Episode 1,217: How the State Sucks the Life Out of Education, and How the Private Sector Just Made a Great Leap Forward in Math

Guest: J.W. Weatherman

WOODS: All right, I do want to talk about your Mathbot, but I guess we want to set the stage for why it's necessary for the private sector to do these sorts of things. I think the natural order of things is that the private sector should do them, but we're of course assured all the time that, don't worry, the government's got this all well in hand. Just send us your kids, and we'll make sure the information is deposited in their brains. Somehow, that doesn't seem to be working out, and so the real innovations, what's really exciting in education is all happening in the private sector.

So let's start with the so-called public sector and the way science and math is being taught there. A lot of people will complain about Common Core, but I bet even before Common Core, I mean, I think it just goes well beyond that. So what are your thoughts on this, and how did you get interested in this area?

WEATHERMAN: Yeah, well, I've been a software security expert for about 20 years and for the last decade or so doing startups out of Silicon Valley. But I was also a professor at a university earlier in my career, and I've been an executive, so the need to get hold of good talent has always been forefront in my mind and education is the way to do that, especially — there's a constant need for new software developers. We're going through a technology revolution like the Industrial Revolution, and there's just not enough mechanics. So if you're at all related to software, you're constantly trying to figure out ways to solve this problem.

And the way that it really hit me was that I had sold the company and went out to dinner with my wife. It was actually our anniversary dinner. And it was good timing, because as an entrepreneur, you have downtime between sort of starting a new venture and building it up. The normal life cycle for a startup is you sell it to a larger company and then you have a couple years of downtime. So this was about two years ago, and I was having dinner with my wife, who also — you know, she doesn't go through as big of the swings as I do, but after I've sold a company, she has more downtime in the sense that I'm less stressed out and things are in a little bit of a lull.

So she was tutoring some kids in the neighborhood, and one of the kids, their parents, they were basically on the verge of doing medication. They couldn't figure out how to help this kid do better in math. So we're at our anniversary dinner, and she starts explaining to me this new math, this Common Core stuff that has been pushed out nationwide with no pilot, no testing, nothing, and our whole anniversary dinner was just me on the edge of throwing up with rage.

Because what they've done, I guess to put it in context, for about 2,000 years from Alexander the Great all the way through Einstein, everybody learned math using a standard textbook called Euclid's *Elements*. And it probably evolved over the centuries and millennia, but it's really a lovely way to learn math, and if you look at it, it will help you understand why Einstein was able to do thought experiments and explore the nature of the universe just by sitting back in the patent office, because math is all about problem solving and exploring the relationship of logical concepts with each other. But you and I, as older guys but not as old as Einstein, we went through a version of math that was really a statist version of math that was all about following a procedure. So you accidentally solve a problem; you don't actually get to do any real problem solving in the sense that everybody before us got.

Common Core has taken that to a whole new level, where not only is it strictly about following the procedure, but you might have to follow three or four different procedures to get the answer. And it's completely incidental whether you get the correct answer or not. The absolute focus is on the process and basically the paperwork. So what the public schools have done — and I don't know if this is just the invisible hand of corruption. That's what I tend to think it is, just over the decades people trying to maximize their own benefits in a monopoly system. But honestly, if you were to try to design something to just crush the love of learning and make math as odious an experience as possible — I actually have a list of bullet points that I put together of the ways that I would go about making the most evil system of teaching math possible, and I am not exaggerating when I say Common Core checks every single box. It is brilliant in its evil.

WOODS: Wow. Wow, I'd actually like to see that checklist. I'm curious, because it sounds diabolical.

WEATHERMAN: Diabolical is exactly the word. So let me just give you a couple, because it's always top of my — So one of the things that you would do — so the human mind is set up to enjoy problem solving. Math is logical exploration and problem solving. So if you wanted to do it in a really evil way, you'd have to find a way around the chemical reward that kids get and adults for solving a problem, because we kind of get addicted to doing good in that sense. You make the world slightly better, your brain rewards you with dopamine, and you want to do it again. So if you sit back and think how would you do that, it's actually a really hard problem. How do you teach kids how to problem solve without letting them be rewarded for that? And the answer is you just don't let them problem solve. What you do instead is you overload the word math.

So when I say math and when Einstein would have said math, he thinks of problem solving, and using tricks like "carry the one" is sort of a side effect to problem solving. These are handy shortcuts to being able to add a number multiple times over again, but what they've done is they've used the word math to literally mean just following a process and a procedure. And you know that they've done that, because kids don't ever, when they get to the right answer after following this procedure have that moment of, "Ah, that's it!" If you never that ah-ha moment, then you're not problem solving, then you're not actually doing math. So if that's not diabolical, I don't know what would be worse [laughing].

