

Use Data and Analytics to Level Up Your Instructional Design

The eLearning Coach Podcast

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Connie: Welcome to The eLearning Coach podcast, online at the e-learning coach.com. I'm Connie Malamed, bringing you ideas, tips, and best practices for success in creating effective learning experiences. Hello, learning people, and welcome to episode 80 of The eLearning Coach podcast.

I wonder if you hear and read a lot about learning data and analytics but aren't quite sure how to go about gathering the data, interpreting it, and using it. I think this conversation with Megan Torrance will clarify things for you. In this episode, I give Megan a scenario, and she walks through possible ways to collect data and to use it to understand the impact of learning on an organization. Megan is the author of important books in our field, including her latest one, *Data and Analytics for Instructional Designers and Agile for Instructional Designers*.

She is the chief energy officer and founder of Torrance Learning, which helps organizations connect learning strategy to design, development, data, and ultimately performance. She and the Torrance Learning team founded the XAPI learning cohort to help thousands of people get started on their data journey. You can find a transcript and links to resources at theelearningcoach.com/podcasts/80. Now, here's our conversation.

Hi, Megan. Welcome to the E-Learning Coach podcast.

Megan: Hey, Connie. Good to be here.

Connie: Loving your new book. In case anyone doesn't know yet, it is about learning data and analytics. I love the examples in it, find them so helpful. I think most people know, but we probably have some new listeners who may not know this. Can you define learning data and analytics? And why do instruction designers need to know about it?

Megan: Okay. All right. Great question to start with. So, I'm going to pull things apart a little bit. So, learning data is bits of things that we measure, right? Data is what we measure. And the learning space can be around the learning experience, around the learners, around the outcome, around the learning platform. There are all sorts of things. So, we're talking about

learning data. We're talking about bits that we capture about what's going on in that holistic learning space. And when we put some context around it, we get to move from data to information. When we get to see patterns and things that we learn from it, we call that knowledge. And then when we have experience and insight, we call that wisdom. I'm not going to collect a completion score and call that wisdom, right? That's just a data. But through the process of analytics, through the process of collecting, defining, and cleaning and examining and observing and looking at patterns and groupings and trends and differences in similarities in our data, that's where we get to analytics.

Analytics is more than looking at a bar chart, although that gets you started. There's generally some higher order math in there, and some... I don't want to define a word with a word, right? Critical analysis is what gets you to analytics. It's not pretty charts and graphs, although pretty charts and graphs are often how we communicate the results of our analysis. So that's the learning and data and analytics part. The why instructional designers need to know about it is something I'm passionate about. Every single function in an organization has better data than we do in the instructional design space, everybody. And we sit here and say, "Well, why are we order takers, or why do people not value what we do? And why, why, why?" And well, often, we're not bringing the data that the other dimensions of an organization have to communicate their activity, their impact, their worth, and to measure their improvement against.

And so, I'm passionate about bringing to the table the data rather than our hunches around how people learn and what's going to work in the organization. And I think that we will have better, deeper conversations with the organization, the business, right, with our sponsors when we can bring data to the table.

Connie: Do you find that in many organizations, people are resistant or hesitant to give instructional designers or a training group meaningful data?

Megan: Yeah. It's funny, right? Because there's so much data that we have direct access to just in our own space, right? We have data that comes off of our tools, off of our learning management systems and learning experience platforms. We have all sorts of stuff. And I think we're not always doing a great job looking at that. And I have had situations in which I've heard of them from other people, I've had them in my own work, where we're teaching sales skills, and the sales organization is unwilling to give up

sales data in order to assess the impact. And that's astounding to me. Because I would think if they were going to buy a new sales tool, they would want data to measure whether or not that tool is working.

Now, what I'm loving is the rise of business intelligence within an organization. And business intelligence has been around for a long time, but really adding a hardcore data science look at things is, in my perspective, a welcome development. Why do we need to know about this? Because data is everywhere. And if we just kind of close our eyes and keep on making beautiful eLearning, we're going to be passed over, and our impact isn't going to be as great as it can be.

Connie: And I'm guessing that just by educating people and communicating with them and building relationships, you can often get over that resistance?

Megan: Totally. Totally. And I think there's two pockets of resistance. One is around knowledge is power, right? And so, if I give you my knowledge or my data, then maybe I'd be giving up some power. And so that has to do with some organizational dysfunctions that exist in the world. But the other is around data privacy and data protections, and it's really important also to pay attention to those things. And sometimes we get grumbly about it until we put ourselves. If it was my data, would I want that passed around? So, I get it. I get it.

