The eLearning Coach Podcast
ELC 050: Should you believe it?
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Connie Malamed: Welcome to The eLearning Coach podcast online at theelearningcoach.com. I'm Connie Malamed, bringing you ideas, tips and best practices for success and creating effective learning experiences.

Hello learning people. Did you ever come across a fact about the brain or learning that seemed like it couldn't be true, but then again maybe it was? In this episode, I speak with Clark Quinn, Ph.D. about many of the false beliefs and misunderstandings that he explains in his book, *Millennials, Goldfish and Other Training Misconceptions*.

Clark is a prolific author and a recognized leader in learning technology strategy. Clark has been involved in the design, development and evaluation of a wide variety of educational technology for over 30 years. There are links to many of the people and ideas that Clark mentions in this podcast. You can find the resources and a transcript at theelearningcoach.com/podcast/50.

Here's the interview.

Hi Clark, welcome to The eLearning Coach podcast.

Clark Quinn: Thank you, Connie. Pleasure to be here.

Connie Malamed: You've been researching learning myths and misconceptions in your new book. You've been researching it very intensively I imagine. How prevalent do you think these myths are in the learning and training industry?

Clark Quinn: I think they're all too prevalent. I did a study of the average public and teachers, and I have found there that a surprising amount of the public and even teachers who should know better, and even people with some neuroscience training have it. But, it's still prevalent in our industry as well, so I don't know that we have the clear studies.

All you have to do is walk the Expo Hall and you have the conferences. See ... Talking about claims to neuroscience, lots of ways to study your styles and teach to your styles in Millennials and generations. People are still offering things, people are still spending money on this. It's all too prevalent.

Connie Malamed: Interesting. What kinds of problems do they cause in our industry?

Clark Quinn: I see three major ones, and two are relatively essentially the same. The first one we can be spending time and money on things that aren't going to make a difference. We could and should be paying attention to better research, what

we do know, the learning science, and instead we may be pasting this other stuff on top of what's still bad design. I'm afraid a gilded bad design is still a bad design, but worse.

The thing I worry about more is that some of this stuff can actually lead to worse learning design practices. We may actually be doing bad things to our learners instead of the best things we could. I think it's a distraction. It wastes time, it wastes money, and it keeps us from doing the best we can for our learners.

Connie Malamed: That sounds grim, but that's why we're here because we're going to bust through these myths.

Clark Quinn: Indeed. That's the hope.

Connie Malamed: For starters, can you talk about some of the misconceptions and myths that are floating around regarding different generations?

Clark Quinn: Specifically to millennials, that's in the title of the book actually, but it actually is called Generations inside the book, that's where you find that particular myth. It's been mentioned so often and you look at what the data says, when you separate out all the hype you go in and people have actually studied it.

One of the claims is that millennials have different values about what matters at work. If you get a list of what matters at work, and you ask different generations their beliefs about which ones are most important to them, there's no significant difference. It goes on, and there are better explanations.

One of the things is young people want certifications these days. Well, it turns out that's not because of their generation, it turns out that's because they're young and they don't have experience or anything to point to, so they need certifications to make claims about what they know. Older people complain to the projects they did, right? Oh, I've done that. I did it here, and I did it here.

So, just age makes a far better explanation for that type of thing. It's really a mild form of age discrimination, bucketing people by their generation instead of identify them by their specific characteristics. It makes it easy.

One of the interesting things I found was that people's perceptions ... so you go out and ask employees' perceptions of the generations, they think they see it because it's not really there. Doing thing on that basis is just wrong.

Connie Malamed: Right. I guess that is one of those cognitive biases where you perceive what you think is true.

Clark Quinn: Mm-hmm (affirmative), behind a lot of these myths, there're simplifications that oh well I have this intuitive feeling and this validates it.

Connie Malamed: Right, right. Clark, my understanding that the use of FMRI scans in studies is controversial because some people say that these are not reliable or accurate. What have you found in your research on this?

Clark Quinn: You know what's funny? I hadn't really looked at that, so I looked it up when you mentioned it in preparing. What functional magnetic resonance imaging does in particular is it looks at blood flow. Under different conditions, if you get different blood flow in parts of the brain, they're saying that part of the brain is activated.