One more quick example is, if you were introducing kids to numbers and counting, it would be really important to focus on a single number system. So we use a 10-based number system, we go up to 9, and then we move to two digits. Software computers use a 2-based number system, so you just go up to 1and then you have to use another digit. One way to really make

it difficult to start thinking in numbers would be to introduce as many different number systems as early on as possible, and the more illogical, the better. And illogical might not be the best word, but the more confusing, the better.

So what we do to kids now is we introduce them to and we actually have them focus a surprising number of hours on the two worst areas that we have in human life at this point for a real logical number system, and that is clocks and the imperial system. So with normal numbers, it's always 10-based, and you have decimals and those are parts of 10, you have a comma that represents now you've moved over to another chunk of 10 to 1,000. It's very logical in its structure. But if you look at something like a clock, it goes up to 12. Well, that's weird. And then it starts over and it goes to 12 again. And then there's this other level where it's a.m. and p.m. Now, we're all comfortable with that because we've dealt with it, but imagine learning to go up to 9 and then stop, and then you're also learning to go up to 12 and then restart, and you're learning a.m. and p.m.

And the imperial system is like that on steroids, where you go from inches, which you just work in fractions exclusively sub-inch, and then above that, you have a 12-based system. Above that you're looking at how many feet are in a mile, that's a 5,000-and-some-based system. And then you can also go to yards. It's just not a good way to start thinking about numbers when you're having to learn multiple number systems at the same time.

So they do that to a really surprising degree, and those are just a couple of the things that I would avoid if I was trying to teach math well, and I would definitely want to emphasize as much as possible if I was trying to make it just a miserable process.

WOODS: Right. Right, right. Yeah, once you get to a point — I mean, let me say this. Some people, no matter how you teach math to them, are just not going to like it, and they're not going to take to it and it's just not their thing. And that's fine, in the same way that there are a lot of topics that you might teach me that I'm not going to care for. I happen to love math. I think math is elegant and beautiful and wonderful. But I got to a point where I was the captain of the math team and I was doing really interesting math, where it was like puzzle solve. The problems that I had to solve were not the kind of problems I could flip a book open to, find an example that's identical, and just by rote repeat the steps. I had to think about it the way you would think about a brain teaser, and that's why I enjoyed it, because it was fun and it was challenging.

In fact, I remember one of my classmates saying to me, as nicely as he could, "Do you actually enjoy being on the math team?" Like he couldn't quite get where I was getting satisfaction from. And I said, "Well, I think that maybe it's that you enjoy things that you feel like you're good at, and I do think it was partly that, but I just took a real pleasure in solving puzzles. I like to solve puzzles. And in a way, it's kind of like one of the things I enjoy about libertarianism, that a lot of times, you are involved in solving puzzles. *How would society solve X problem without coercion? Go.* Well, that's a puzzle, in a way. How is that possible? How could we make that happen? And you use your knowledge of economics and other disciplines to try to hammer out an answer. So anyway, that's just my own observation, that the joy that I found in math was that I was doing a lot of math that wasn't just: here are some steps, here are 87 problems to apply those steps to, now go do them and then hang yourself. It wasn't that at all.

WEATHERMAN: Right, right. Actually, I would push back on that a little bit and say that everybody enjoys math. So I think what happened with you is you were probably good enough at the procedures to where it wasn't super painful for you to do it, so you just cranked out the stuff. Like when they gave you a worksheet that said multiple 2 times 10, multiply 5 times 10, multiply 4 times 10, you probably just said, "All right, I'll add a 0 on these," you cranked it out, and you moved on, and it didn't really affect you.

But there's other kids that — and a lot of times this is actually related to intelligence — that just cannot stand that, that would literally rather stab themselves with a pencil than actually do that. Once they see the pattern, it's very hard for them to continue to fill out that form. And I think those are the guys that, at least in my experience as I've been helping more and more kids with math over the years, those are the kids that get diagnosed with learning disabilities. Those are the kids that end up getting medicated, and it's not because they're dumb; it's actually because they're just sort of strong-willed and, in a way, they're too smart to put up with this nonsense. They won't put themselves through this mental anguish. And it varies how much mental anguish there is. So it's not strictly intelligence. Obviously you were a super smart kid. But that tends to be the thing that I see more than they're just dumb.

And it makes sense, if you think about it. If you look at something like Euclid's *Elements*, the very first problem is he gives you a line, and he says you can draw two circles and you can draw a straight line, and you can't do anything else. And you need to think about how you can take this line and you can cut it in half. You can bisect it. Well, that's kind of an interesting puzzle. And if you have a teacher there that gives you hints along the way, there's nobody that would hate that. I'm sure there are exceptions, but in general, if you have a normally functioning human mind, you're going to enjoy something like that, because we're basically hardwired to do that. So I think we have a tendency to think that people don't enjoy math, but really what they don't enjoy is the process and the procedure and the chaos, frankly, that's introduced into their mind as they're trying to explore logic and reason.