Connie: A long time ago, Ellen Wagner came up with this approach or model or way to think about a career in eLearning. And Cammy Bean has talked about it and written about it, and she calls it the eLearning pie. And the pie consists of learning science or learning, creativity, which I think means the multimedia part, technology, and that's why it's an eLearning type schema, and business. They talk about, both of them, talk about how somebody needs to have competence in every single one of those. And it's nice and simple. That's what I like about it, whether it's the best or something else. I thought it was interesting when I thought of someone who is using learning data to design, to evaluate, to assess, it seemed to fit into a lot of those slices.

Megan: I'll just put this out there. I have a new shiny hammer called data and analytics, and so I'm going to see everything as a nail, right? So, at the risk of putting data in everything... Although I'm not going to put data in all the things. I haven't quite wrapped my head around the multimedia side of it or the creativity side, which we're measuring creativity. But anyways,

that's a whole other rabbit hole. I think learning and learning science, absolutely. It's the how do we design, and then measure the learning design and the impact of the learning. If that's something you're interested in, there's a lot of work going on there. The technology, it takes technology in order to gather the data, whether it's at scale. And I guess I'm particularly talking about quantitative data in that space. But at scale, even qualitative data needs to have some sort of technology space in order to analyze it efficiently.

And then the business. The business talks in terms of data. And as much as we like to say business talks in terms of money, money is... It's another measure, right? It's another piece of data, how much or how little, or how great or how long. So, I see data in all those spaces. I think this is a really interesting time for all of the closet geeks and math nerds who landed in instructional design to fully come into their own selves here.

Connie: It's a time for people to come out.

Megan: It is a time for people to come out.

Connie: So, what are some interesting ways that you've seen organizations use learning data and analytics to improve workplace performance? Because you have a lot of really fascinating examples in the book.

Megan: The book has so many examples, and that's really what I love because it brings it to life.

Connie: Right. Right.

Megan: Everything from the example at UC Davis with the nursing school students and just taking eLearning. And the average learner was doing okay. And then what they realized though, that there wasn't an average. It was actually two groups. There's one group who was just aching through everything, and one group that was struggling. And if you could identify the struggling group, you could help them. And if you could identify the group who was just kind of cruising through everything, doing just fine, you could push them or challenge them to the work around learning adoption that was being done at Edward Jones with Tiffany Jarvis, and really looking at what is the likelihood that somebody is to apply what they're learning and being able to measure that as a key metric for not only the how do we look at the learning program success, but how do we look at

that individual's trajectory and the people there. The navy looking at really, really detailed data around their pre-recruits, right?

You'd be recruited. But before you'd get picked up and assigned somewhere and sent to bootcamp, how do we keep you active and engaged all the way to being able to map skills using data? And what skills overlap with what other skills? And then how do you map people to skills in new roles that are going to be really, really logical for them based on the skills they already have? There are so many different things you can do with data. Here's the thing, all of these are things that the same learning models we've been talking about for decades now have said, well, you measure these things. We just haven't measured them in many cases. I'm not saying exclusively. But many cases, in practical cases, we haven't been measuring them with the rigor and depth that we now have the capabilities and the tools to do. And so, it's super exciting.

Connie: Rather than get into a lot of technical, super detailed aspects of data and analytics, what I was hoping we could do is I would give you a scenario and you can tell the listeners how you would think about it, the questions you would ask, how you would frame it, what you would do to solve the problem. Are you ready, Megan?

Megan: I'm ready. Let's do it.

Connie: All right. So, your client runs the L&D group for a large urban health center. She's responsible for improving performance of all the departments associated with inpatient care. The latest initiative she's been tasked with is finding a way to reduce hospital acquired infections through increased use of hand sanitizers by all employees before and after entering a patient room. So, they found that the hospital acquired infections are increasing, and they just need people to start using that hand sanitizer with every single patient. She wants to develop a really cool training module, something good, something fast, something simple, and implement a promotional campaign around the hospital, some kind of marketing advertising campaign. How would you be able to tell whether this is working?

Megan: Love it. Okay, so we're setting aside the design of the program itself.

Connie: Yes.

Megan: Okay. Because you and I could both agree that maybe a snappy training module is not what's needed here.

Connie: Maybe not.

Megan: Maybe not. But I love the scenario for so many reasons because we're starting before we built anything.

Connie: Right.

