

**Episode 40, Data Literacy - Harnessing the Power of Data with the Must-Have Cross-Disciplinary Skills**

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**Jordan:** In some cases—for, I would say, for a lot of people—data visualization is the answer. It's not. It is a piece of the puzzle. Data and analytics is a process. It is a puzzle. You need different pieces. Yes, data visualization simplifies the data. It brings it to life. But if you can't get a diagnostic analytic out of it, I don't care how pretty that visualization is, it's junk.

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**Mike:** From the Center for Occupational Research and Development, welcome to Preparing Technicians for the Future of Work. I'm your host Mike Lesiecki. In each podcast we'll reach out to people who are actually on the front line of the future of work and hear what they have to say. That means interviews with industry, interviews with working technicians, forward thinkers in the field. We'll do some background research, and we'll curate that research to make sure you have the most up to date and relevant information. And in every episode, we'll suggest action that you can take. We want to inspire you to take that action. This podcast is brought to you by the Center for Occupational Research and Development, known as CORD, with financial support by a grant from the National Science Foundation's Advanced Technological Education program. Opinions expressed in the podcast do not necessarily represent those of the National Science Foundation. You can find out more about our project and our approach at "PreparingTechnicians.org."

Our guest today is Jordan Morrow. He's the VP and Head of Data Analytics at BrainStorm, Inc. Now, Jordan, I was reading the cover of your book, and it also says that you're known as the "Godfather of Data Literacy," and a global trailblazer. There's no pressure there, Jordan! But why don't you tell us a little bit about your background, and let our audience know what you're doing now, and a little bit about yourself?

**Jordan:** Yeah, absolutely. So, it's taken me, I think, a little while to warm up to that nickname of the "Godfather of Data Literacy." There's another one out there that...I don't know who gave it to me. But it was "Chief Nerd Officer." And that one I've been more happy with, because I'm as big

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a nerd as you get! But let me share a little bit about where those nicknames came from, and my background, and hopefully kind of relate it to the audience, or help them relate to me a little more.

So, I'm a big math nerd. I love math and statistics. I started my career at American Express. And my last role there is I ran a data and analytics group that supported the US Consumer Card: a portfolio for American Express. And that's their largest portfolio of credit and charge cards. Think: The Green card, Platinum card, or Delta card. And I ran a business intelligence group there.

And while I was in that, in doing that role there... Now I worked at American Express for in between 8 1/2 and 9 years. So, it's really where I cemented and started my career. I was tasked and basically told that I was going to be training people how to use what we were building. And that was okay, I went to school for a little while. And Mike, we have that connection with the University of Utah and went to school for a little while to be a math teacher. And I flipped out of that. But I like to teach. And so, while I was doing this teaching at American Express, I had the idea (right?): the massive amount of users I was working with: they're not data and analytics professionals. They're not a data scientist or data analysts. These are product managers. Could be marketing, etc.

So, I started to think: Wouldn't it be cool if we teach them how to use basic statistics? Essentially, teaching them how to use data. Not how to use the Tool and Dashboard. But how to use data! And I built a plan and I presented it to my executive vice president. And (wouldn't you know?) she told me, "No." She actually said, "No. We're not going to do that. They're not ready for that. Maybe in the future." Well, lo and behold, I mean, that's years ago now, if I'm dating myself. That's all the way back—maybe seven or eight years ago, at this point. Little did I know that I was stumbling upon "data literacy."

And not long later, Qlik, the business intelligence company, actually basically hired me to be an entrepreneur and basically said, "Go build what would become 'data literacy.'" So, that's really where that nickname comes from—is I'm one of the pioneers and inventors of that entire field of data literacy. And I've traveled the world

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with it. I've spoken at different things: conferences, companies, even at the United Nations. And that continues to this day. I get invited. I have about 8 to 10 speaking engagements on the docket, that'll be coming up over the next three to six months. And doing all I can to kind of push out this data literacy world, which is for those that are not the data professionals. So, that's the background in the career.

Personally: happily married, five kids, two dogs, and a bunny. So, we have a really quiet house. I'm a big outdoors person. I love to trail run. Run ultra-marathons. And just have so much fun in the mountains.

**Mike:** That's very cool, Jordan. I really appreciate your giving us a sense of where you're coming from on this. I'm gonna put a link, by the way, to one of your videos: a TED talk. I think people will find it very interesting. I'll put that in the Show Notes.

I know you "live" this particular issue, but why is "data literacy" so important? If you had to give a snapshot or a capsule of that to our audience, why is data literacy so important?