So that was really the inspiration to start Mathbot, is I believe that everybody enjoys math. I believe if it's taught well, everybody will enjoy math and programming, which are really synonymous, incidentally. It's programming if you were to use a word, like "add," and it's math if you use a symbol like the + symbol. But other than that, it's an identical activity. So I believe that everybody enjoys programming. I have yet to meet anybody that doesn't enjoy programming and doesn't enjoy math.

So the question then is: how do we go about destroying this evil system? How do we go about, as ancaps and for myself as a technology person, how do you address the problem? And for me, it was obvious. I didn't want to try to do politics. I didn't want to start spending my money on lobbying or anything like that. I really want to build an application, make it free, and if everything goes well, maybe we've got a 1 or 3% chance of this all lining up, but those odds are okay because if it all works out, I will have the pleasure of putting thousands, maybe millions of public school teachers out of work, and I can't think of anything that would be more satisfying than that at this point.

WOODS: So talk to me about Mathbot.com and how that is — it's a great thing in and of itself, but also kind of a shot between the eyes to this traditional way of getting people into math and related fields.

WEATHERMAN: Yeah, yeah, it's very much a politically motivated project. If you go out to Mathbot.com, you're not going to see that. It's just, hey, learn math by programming a robot. Log in, you've basically got pictures that represent your functions, so it's very easy to get started. You don't even need to know how to read in order to play Mathbot and start programming. Within about 50 levels — so I would say if you're five years old, you're probably going to tap out maybe around level 20 or so, but that's fine; you just wait until you brain develops a little more, and then you can get to level 30. But I'd say if you're 8, 9 years old, you can get all the way through the first 50 levels. And at the end of those 50 levels, you haven't done anything that's hard, because again, math is very logical and systematic and incremental. It's really just layers of abstraction.

And each layer should be a very small step, so after those 50 very small steps, you're already programming recursive functions and you're programming with conditionals. So you're actually writing code within those first 50 levels, and I have seen more than a few — we've got a few thousand people playing the game at this point — more than a few kids around that age actually have no problem getting to programming recursive functions, and that's actually something professional programmers will have to pause and have to think through. So the potential that's there I think is really incredible inside every one of these little guys' heads. And again, it's not just for little kids. If you're thinking about a career change, I definitely would encourage you to think about software. This is a great place to do it, as well.

So you won't see that there's like a political motivation, let's call it, although I hate to use that word, just by playing the game, but it really is an attempt to just make it really obvious, frankly, that public schools never taught math. They always taught how to fill out paperwork. And when kids learn math for free online — Khan Academy at one point had the potential to do this, but they sort of got absorbed by Common Core. If kids are learning how to do this for free online, it's just going to make it really obvious that public schools are not needed for that crown jewel of math, and then I'm hoping that it starts a flood where other people go after things like language arts, and we can just completely make it obvious that public schools never taught this stuff well. In many cases, they tried to indoctrinate and inoculate people to these subjects, and I think math is a perfect example of that, and that they were really always just a low-quality daycare. So that's really the goal. Yeah, I think we're doing pretty well so far. It's pretty exciting.

WOODS: So where are you now? I know that Mathbot.com is up, because I just went there myself and started doing it, but is it a work in progress? Is it all done? Do you have further ambitions for it? What's it going to look like ultimately?

WEATHERMAN: Yeah, so we've got levels that are internally available to all the team. They go all the way through calculus. So we've got a really, really solid roadmap. Right now, we go all the way through programming, which is actually we start with programming, because what we wanted to do is we wanted to give the power to move the robot around and control the environment, move blocks, do addition problems right off the bat, because that allows us to completely eliminate all of the redundant, rote processes. If you can write a function that solves an exponents problem, you don't have to sit down and solve 400 exponents problems. Like, you've got it. You've actually taught somebody else, in a sense. You taught the robot how to solve the exponents problem.

So we start with programming and we go through calculus. Right now, we've got all of the programming levels released. So within I would say the next couple weeks, we'll have addition

and then subtraction, because again, we've got it all internally, but what we're trying to do is not push it out until it's super, super polished and a really clean experience. And yeah, I would say that any kids that jump on it right now, we'll probably be able to stay ahead of them at least through division. After that, we have some features that we need to add for. Really, it's kind of design problems, like how do we visualize putting an object in orbit around a planet? How do you calculate that? We've more or less got that, but we've got some work to do there.