Megan: We're starting at the problem definition. And so, the question isn't our target completion rate for the snappy training video. Instead, we're talking about how do we measure whether or not our programs had any success at all? I'm a firm believer that the quality of your analysis depends on the quality of your data, and the quality of your data depends on the quality of your questions. And so, we start with questions. And some of them are obvious, right? So why would we want to include or why would we want to reduce infections, right? Well, it's better for patients, but I like asking the questions of the business sponsor in the first place, or the medical director or whoever's doing this, because there's often several whys around that, right? Because it reduces costs, or because it...

I'm making stuff up. If we use more hand sanitizer and we have a greater volume, we actually get a lower cost per tub of sanitizer because we're consuming more, or the insurance company is going to check on us. Because all of these then hint at other things I can measure as far as outcomes, right? So, I want to start with, why is it important? How do we measure success of that outcome? And is there data around that success, right? So, if the outcome measure is patient satisfaction, are we measuring patient satisfaction? If it's employee satisfaction, are we measuring employee satisfaction? And talking about those outcome measures early on and those outcome questions are really, really huge. So, I've got a bunch of things I could measure just based on that. And I start a very divergent thinking space where I'm just gathering all the things.

I'm not gathering any data yet. I'm gathering all the things I could possibly gather data on, right? So, this L&D leader is going to be doing a lot of, I'm assuming, performance consulting, figuring out why do or don't people use the hand sanitizer? What are the situations in which they do, all of which might yield other questions. Then we have the snappy e-learning module

and a campaign. Then there are metrics around that I can look at too. How many people engage with it, how many people complete it. If we make a quiz at the end, what is the score? How many times does it take to get it right? How many eyeballs do I get on a particular poster I might put on the wall? All of these things are big questions I could answer with data. And then I want to come up with a hypothesis.

And so, we talked about the learning sciences. I really feel like analytics is all around that scientific method. I have a hypothesis. The hypothesis is that people who engage with my snappy training module are going to be more compliant or better users of hand sanitizer. And then my... Now, that's hard to prove, that correlation is not causality thing. So, the inverse could be that the training program, the release of the program has no impact whatsoever on hand sanitizer use. That's actually easier to prove, see that value is those none, those null. And we either prove or disprove that null hypothesis. I'm getting into math. Anyways, then once I have my questions, I then say, what is the data I need to know the answers to the question? And that gets down to literally very granular name, date, location, activity, all this stuff. It starts to sound like XAPI statements.

You can do it in something other than XAPI, but XAPI just happens to be handy for this. And I then need to figure out how am I going to get this data. So, it's called instrumentation. It's my new favorite word. It's how do I get data hooks into the kinds of things I want to measure? So, I may only have... The LMS is great because if I put my snappy training module in the LMS, then I get some basic data out of it. Bingo. That's awesome. Most of the hand sanitizer stations I've used in the world are not internet of things devices. They do not tell anybody. If they were, then I could be instrumenting those. How do I collect that data? Do I have somebody check a box every time somebody uses the hand sanitizer, or I put two buttons on the hand sanitizer? One's for hand sanitizer, and one that's like a high five, you did it. And every time I bang the high five, I'm tracking it. But I have the ability to instrument for data.

Once I collect my data, I got to clean it, make sure there's no junk in there. And that's a big and important process, and I'm going to refine that. But then I get to look at my control groups, even if my control group is before versus after. I get to look at trends, I get to poke around and see if I can find patterns or groups or clumps or anything interesting. And then if I'm really, really on my game, I'll bring in somebody who really, really knows statistics to verify that the things that I'm thinking, I'm seeing are not there

by chance, or that are not there by some ridiculously tiny margin that seems interesting, but really, given my sample size, is not relevant. And then I have to figure out how to communicate my results.

And most of the time when we're communicating results, we're both... We have this dual purpose. We're both answering the questions that we got charged to answer, but we're also getting buy-in for the next time we do this process. And we're building credibility, and we are perhaps even building a case for getting better tools and more team and more skills around this.

Connie: I like it. What are some types of dirty data you would think, I'm not sure about this.

Megan: My dirty data's going to come from a few places. Dirty data can come from when I accidentally leave my testing data in my population when I'm doing the results. So, every time I run a report out of my LMS, I have to take out all the accounts that I know are test and admin user accounts. A test account is by definition going to be hitting everything, right? My LMS administrator hits everything. That's what they do. That's their job. So, I'm going to take those out. Other sources of dirty data or if I have, sometimes I've got people who are logged in as different sets of, I may have employees and contractors, they may all use the same system. But it may not have as much data on my contractors as I do my employees or vice versa.