One of the complications is maybe several different parts of the brain are activated, but they all share this particular part of the brain so they're all communicating through it and some additional load, so that lights up. But that's not actually the part of the brain that's really worrying.

The nice thing is for most of the miss I'm looking at, that played no role. We had other ways of finding this data. There were two that were potentially effected by FMRI or based on that. One is the gender differences. Can we talk about male brain versus female brain? That wasn't done individually.

That was aggregated in patterns across a number of people. It doesn't matter. It's not trying to say that part of the brain does this, what they say is are the patterns different across people? FMRI can be used for that, I believe. I think it makes perfect sense. So what they found out about female brains is while there are some differences, the variation is more than the differences, so you can't reliably identify a gender of a brain by the patterns, which-

Connie Malamed: Interesting.

Clark Quinn: Largely says it doesn't matter. The other one that could have been potential was hemispheric actions of the brain. In other words, left brain/right brain. Again, they weren't trying to identify any particular part of the brain having a role in a specific thing. They were just looking for the connections between different things. Are there more connections specific to the left brain, or specific to the right brain? Again, they didn't find that reliably. So, it wasn't ... statistically, you can identify somebody's left brain/right brain based upon their connections in their brain, which is largely what the claim is.

Connie Malamed: Mm-hmm (affirmative). In the book how do you define a learning myth?

Clark Quinn: Myths to me are beliefs we have that aren't true, that are probably not true. Let me be clear, there are beliefs we have that we don't have evidence for right now. Let's take learning styles, for instance. There are clearly differences between learners. Everybody sees that, knows that, which is why it's very plausible in those learning steps, learns different. But there are two problems with it.

One is that we can't reliably identify those differences between learners in any specific way. The instruments we have aren't valid, don't retest the same way, they don't pass all the psychometric validity tests that does this not the same as something else, or are we truly separating it out, and can we re-test it, and does it address what we think it does. There was one instrument that met all four tests, and it was very not of interest. It was one dimension, basically.

The problem is learners do different in how they learn, but that changes depending on what they're learning, the context they're learning in, their mood right then, how much they care about that particular topic. For all I know it's phase of the moon, too. We have trouble reliably identifying those differences. The second thing is, a separate analysis looked at people who tried to adapt learning to learning skills and found no evidence for that.

We have a better thing. We adapt learning to the type of learning outcome we're trying to achieve. So, that's an example of a belief we have now, which isn't to say we won't at some day in the future be able to reliably identify how learners differ. It just means right now the instruments we have are not sophisticated enough, or not reliable enough, and there's no reason to do anything on that basis anyway as far as we know now.

Connie Malamed: Mm-hmm (affirmative).

Clark Quinn: So these sort of things that people are acting on, right now we have no evidence to do it.

Connie Malamed: Right, I really like your attitude remaining open minded. Something might come along, some research might be granular that may serve as proof for a different theory. But right now, this is where we stand.

Clark Quinn: I appreciate that. But I think that's just good science.

Connie Malamed: Exactly.

Clark Quinn: The best explanation, you know that. We may find a better explanation going forward. We continue to expand ... I've once started ... Science is described as this giant circle, and each individual study, and each individual doctoral thesis is moving a tiny little part of that circle further outward. But gradually as we aggregate this stuff and wrestle with it, our understanding grows.

The politics of it get funny. Somebody who's had a theory and has benefited from it is really resistant to changing it. At the end of the day, our long-term understanding advances, and it gives us the ability to do things like be in two totally different parts of the world and having this conversation.

Connie Malamed: Right, right. You know, I heard someone recently speaking about scientists and saying that a good scientist has loosely-held ideas. If a good scientist theory is proven incorrect, the person may say, "Great, now we're closer to the truth."

Clark Quinn: It would that it were all idealistic. It's not always the case. At least somebody said, "Strong beliefs loosely held."

Connie Malamed: You almost have to when you're talking about research on humans. Humans are just so complex and so varied, it can be tough. I wanted to talk about one of my favorite myths, which the second I saw it I knew it was the most ridiculous thing in the world. And that was that humans have a shorter attention span than a goldfish.

Clark Quinn: Yeah.