So I would say, if a kid started now, we've got them covered up through exponents, which is through eighth grade. It's kind of incredible how little math gets accomplished from kindergarten through eighth grade, but it's basically counting, addition, subtraction, multiplication, division, exponents. Those six topics are the core of what's accomplished in more than that number of years. It's really insane. So yeah, if you sign up now as a kid, I think we've got you covered, and probably by the time you've gotten done with exponents, we'll have calculus up as well.

WOODS: You are more associated with Bitcoin in the public eye than anything else. Is there any connection between cryptocurrency and this project?

WEATHERMAN: Yeah, actually, so I would say maybe six months ago, I decided — I'm kind of bad with timelines. I guess I started working on Mathbot about three years ago, and about a year ago, I decided that I was going to shelf it for a little bit, because I couldn't figure out how to get past this problem. We'd built the first version, which is the one that's only available internally, and we did a bunch of testing, and what we found out after putting 200 or 300 kids through it is that — and it should have been obvious in hindsight, like almost everything [laughing].

But what we found out is that kids that had parents that were providing external incentives — like if little Billy passes the first 50 levels, I'll buy him an ice cream — those kids just thrived and they just burned through it. And then the majority of kids that didn't have any parents' involvement, parents weren't around, where there wasn't any external incentives, they really kind of floundered. And some of them did it anyway, but they're the exception, so they're the kids that are going to thrive even in public schools. And since the goal was to do something really broad and fully replace the need for public schools to be involved or pretend to be involved in math education, I was a little bit stumped of how I could scale that and address those kids that don't have parents that are really involved at that level.

And then about a year ago, I got obsessed with Bitcoin. I'm a software security expert, but I really hadn't looked into Bitcoin. I was very skeptical that it had value. I knew that on an economic front that if it worked, it would be amazing, just from being obsessed with Mises and Rothbard and Austrian economics. But as a software security guy, you become very jaded fairly early in your career [laughing], so I thought it was garbage. But a year ago, I looked into it. I threat modeled it and concluded that I couldn't find a way to break it. And then a few months later, I realized, wait a minute, if I could actually have parents or grandparents maybe pay $50 for algebra and then give kids $2 or $3 worth of Bitcoin every time they passed an algebra level, that might be a way for me to scale up the incentives and really go much broader. So that kind of breathed new life into the project. And yeah, I would say right now I'm probably 80% obsessed with Mathbot and 20% obsessed with Bitcoin.

WOODS: All right, very good. Now, you said earlier something about you're continuing to work on it and so on and so forth, but people should just go and sign up immediately and just start using it, because as you say, there's plenty of stuff to keep them busy as you're putting the final touches.

WEATHERMAN: Yeah, yeah, absolutely. I mean, I'm not exaggerating when I say that if you want your kids to learn math and programming, there's no better place, there's no better resource that I know of. And obviously, I may be a little biased, but frankly I started working on this problem not because I wanted to be a founder of yet another startup, but because I really, really see a huge need. And so as of right now, I really couldn't in good conscience recommend anything else other than Mathbot.com for you to get started with math and programming. Sure, we're still in development, and so if you're using a browser that's not — if you're using Safari instead of Chrome, maybe you'll see bugs that we haven't seen yet. But if you do, that's great. You can hit me up on Twitter at @WeathermanIAm, actually, with any issues that you see, and we'll get them fixed. So you'll actually be contributing to the project in that sense, as well.

But really, if you fire up Mathbot.com right now on whatever device you're on and you start playing the game, you'll see that it's a really high-quality project that's not like a lot of the altruistic sort of efforts that are out there that are really low-grade. This has been really well funded with absolutely the top talent, and I think you'll feel that as soon as you get out to the website and start experiencing it. So that's absolutely where I would start, and yeah, if anybody does get excited about what we're doing and wants to contribute, there's a lot of opportunity there. But there's really no better place to go that I know of than Mathbot.com right now.

WOODS: Absolutely great. All right, well, I'm going to link at TomWoods.com/1217 to Mathbot.com, as well as your Twitter, so, as you say, people can reach out to you. And I would like people to check this out. I can say as a borderline guarantee that before today is out, my eight-year-old will be on this site doing stuff, so it's going to be — and I have kids of other ages who could also benefit from it, but she in particular will just go nuts for this.

So I'm really happy that I found out about this, and thank goodness somebody wrote to me and said, "Woods, you blockhead" — not quite that way — "there's a great project out there that you should know about." Because you know, there's so much doom and gloom in the world, and sometimes this show reflects that, and it's great to see there are people out there lighting that proverbial candle in the darkness, actually doing something instead of just griping all day. That's how we win, is by actually doing something. You don't like what's going on? Then create a replacement. And that's what you've done here, so congratulations. Mathbot.com is where people should go, and continued good luck with it.

WEATHERMAN: Thanks a lot, Tom. It was really amazing to be able to come on the show and talk to you today.