivotal for me to be thinking about all learners in each and every student having access to develop thinking and reasoning, and I'm not holding some students from that opportunity.

And then, Grace and I were both heavily influenced by Ohad Moskowitz's work and understanding language in Sanford and then collecting what it takes to teach and learn mathematical thinking for English learners. That was a seminar work as well.

Steve:
Great. Yeah, I've just started to kind of look a little bit at some of that work as well, so I'm glad you mentioned that. Well, that's great. So, we have a few books that folks can follow up on and how can people learn more about the work that you're doing? We mentioned the book Routines for Reasoning. What else would you recommend to people look at to find out what you're doing?

Amy:
Well, Grace and I do our best to maintain our website, which is @fosteringmathpractices.com and we put as best we're able, we put some current thinking up there, we put where we'll be and the kinds of sessions we're doing with folks. So, that's really our portal for sharing the work we're doing.

We're always learning at the national conferences at NCTM, National Council of Teachers of Mathematics and NCSM national... actually they don't call themselves that anymore, but National Council of Supervisors in Mathematics. They have an annual conference every year and they always have equity strands so we're always there as well. Working and learning. Grace, where else would you recommend people could find out more?

Grace:
Well, I think starting at our website's a great place also on the website is all of our routines are posted there with materials to get started with them in PowerPoint sample math task, video that you can see routines in action in the classroom. And of course the routines for reasoning book. And if folks can sit tight a second. I don't know. The next book is coming in 2021 we're in the middle of writing it right now.

Steve:
That'll be the next podcast. Mark your calendars for both the book and the one of the books.

Grace:
Oh, we just said that out loud now we have to finish it.

Steve:
I know. Yeah. Right. Well, honestly, this has been, I've really enjoyed speaking with you both. I enjoyed preparing for this, which says a lot. Again, given my experience with math, but I mean, you're really, and I think listeners probably feel the same way. You're really marrying lots of the concepts that we talk about here in Highest Aspirations all the time.

So, I loved being able to structure this conversation around those big topics, but really giving folks a perspective on math and I just really appreciate the work you're doing. I appreciate you

coming on, and really working with us through an English language learner lens, and just very appreciative of this collaboration and hope to do something else in the future.

Grace:
Thank you Steve. Thank you for the opportunity.

Amy:
Yeah. Thanks for shining a light on teaching and learning for ELLs, and thanks for giving us this chance to hang out with you.

Steve:
Absolutely. More to come. Thank you.

Grace:
Take care.

Amy:
Awesome.