**Jordan:** When we look at where the world was pre-COVID, and if we look at where post-pandemic-start where it is today, to a lot of people it's no secret that data and the digitalization of the world is here! And it's been happening. And so, giving people the right skills to be able to—let's look at it from a personal level—to be able to compete, to get the jobs, etc., we can't be doing things the old way. We're past that, at this point. Data is here to stay. That doesn't mean everyone needs to be a data scientist, right? That's just not how it is. But we need everyone to develop confidence in their data literacy. So, let me define that.

When I was working at Qlik, we used the definition (we modified it): It's the ability to read, work with, analyze, and communicate with data. Nowhere does it say you need to be a statistician, a data scientist, machine learning—any of that. It just means that you're comfortable and confident in using data. Now, why does this matter? I can turn directly to the COVID 19 pandemic, as one of the most illustrative things to come about—probably in the history of this planet—for the need of data literacy. And it's not

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like one side of the political aisle over another was doing it better than the other. I'm sorry, there was misuse of data all over the place. There was pushing of data that was doing this, that was doing that.

So, not only from a career perspective, being able to compete in the technologies and the advancements in what's happening, we also need to be able to use data properly in our lives to make decisions. Like for example, right now, we're seeing in the United States inflation at a massively high rate. We're seeing interest rates on mortgages go up, right? Being able to read into that and say, "How does this impact me?"

Same with COVID, right? We're sitting here, a couple of years into this thing. And COVID is here. The virus is here. Probably never going away now. How do we deal with all the information?

A funny (like anecdotal) story from COVID was: early, early in the pandemic, given my background in data literacy (pioneering it), I was asked to basically write or speak to the media about COVID. And I refused. I said, "No, because it's too politically driven." And that was early in the pandemic. And, I would argue, it probably only got worse. And so, I'd freely talk about it now.

Data literacy is a skill, being able to decipher data. And one thing I want to also make clear for our listeners is, when we speak data literacy, we don't want to get rid of your human experience or your gut feel. We just want to give another tool to people to make better decisions. That's what data should be doing. So, with data literacy: Can we empower you to make better decisions? Combining it with your personal experience. Your human experience. Your skills. Your background. Everyone has a place with data and analytics. Whether you're an English major. Or an art history major. Or a data science major. Everyone has a place. And data literacy (to me) is one of those unifying skill sets or abilities that helps drive more holistic change and strategy with data.

**Mike:** Jordan, that's a great comment. And you're talking about skills that people have. Our audience, our project (*Preparing Technicians for the Future of Work*) does focus at the technician level. So, if you think... These aren't data scientists, but rather people that have technician

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responsibilities. What have you seen are the skills that THEY need? And how do you know by the way? What sort of skills does a... Let's call it a data technician for lack of a better word. But what sort of skills do they need?

**Jordan:** For me, one of the biggest gaps that exist (I'm going to use kind of a story) is: I get asked to mentor people in the data at the university and college level. And a lot of the ones that I'm asked to mentor, are those majoring or studying a data and analytics professional field—essentially like data science, something like that. And they'll say, "Jordan, what classes should I take?" And, I think, they're sitting there, wanting me to say, "Well, this is the data course, the analytics course, all that..." And it's like, "No, no, no, no. Your degree is going to teach you how to process and use data. I want you to take management classes. Leadership classes. Communication classes. So, like (with a data technician, a data professional, all of that) the reality is: When you're empowering yourself with data and analytic skills (with data literacy), we can't lose sight of the ability to lead, to communicate, to project manage, to product manage...while using data.

And that's the key to me is: There are massive skills gaps, right? On the business side of things, those people are not necessarily going to school for data. So, there's a skills gap in the data side. And then maybe on the data technician side, where they ARE using data more, do they have the business skills? And the strategy skills? Those are the gaps to close. I can teach you a formula of "one plus one equals two." You can learn coding languages: SQL this. You just have to learn how to do it: the syntax, etc. Where the gaps really exist are these interpersonal skills (sometimes called soft skills).

So, on the business side, we need you to improve your data skills. And on the data side, we need you to improve your interpersonal business skills. Those are the things that, if I'm hiring (which I am doing right now), if I am hiring, I can look at your resume. I can talk to you. And probably hopefully learn pretty quickly your technical ability with data.

Now let me dig into this other side. Can you lead a project? How are you with accountability? How are you with

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change management? With decisions, etc.? And that's the thing we have to also think of. And this might be the most overarching skills gap among data professionals and the non-data professional: Can you make a decision with data? We can build cool visualizations, we can build some just freaking-amazing statistical analyses. But if people don't know how to: 1) communicate it and 2) make a decision with it, what are you going to do?