Connie Malamed: Why was that all over the Internet, and how did that myth come about? That was the funniest one of all, to me.

Clark Quinn: It is. Different myths have different origin stories. They all tend to share the fact that they make an explanation for something we've observed that makes it simple and easy to understand. The goldfish one is funny. So, it was attributed to Microsoft IBM Canada ... or, Microsoft Canada somehow, and you track it and indeed they had it in a paper, but they were citing another source called Stat Brain, and you go to Stat Brain and you find what they're doing and they found one study that talked about how people's behavior on webpages have changed from a certain period of time to some period of time several years later.

They were spending less time, and less than 10 seconds now, on a page browsing the web. Then they said that was less than the attention span of a goldfish, but nobody has ever been able to find any study as far as I know that talked about what the actual attention span of a goldfish was. Stat Brain put that in as just sort of a marketing hype, as far as I can tell. They haven't admitted to it. I sent them a message asking. I'm not the only person who's tracked this back.

The funny thing is there are alternate explanations, and this is one of the fun things that we do in science is we say what are the rival hypothesis that could explain it, and then we use Occam's Razor, what's the simplest explanation? What they were doing was looking at webpages, but you might spend less time on webpages because webpages now load faster, or because we have more experience with webpages and we can parse them quicker. This has nothing to say about human attention. It turns out human attention is quite complex.

We have some volitional control, but external factors can drag our mind away, the famous cocktail party phenomena. You're in a group of people talking at a party and another group of people is talking over there, and you're paying attention to the group you're talking to, but your name is mentioned in the

other group. Boom. Your attention is over there. "What? What did they say about me?"

Connie Malamed: Right.

Clark Quinn: It's complex. Then you look at alternate examples of our attention. Do you watch movies, or do you play computer games? Is your attention locked in for hours at a time? Absolutely. We have trouble paying attention to the right things if there's a lot of distractions. Our goal as designers is should be to control and minimize extraneous attentional load while we're learning to chunk up our information so that we can manage a higher cognitive load because we've compiled it away.

The whole story about that particular thing, and yet, "Oh, well we see kids playing with their phones and we can't hold their attention at tables anymore," they have more things to be distracted by. But this attention span of a goldfish story makes a simpler explanation then the actual real one, which says we're not doing a good job with helping them manage attention, we are giving them better distractions. We have more choices of what to attend to.

Connie Malamed: Mm-hmm (affirmative). Mm-hmm (affirmative). Speaking of all that, did you come across any studies that showed changes in our brain function from the consistent use or addiction to devices?

Clark Quinn: No.

Connie Malamed: There we go.

Clark Quinn: That was a very beautiful follow-on for the previous one. In fact, I was intending to mention it. Here's the thing, evolution happens over a very long period of time. The notion that our brains would have evolved differently to different neuro architecture is silly. Just no. What we can talk about is what we're learning may be different and even our pedagogy and how we learn, but what works to make our brain change in systematic ways hasn't changed. We still need ... reactivating the patterns and activating them over time in conjunction for those neural links to strengthen.

We talk about neurons that fire together wire together. By the way, that's about all people need to know about neuroscience, and everything else is at the cognitive level and if anybody's telling you differently, they're probably trying to sell you something. No, it's silly to think that our wetware is fundamentally changing the neural structures we have and how it effects it will have changed fundamentally.

Connie Malamed: Right, that all makes perfect sense. One of the myths that you bust is that making mistakes is not useful for learning. Can you talk about that a little bit?

Clark Quinn: Sure. There was this notion of error-free learning that came sort of out of behavioral psychology way back when. Well, if we just gave you the things that were within your grasp when you make a move and it's the right move, we enforce that, we can get you all the way up. That might be possible, but I'm not sure that's the fastest way. Interestingly, a number a years ago Brian Gaines up at the ... I think it was the University of Calgary in Canada, was doing machine learning studies.

With a fairly generic machine learning algorithm, they looked at the ratio of failures to successes in optimally training a network up to a certain level of performance. They found that a 66% failure rate ... I may have the number not exactly right, but it was on that order, for the time failure rate optimized learning. This was machine learning, not human learning. But these networks are arguably somewhat similar, but argues that actually we will learn faster if we do have some failure.