And so, I might segment or toss aside that if I had a known bug. Sometimes we're using our data cleaning process to find bugs in our software or bugs in our system. So those might be things that I clean out. Huge source of dirty data in the learning space is dirty HR data, where we don't have good information on people's job roles or their functions or who their home manager is today, and all that stuff. That's all dirty data too. That affects my ability to make reliable conclusions from my data.

Connie: Interesting. Interesting. Another aspect of it that I think is interesting, you can measure, and hospitals do measure how many hospital-acquired infections happen. So that's great. That's perfect. You can tell if it's increasing or decreasing. But how do you know how long to wait? The timeline, is it three months, six months? Is it a year?

Megan: So, I don't know. There's no one answer, right? I think that's the kind of thing that you work with your business sponsor because they're much closer. And your subject matter experts and your actual learners, they have a better sense. But then I think also as you're looking at the data and you're looking at the trends. And when it ceases to become interesting anymore, that might be when you stop.

Connie: I like that.

Megan: That gets the difference between reporting and analytics, right? Reporting is something you do regularly all the time. Every month, people expect to see a completions report out of your LMS or a retention report, something, right? And those are the regular things you do. Sometimes analytics is, I'm answering a particular question. And once I'm done answering that question, I'm going to set it aside because it's no longer interesting. I've made my decisions based on that and I'm going to move on to the next thing.

Connie: Would you consider some kind of self-reporting as part of your data? What do you think about that?

Megan: I have a love-hate relationship with self-reporting. I love it because sometimes it's the best we get. And so maybe in the hand sanitizer situation, maybe the best we can do is to ask. People are using hand sanitizer more often, and yet people are for a variety of good and bad reasons. The worst at self-reporting. I think as long as we look at that with a critical eye, not a bad eye, but as long as we're aware of the self-reporting biases that come in, I'm okay with that. If I can get something that automatically happens that people don't have, if I could hook all those hand sanitizer stations to the internet, I might consider that a little bit more reliable, especially if I can hook the hand sanitizer with the door opening on the room, that would be golden. Right, right.

Connie: One interesting thing you mentioned was in a promotional campaign, you mentioned how many people are actually looking at the campaign posters, signs, banners. Would that have to be a survey also? Did you notice that poster on the wall?

Megan: That's how it's often done in marketing campaigns. So, did you notice its brand awareness? This is where I'd bring in my marketing friends, who by the way, have way better data than the learning folks tend to. I use

Facebook and every once in a while, I get a question on Facebook that says, "Are you aware of this brand?" Or in the last week, have you seen a post about this brand? That's exactly what they're doing. They're ping-ponging for brand awareness. And that's one way to do it. I dropped that in as specifically an example of something that's like there's no data hook to it.

Connie: One thing I'd like to point out to everyone, as you're answering these questions about the scenario, you're very collaborative. You're thinking, I'll bring in a statistician, I'll talk to marketing, I'll talk to HR. Whatever you need, it's a collaborative venture. You're not just working in a vacuum.

Megan: Vacuum, yes. Yes, especially if you're a department of one. But when we build learning programs, we work with subject matter experts because they bring the expertise about the content. We can work with our business intelligence teams, our IT teams, our marketing teams, our data scientists, colleagues. All these people are subject matter experts in things we're not and bringing them all to the table does a couple of things. One, it gets me the information and knowledge I need now. It also builds relationships in the organization that will help all of us get tomorrow's jobs, whatever they might happen to be, done. And so, I'm a huge fan of building those relationships and building that operational network that you need to get your job done.

Connie: Yeah, great point. Thanks for that. So, one of the reasons, of course, as you know, organizations love eLearning because then they can track whether someone has completed. And then if they get sued, they're no longer liable. You got training on it. But the requirement of having to take the same training year after year after year drives people crazy and the training doesn't get changed because nobody has time or money for that. You're onto the next project. So, what if people started complaining so loudly that they said, "We want a personalized approach to these 15 courses that we have to take every year." How can data help you do that?

Megan: So, I love this so much and having written a book about data and analytics, focusing on the analytics, analytics is not the only game in town when it comes to data. I can use data as triggers or catalysts to fire off, other things to happen or to not happen. So, one of the nice things about using XAPI is its interoperability and the fact that all of your learning experiences can drop data to a single source, but then that single source can be a repository of data that can inform personalization and recommendation in the future for other learning experiences. So, say in

2023, I take the 16 courses required courses, I need to... After I finish pulling my hair out for taking all these courses, I want some credit for that in 2024. And so, the 2024 version of the course could reach into the learning record store and say, "Oh, Megan took this exact same course or same content last year. How about we skip Megan ahead to the quiz at the end and if she can pass the quiz, she's good to go."