So, we need to start thinking about data in a holistic approach. Not that we can just store it, analyze it...but where does it tap into the business strategy? How do we make a decision with it? Those are the things that bridge the gap—that close the gap.

And, I would say, anyone who's a data professional listening to this, connect with me on LinkedIn, and we can look at the soft skills. If you're a business professional, trying to get into data, home in on your communication and leadership, while building your data literacy. Those are the gaps that need to be closed for businesses to truly succeed and get good ROI with your data.

**Mike:** Those are good comments, Jordan. In our project, we've looked at (what we're referring to as) cross-disciplinary skills. And certainly, in one column, there's things like "data literacy," and, in the next column, there's "knowledge of business processes," right? We're seeing that as something that really is important. And you just emphasized that in your remarks. So, I think that's a good take-home message for us.

Now, Jordan, let me turn to your book. I've got a copy of your book right here. I've been reading it. It's published in 2021. It's called "Be Data Literate." I'll put a link to that in the Show Notes.

What struck me, Jordan, what helped me frame this, in my own mind, is you lay out four levels of data literacy. Can you elaborate on that for our audience? I think it'll really help us understand that. And then I'm going to ask you, "Where does a technician's responsibility fall on those four levels?" So, double question: "What are those four levels?" Elaborate a bit. And then address, "Where you see a technician's role within those levels?" How's that sound?

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**Jordan:** That's great. So, there are four characteristics of data literacy. That's the Read, Work with, Analyze, and Communicate. And four levels of analytics: Descriptive, Diagnostic, Predictive, and Prescriptive, I'm going to share an analogy (or a story) around the four levels there. And then I'll talk about what makes those levels up. And because you asked me in the email, "Is the technician on the descriptive and diagnostic?" I am gonna actually probably say, "Yeah, the majority." And you'll see why.

So, the story that I use (and it's pretty funny)... I was using this story all the time pre-pandemic. Then I stopped. And you'll see why. And then I brought it back—maybe a year ago. But I want all of us to imagine that we're sick, okay? (That's why I got rid of it during COVID, right?) And you go to the doctor. And the doctor (he or she) walks in. Sees you. And you tell them what's happening. They look at you and say, "You're sick." They leave the room and never return. Now how many people are ever going to go back to that doctor, right? All that doctor did was describe what was occurring, i.e., a "descriptive analytic." Now don't get me wrong, descriptive analytics are powerful. We need them! We need to describe what happened last quarter, last month, last year, what happened in the marketing campaign, what happened in this, what happened in that—we need a descriptive analytic. But we need to take it further, right?

So, the second one, imagine that doctor, (he or she) says "You're sick. And here is why." That's your "diagnostic level." Or your "diagnostic analytic." Level two, right? You're now saying because of this, this, and this, this is what is happening to you. In the business world, those are the first two levels. The vast majority of organizations really only succeed at level one, if they are succeeding there.

There are four levels. But one of the major reasons they don't progress past that, is they don't know how! The vast majority of the users of data... (And this can be technicians. It can be data analysts. It could be a marketing manager.) They don't know how to get past the descriptive analytics and do a diagnostic, right? We look at a line chart. We can see the line is going up. Maybe we're not very good at getting to WHY that is happening.

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So, back to our story. The third level of analytics is "predictive analytics." So here, your doctor describes that "You're sick." Level one. Tells you "WHY you were sick." Level two. And, in level three, builds a predictive analytic that says, "If you do A-B-and-C, X-Y-and-Z can occur. This is how you will overcome this. Or this is what you can do to get better." Same thing in the business world. You describe WHAT happens. Level one. You know WHY it happens. Level two. Now let's build a prediction for level three.

And level four is the "prescriptive analytic." The prescriptive analytic is almost like a doctor giving a prescription. Something is going to tell you what to DO in analytic space. In the sense of being sick, an external thing (the medication or whatever it is), comes in and fixes you (or hopefully does), and the analytics in data space (It could be machine learning. It could be software.) tells you what you should be doing in your business. So, those are the four levels.

Now, the one thing we need to make sure, just like with doctors, they don't always get it right. In the data and analytics space, we do not always get it right. It is an iterative process. So, we learn. And we grow. And we build.