Alternatively, I think it's Roger Shank whose argued that we probably have to fail to learn. Certainly, if we're overconfident to begin with, we won't be open to the effort necessary to change our beliefs unless we actually have some failure. So, we have some randomness in our cognitive architecture. It's evolutionary advantageous so randomly we can try something different and it happens to be better, and over time that gets rewarded and we learn something new.

But most of our mistakes tend to be patterned. They tend to be bringing in mental models. Mental models are really good tools for dealing with the types of problems increased in the organization's face. Whether it's making decisions, we need models to predict the outcomes of each choice of action so that we can pick the best one based upon what we think is going to happen. If the errors we see are patterned, and they come from bringing in the wrong model for what seems like good reasons, it just turns turns out not to be the right model and there's a better one.

The best way to help people recognize the flaws in those models and get them is to have them make those mistakes in the learning experience before it happens in the real world, and make sure that they aren't liable to bring in those wrong models. Errors are powerful tools for learning, and the notion that we shouldn't ever have errors in learning, there's the worry that oh it might hurt people's self-esteem. Yeah, so make it safe, and help them understand how powerful failures are. Errors are valuable for learning.

Connie Malamed: Right, that becomes obvious when you think about your own experiences. If you've made a good mistake, you've really learned from that good mistake, right?

Clark Quinn: Yeah, I'm sure you and I, and everybody else can tell our own story of when I made a really big mistake that I never made again.

Connie Malamed: Exactly, yeah. One more myth I wanted to run by you that I thought was pretty interesting, because I think there might be a bit of a trend in our desire to streamline learning and make it all micro. The whole idea of skipping the knowledge component when we are designing learning experiences. Can you talk about that?

Clark Quinn: I can. I have been somewhat guilty of that myself thinking if you focus on what people need to be able to do, that's going to be the most beneficial to the outcome we need to achieve when you need to change what people can do. It turns out that to do, and I like van Merrienboer's Four Component Instructional Design that kind of makes this clear. They separate things out into just sort of two things: The complex problems you need to solve and the skills you need to solve it, and then the knowledge you need to apply those skills.

Our brains compile knowledge away when we become expert at things. But to start, we need verbal models, and mental models, and sort of explicit information to guide our performance. That knowledge, sometimes it can be external, but sometimes it has to be in our heads to guide our performance as we begin to automate our own abilities. Granted, there's the role of being structured to guide a lot of that, but eventually we have to have our own internal guidance system that helps us continue to self-improve, and that comes with knowledge.

It's not just automating the skills and the ability to make the decision, sometimes it happens ... Kathy Sierra makes a good example in her book, Badass, about chicken sexing. Nobody can articulate what goes into actually picking up a chick and determining whether it's male or female, and the only way to train people to do it is to have them do it again, and again, and get feedback and eventually they'll be able to do it. Nobody has yet been able to articulate it in any way that is transferrable to anybody else.

But that's not true of most stuff. Knowledge does help us accelerate our ability to learn. Just knowledge doesn't do it, but just skill training largely isn't going to do it as fast as it is. What we need to do is be pragmatic. We need to do ... The training we need to do, and then we can't do all the training up until somebody's perfectly capable. There're a few domains we spend that money where lives are on the line: Aviation, medicine, military. By and large, we can't afford to do that, so we need to give people support for going on. That's where that knowledge plays a role. You want to focus on what do the people need to be able to do, but then we need to come in and say what knowledge did they need to have to be able to do that.

Connie Malamed: Yeah, I think it came from the desire to streamline things, but in some instances we've gone overboard and ignored the knowledge component which is kind of like a foundation for performing a skill.

Clark Quinn: Although I have to say that it seems to be more ... the reverse is the problem. They are just doing the knowledge bullet point after bullet point and never getting focus on actually applying it in any meaningful way.

Connie Malamed: That's a really good point. That is a big problem. Let's move on to the part of your book where you're talking about learning superstitions. How do you define that? How's that different than a myth?