Now, I can't do this on every compliance course, but every compliance course that I can do this in helps reduce the overall burden. So, I don't mind that I can't do it for every course, because legally sometimes you have to sit there through the whole thing, right? So, I can be using data to hook in this way. I just last week saw a fantastic case study in Intermountain Health System, by the way, the healthcare context where if learners participated in a group live session with a trainer, a leader, their manager, something about a particular topic, they were given access to scan a QR code that would drop a XAPI I statement into the learning record store, that later on when they launched the course they had to take, it would say, "Oh, you've already gotten this content. We're going to skip you, head to the quiz and you'll be out of here."

People loved that, right? Of course, they loved that. And so that was a really creative way to do that. Now, here's the analytics side. The analytics side of that can then be to say, do the people who skip ahead, because they took the course in the prior year, continue to perform as well as people who took the whole course? And then I have the ability to be testing skills decay. I can be looking at and experimenting with the best way to route people through. How hard does the test have to be in year two? There are so many really cool things you could do with this. And people and their managers, everybody appreciates be able to take less training.

Connie: Right.

Megan: And as even trainers, even eLearning professional, we want to be able to walk down the hallway and hold our head high and be the person who makes the great stuff you really need and respects everybody's time in the process as opposed to, "Oh, that person makes the compliance training. I have to take every year."

Connie: I almost got kicked out of a car recently. The person was a position. When I told him I make e-learning, he said, "Get out."

Megan: So, several points about that. One, great use for QR codes. I wasn't sure that there was a use so that...

Connie: Oh, yeah. Really a good one. Also, I do want to differentiate between compliancy learning and the type of e-learning where you're really, and you may be doing this also in compliancy learning, but there's something about having to repeat it year after year. I want to differentiate that from the training programs where people are really building their skills in a way that they want to. They're learning things, and they're on a path to learning something and they're building skills. I'm not saying that all eLearning is bad. For some of the eLearning codes, I would not say that. Thank you so much for answering those questions and walking us through. I think it makes it clearer. So, let's just say someone is just loving this stuff, and they're saying, "I love data analyzing things". How can I begin to put that into my instructional design career? Or how can I specifically go out and find a job just in that field? I'm just the person who collects, gathers data, figures it all out, asks those cool interesting questions and answers them.

Megan: This is a really growing area in our field, and it's pretty exciting. In fact, I am working right now with Jason Hagg and Meg Fairchild on a learning guild research study on the state of data and analytics in organizations. And one of the things that we're finding is that, and this is not a surprising finding, but the organizations that are using data and analytics have people with the title data scientist or data analyst on the learning and development team, or adjacent or borrowed. The organizations that are not, they don't. So that is an emerging role. I have seen it from an organizational perspective. I've seen organizations bring in and connect learning design with analytics on the same team, which I think is really cool and interesting, instead of parking it over the LMS folks, they're bringing it down to the design side. I've seen organizations let the L&D team borrow business intelligence team members and data science folks that are core to the business.

So, it goes both ways, right? Learning people adopting the data skills, data people adopting the learning skills. I know one woman. She was a learning team leader. She was frustrated with the crummy quality of the data around learning that her organization had, as well as frustrated with the inability of the leader, the business leaders that she worked with to see and use good running data when they got it. And so, what she did, she's taking an internal rotation on the data science team in that organization. Pull me away. So, she gets to bring into them all that she knows from

learning. She's going to learn a ton from them, and then she'll come back to the learning team or not. I love it.

So, there's tons out there. There are lots and lots of courses. Actually, my team runs an XAPI focused intact program around XAPI and learning analytics that is super fun. I'm loving teaching that course. But there's tons of business analytics courses out there to which can... Most of the cases that they're going to present are going to be marketing and sales and production related cases. I took one from eCornell a number of years ago. But for your homework, you could do any data you had, so I brought learning data. So, it was great. There's lots out there.

Connie: Yeah, that sounds wonderful. And they've got your book, and you have recommended one or two others. I'll put all links in the show notes. So, I think we're good. Megan. Thank you so much.

Megan: This has been fantastic. Thanks, Connie.

Connie: I hope you now have a better understanding of the many ways to think about measuring the impact of training. If you want to dive into this topic, I recommend getting Megan's book. It's called Data and Analytics for Instructional Designers. Again, you can find a transcript and the show notes at thelearningcoach.com/podcasts/80. That's all for now. Take care, and I'll talk to you next time.