So now let's divide those four levels up among skill sets. The vast majority (We are talking 90 to 99% of employees in an organization.) will be in levels one and two: descriptive and diagnostic. That 1 to 10% will be in predictive and prescriptive. Those are your advanced practitioners of data. Data scientists. Machine learning ops. Artificial intelligence. Boom. The first two levels are descriptive and diagnostic. This is your data literacy skill.

Now, one of the characteristics, remember, of data literacy (of the definition) is to communicate with data. So, you might not be a practitioner of all four levels. You might be in just levels one and two. But you should be able to converse across all four levels.

So, when we think about a technician, if we're looking at those who aren't going to be the advanced practitioners, "Yes, the majority of your time is probably going to be spent in levels one and two."



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But the other thing that I would elaborate on within the four levels of analytics... You might not be a PRACTITIONER of the advanced levels. But getting really good at ASKING QUESTIONS of the data that can be ANSWERED by advanced levels is a wonderful data literacy skill to have. Can you ask a truly data-driven question, that then you go to your buddy, who is a data scientist, and say, "This is my question. Let's test it."

So, it all works together in a holistic manner. But the vast majority of people, especially from the data literacy side, will be at levels one and two.

**Mike:** Jordan, as I look at programs that I'm aware of around the country, a lot of them, as you say, will talk about data visualization, right? So, we're getting better at that, I suppose, except sometimes we get enamored by pie charts. But that's another story. I don't think many of us have really stressed necessarily that push towards diagnostic. I think our education program should make sure they're encompassing that. [Jordan: Absolutely.] And make sure that they're bringing in diagnostic.

**Jordan:** I'd love to say one thing on that. Unfortunately, over the last decade, the prevalence of data visualization tools has (in some cases, I would say)... "For a lot of people, data visualization is the answer." It's not. It is a piece of the puzzle. Data and analytics is a process. It is a puzzle. You need different pieces. Yes, data visualization simplifies the data. It brings it to life. But, if you can't get a diagnostic analytic out of it, I don't care how pretty that visualization is—it's junk! Maybe the design is a descriptive analytic dashboard. That's great. But can you drill down in it? Can you filter it? Can you get past just a description? I think that's one reason companies are stuck at level one, is they're enamored with the tools and technology. Versus "what you should be enamored with" is the ability to use data to make decisions.

Data visualization is wonderful. It's needed. But it's only a piece of the puzzle. Unfortunately, you're exactly right. We teach "data vis." Are we teaching people how to do diagnostic analytics? And get better there? I would argue (the same as you do) that we do NOT do that very well.

**Mike:** Good point there. Jordan, think about education programs a little bit. Can one get a degree or a certificate in data

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literacy? (It might not be called that. It might be called data analytics or something else.) Can you get a degree? (I'm talking about a two-year degree or a one-year certificate.) Or is that bundled into a program? What have you seen around the country?

**Jordan:** I don't know of any degrees (two or four year) that exist within data literacy, unfortunately. I did help pioneer and build the world's first data literacy certification. And yes, there ARE certifications out there in different spaces. For example, there is the Certified Analytics Professional. That is done by INFORMS. It's product agnostic. It's about analytics. I believe they have an Associate Certified Analytics Professional.

And I think we're going to see more and more. Right? There are tool-specific certifications. That might be more data-tool centric. But what you may find is there are going to be data-literacy minors in school. I do think you are going to see a data-literacy major in universities, etc., or in degrees. And so, you're starting to see it. Yes. You are starting to see it grow.

But one of the great things about data literacy (and this is one thing I would say, especially when you study how the younger generations are learning), is they go to YouTube, right? They go to these different channels. You can get really, really, really good. And empowering students and younger generations (even the workforce) to get good at data RIGHT NOW without that official degree because there's so much content out there.

What I do see happening is, "Yes." Whether it's bundling those things together. And we are seeing, I think (I'm trying to think of what school it is. I can't think of it off the top of my mind.), where you might see a data-literacy degree come about.

There are certifications. And you are starting to see it—to your point—of being bundled in somewhere. In reality... For example, Columbia University is bringing me out. They had me speak in the Fall. And in June, I'm going to go on-site, on-campus, and teach students. (I believe they're in their undergrad in Statistics, or the master's in Statistics) I'm being brought in to teach them the non-technical skills, which would be that Communication (those softer skills). So, you are seeing it start to bundle in there, too, into

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the normal degrees. That would be your traditional data science, statistics, machine learning, etc.