Clark Quinn: To me, superstitions differ in two major was. The first thing is they're not necessarily even conscious. They're just practices that we've gotten in the habit of doing without even really knowing why. The other thing is they may not be specifically disprovable. We just have good arguments about why they're not good practices. So, things like believing that knowledge equals skills is a superstition, not really a myth.

The fact that you think bullet points is just the knowledge is sufficient is more superstition. People know that, but they end up too easily just taking the information from the subject matter expert, putting it up on the screen, adding a quiz, and there's a lot of constraints in the environment that make that happen. So people do it, and yet there's not real reason that that's going to lead to any meaningful change. My description, my term, for superstitions are basically those practices we see without really having any justifiable reason for them to exist.

Connie Malamed: One of those that I think is so important is that any type of interaction in an eLearning course will engage someone. For example, click to display.

Clark Quinn: Yeah, or click to see more, which is just a way to cram our content in on the screen and so you get the feeling that you're doing something more. I understand that one, but you're absolutely right. It's just crazy. We have to distinguish between cognitively engaging interactions, and just meaningless interactions. The other one is roll over to see the answer. If you don't commit, if you don't have to exercise your brain and make an explicit choice between alternatives.

Make that choice and then see the feedback, you haven't really process that information in a way that elaborates it in your neural networks essentially strengthening those patterns together. That's the critical thing. We have this knowledge dump approach. We're trying to figure out a way to make it less just content dump. Well, if we add some clicks to spread it out maybe that's going to be sufficient, and it's not. You're absolutely right that we see that, and that is one of the classic revisions that they built into the tools. Click to see more, click to expose this, roll over to see the question.

Connie Malamed: No, I'm not saying that I never used it. In fact, with some of my clients I have been able to talk them into taking away some of the very obtuse, legal content that no one is really interested in. Hide it, and then say if you want to see the

original policy, click here. Then, someone can click and read it, and I'm guessing that zero users do that. It's not that I never use it, it's just that when I am using it, I do not consider it engaging.

Clark Quinn: I think that's absolutely right. They tell you it has to be in there, so you can say it's in there. But it's unlikely that anybody click on it. I will guess, Connie, there's never any assessment that is dependent upon that information that they could click on.

Connie Malamed: Right.

Clark Quinn: Right. So, the stuff that I'm talking about, the click to see more, is not a way to put it away, except for those people who they believe will actually exist who will be curious about that. This is just a way to cram more content in, and that stuff could be in a quiz. That's the problem I'm talking about.

Connie Malamed: That's true. Just to play the devil's advocate here, there is one thing I do that I think would be interesting to hear your opinion. I am thinking that it does help with chunking, with presenting small bits of information at one time, kind of like a progressive reveal. Again, I don't necessarily think it's engaging, but cognitively, I think it is giving people a small drip. Kind of like that drip torture.

Clark Quinn: Right. There is a way to make it meaningful. For instance, if you have an image that's spatial information and then you want to understand how that specific part relates, and you don't want to overload the diagram so you can roll over the click-

Connie Malamed: That's true.

Clark Quinn: And see relations, there you're engaging, again, a cognitive process that says I'm now attaching this information to a spatial relationship, which is a form of elaboration. But that's the key. If it's just click to see more versus click to see more because of X, Y, or Zed, no. But if you are attaching some additional information about where you're clicking to see more, or in some other way click on all the blue things to see what's similar about blue versus red, or some other way that you're discriminating information and adding extra value to it, that's okay.

But just using it to hide more information ... yes, we should break stuff up into small chunks, but if you just chunk it up, but still giving it to them boom, boom, boom, boom, how is that different than just exposing bullet points? There has to be some processing going on in addition to it, or some interaction in between that makes them apply it before you give them the next time.

Connie Malamed: Yeah, and I agree. By adding something that allows people to process it more deeply, that's when you want to do it. It's not engaging by itself. I've actually had, for a medical eLearning client, a few doctors that said to me, "Please don't

make us click on things for more information." Okay, another one that you have in the superstitions portion of the book is the different beliefs, and I guess superstitions that people have, about making learning easy, as you said, so that no one loses their confidence, or making learning so difficult and challenging that people get so frustrated they just shut down.

Clark Quinn: Well, they are both extremes. It turns out the evidence is that you need the right amount of challenge. You can look at Vgotsky's Zone of Proximal Development, and it perfectly aligns from the engagement of Mihaly's concept of flow. If things are too easy they're boring. I could do this with ... Why am I doing this, I can do this. Boom. If it's too challenged, it's like I can't do this. It's frustrating.

Then there's zone in between in the Vgotsky model where the things you can do with one hand tied behind your back and blindfolded, and quite a ways further on, and stuff you can't do no matter how much support. In between is this Zone of Proximal Development where with some support you can do it, and that's where learning happens. That's where you're stretching yourself.

You need some ... I've heard it termed "desirable difficulty" and Erickson in his peep book talks about deliberate practice, just the thing is what you need to focus on now that's a little bit stretched, and is deliberately advancing this part of your understanding. It's that notion of that sweet spot where learning happens optimally. We can address the emotional side as too boring, as we already talked about, make it safe. But if it's too difficult, people will just get frustrated and they'll turn off.

The topic of my first book was engaging learning and how do you meld the emotional side. My statement then, and I still stick by it, is learning can and should be hard fun.

Connie Malamed: Right. It seems like in the future personalized learning, to whatever extent we can make that happen, can help us with that issue because audiences have such a wide range of experiences.

Clark Quinn: Indeed, and that's some of the basis for a lot of the adaptive systems. The simplest thing is just if you have a graded set of practices in terms of in difficulty, and if they're struggling you move them back to something simpler until they have mastered it again. If they're doing well, you can ramp them up ahead forward. People can learn at their own rate. There's a wide variety of factors why that works, but it turns out it does work.

Connie Malamed: Yeah, that's wonderful.

Clark Quinn: Yeah.

Connie Malamed: How did you differentiate a learning misconception as opposed to superstition or myth?

Clark Quinn: These are things ... and there's a lot of them, that aren't obviously wrong. These are the ones that are controversial. Half the people go, "This is the greatest thing ever. Why aren't you doing this?" And the other half are going, "No, this is awful. Why would you invest effort in this?" And it's not provably wrong or right. This is where it comes down in interpretation. The reason some people hate it is for X. The reason some people love is Y. What you have to do is figure out which of those you are.

Does it make sense for you or not, and that's what I've tried to do is take those terms and unpack them and say, "Here's what we're really talking about," and granted in many cases, "This is more my breakdown of it." But I tried to look at why people did find it valuable and plan out what's good about it and why people don't like it, and what's bad about it, and try and make sense of it. There's a large variety of these we're so familiar with Kirk Patrick 70-20-10 problem-based learning. These are things that people disagree about, and what we're trying to do is just give you a way to get and handle on it and figure out if it makes sense for you.

Connie Malamed: That's a really awesome idea. Let's start with 70-20-10 because there's a lot of misunderstanding about that, I think. People always say, "Don't get hung up at all with the numbers." I was wondering if you could explain the concept of 70-20-10. What is a good implementation that you've seen of it in an organization that supports this approach to learning?

Clark Quinn: Right. So it emerges out of research. They asked a number of executives how did you learn to do what you do? When they sorted this out and got rid of all of the things that nobody else could have any involvement in, they found out that formal education played a certain role, coaching and mentoring played a second role, and then your own trial and error, and reflection and learning from what happened played another role.

The numbers weren't perfectly 70-20-10, but about 10% seemed to be informal education, 20% from coaching and mentoring, and 70% just doing it, failing or succeeding, looking at the consequences, and figuring out what happened. So that was the model and they weren't claiming those numbers were exact, but that rough ratio has been reinforced again and again in a bunch of different types of studies the US Department of Labor had 20-80 for formal and informal learning.

Here's where it makes sense, Charles Jennings is arguably the foremost proponent of 70-20-10, and he's got organizations. They found great use just talking about helping executives recognize that we've got to go beyond the cores. That you guys run your training sessions and then you leave people on their own and you're not getting the results you need. This is used to help L&D

departments get funds for investing in coaching support as well, and as well as giving people stretch assignments and tracking those as well.