**Mike:** Okay. Good. Good perspective on that. Now, Jordan, for our final question (It's sort of the wrap up question, right?)... I was looking at the last chapter in your book, and it says, "Begin Your Data Analytics Journey." That's a cool title for a last chapter. But think about it in our context now. What advice do you have, let's say, for a faculty member or an educator who wants to thoughtfully bring in data analytics? I mean, they could be teaching manufacturing technology. Or biotechnology. Or one of those technologies. How do they start bringing in data analytics? What would you advise?

**Jordan:** Yes, and I don't mean this to come off self-serving in any way. But one of the first things I would do is make my book a required reading for a class. Okay, one of the textbooks. And the reason I say that is, I think a lot of times, for people who are going to school, who maybe are not going to school for a data-professional type degree (or for a career in that), data literacy is the key to that subset of people.

And I remember one time I was running the trails here in Utah where I live. And I had someone that I knew was running up the trail that I was running down, and she congratulated me on my book. And she said, "I'm probably too stupid (or something to that effect) to understand it." That is the complete opposite of the intention of the book, as you're studying it, right? The intention of the book is to empower everybody to think about data differently. To use data differently.

So, for a faculty member or educator who wants to bring it in, you make the book required reading and then intersperse it into your curriculum. Intersperse ideas and thoughts. The ability to critically think on data and information, I would argue, is universal across any degree that is being offered at a school or university. This ability to critically think on information and then make a decision with it.

The understanding of descriptive analytics is not just a data thing. We see it all the time. And maybe we could call everything that we're using as a descriptive analytic is data. Are people in your program (or in your classes) good

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at the diagnostic side? Hopefully—and I'm going to "let a little cat out of the bag"—Book Two comes out this summer about being data driven, and I'm writing book three (or about to start book three). And it is all about those four levels of analytics and getting deeper into those: how do you do them, both from the non-technical and (I will bring some) technical names.

So, that's how it gets started. Is to bring in elements of data and analytical learning, not from a technical, not from a professional standpoint, but use my book, Study it. And it might not be that you have to make it required reading for the students. Buy a copy and just dig the points out of it. Because then, what you want to do is, you're bringing in an ability to use data and analytics (hopefully, effectively), without having to be one of those advanced degrees in data and analytics.

**Mike:** Great advice! Jordan, I have to admit, as I was reading your book, I'm thinking, "Boy, I really need to move from my programs..." More from this "just descriptive focus" and start including the diagnostic.

And then thinking about being able to discuss and use the language (like you suggested) with your colleagues. Talking about the predictive and prescriptive aspects. I think that's good advice.

Jordan, just a pleasure talking to you today, shining a light on this data literacy aspect of our programs. It's happening. It's happening fast. And it's really a strong growing thing. I want our students to come out, and go into an interview, and say, "Yes, I've got some experience not only in looking at data from a descriptive standpoint, but actually using it to make decisions based on data." I think that would be a great aspect. If I had an interviewee sitting across the table from me wanting to come into my company, I think I would appreciate that.

**Jordan:** Absolutely. What I would say—and this is how it happened with Columbia University—she heard me speak. And she heard me speak on a panel or something. And now she's brought me in multiple times to teach these things.

Anyone who's listening to this, who's an educator in any way: connect with me on LinkedIn and I'm happy... I love teaching this. You could probably hear a little bit of

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passion in my voice! But I love doing it! I think that these are skills that are necessary. These are skills that everyone needs, especially... Let's face it, the digital world is just going to become more digital. Our world is getting bigger and bigger in this space. Having skills with it is a very valuable thing.

**Mike:** That's a great wrap up comment. Jordan, thank you again. A pleasure talking to you today.

**Jordan:** Awesome. Thank you so much.

**Mike:** Listeners, today you heard Jordan talk about the need for data literacy. He explained the four levels of data literacy that start with descriptive and diagnostic uses of data. And then talked about the more advanced levels that include predictive and prescriptive uses of data.

But I think there's a question for all of us today. And here it is: "Can you—and can your students—make a decision using data?" I think that's an important question. I'd like to point you to resources in the Show Notes to help you answer that question, and develop those skills within yourself and within your students.

Our podcast is produced by John Chamberlain at CORD. Thank you, John, for all of your excellent work. And our project is led by Principal Investigator Ann Claire Anderson. Thank you, Ann Claire. And thank you, our listeners, for ***Preparing Technicians for the Future of Work.***

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Lesiecki, Michael (Host). Preparing Technicians for the Future of Work Podcast: Episode nn, *PodcastTitle* (audio podcast, transcript). Center for Occupational Research and Development, Waco, TX. 2022. Retrieved from <http://www.preparingtechnicians.org/>