Now, the people who don't like 70-20-10, the antagonists, say, "Those numbers aren't exact," and we have good scientific design that tells us you need spaced learning, and coaching and stuff. Absolutely true. So 70-20-10 is valuable if you need an argument to convince people about the need to go beyond just the course. It resonates with people who go, "Well how did you learn what you learned to do? Did it all come from a course?" No, and here's the study we asked executives, and it's roughly this.

We need to take advantage of that and build it in. So, organizations that soften up their executive suite to a broader picture of what learning can and should be, and then get resources to do that and get better outcomes. That's the success stories we hear. Organizations already have that on a scientific basis of why need this. They don't need it. So, it's if you need help making an argument.

Now, it's gotten complicated because now Charles has joined up with 70-20-10 Institute, and they have actually turned this into an entire performance consulting process. It's very good, but that's in a sense different than just the original use of the model and that's mostly what I'm trying to worry about in this particular instance, is helping people make sense of it.

Connie Malamed: Sure. Clark, I wanted to thank you for your time, and if you don't mind I have one more question. I wanted to get your recommendations for how people in the field that don't have access to perhaps the academic research journals, how can people conduct due diligence and avoid believing in a myth, a superstition, or a misconception?

Clark Quinn: I'd break it down into about four steps. The first one is cut the claim down to its core. What are they actually saying, and what would I do differently, and what would I expect as a result if this were true? So, first make sure you're very clear on what the claim is.

Then, go back and track backwards. Who's saying it? What legitimacy, what research are they pointing to? And, what's their vested interest? Let's see why they might be saying this.

Then, you really should look at the academic research if you can. If somebody's trying to push this on you, say, "Can you point me to study? Can you provide me the studies that back this up before I take what you're telling me?" Here's where it gets challenging is reading the paper in the original academese and figuring out did they use appropriate subjects so that the results will transfer to the people I'm worried about? Did they have an appropriate methodology? Did they have sufficient subjects to have the power that this is really statistically valid? Did they look at qualitative data with a quantitative method, or vice versa, or did they use appropriate methods? That's where it gets tough.

Finally, at the end there's a sniff test. Does this just make causal sense? That's too often where go wrong with misses. They do seem to answer simplistically, but if it's too good to be true, it is. That's the rigorous way. The shortcut way, if you don't want to go back to the original research and try and interpret it is look to the people who do this well. That includes you, Connie, and it includes Will Thalheimer, Patti Shank, Julie Dirksen. There's a number of people we think of who have looked at this research, translated it into practical applications from practice, and have strong opinions, loosely held, they're willing to abandon them if evidence comes contrary, but right now there's a unified view that what this is, is not valid.

You really do want to triangulate, even back in that previous set of four steps, who all is saying this, and is anybody saying to the contrary.

Connie Malamed: Mm-hmm (affirmative). Mm-hmm (affirmative). I just wanted to say two things. One is that I have noticed that on Google Scholar you can often find a research article that used to be behind a firewall, a paid firewall. Not always, of course, but frequently I will find some research that was alluded to. I'll find the PDF version of it. Secondly, one thing that always concerns me when I do read the research is so often it is done for obvious reasons on university students. That just drives me crazy because I'm always wondering, okay this makes sense. It was so good. What a great idea. But, does this apply to adults in the workplace?

Clark Quinn: You would have to be very clear on that. You're absolutely right, Connie. I have found some studies I can't get access to the whole article, but abstract makes it very clear. Even if you can only see the abstract, sometimes that's the easiest thing and the best thing to read to see what they ultimately converge. In a published article, typically the abstract should tell you what the conclusion is.

Connie Malamed: Right, I see that. Anyway, Clark, I want to thank you so much for your time. It's a great book, and I think it is a good contribution to our industry. I think it will change the way things go, so congratulations.

Clark Quinn: Well, thank you for the opportunity. Always a pleasure to talk to you. Thanks.

Connie Malamed: I hope this episode made you feel better about not having an attention that's shorter than a goldfish. Think of what that can do for your self-esteem. Aside from that, I think the key takeaway here is that we need to stop and consider whether our practices and beliefs about learning are credible. You can find the show notes with links to resources and a transcript at theelearningcoach.com/podcast/50. That's the number 50. I won't be publishing a podcast in August, so I will talk to you again in September. Have a great summer, or winter. Take care.