



## What is Your Child's Math Age?

Aditya Nagrath  
The Elephant Learning Academy

EPISODE 44

### [Quote]

“If we can connect written mathematics to what's actually happening in the real world, then that is understanding mathematics”

### [Description]

Did you know that Preschool math scores predict 5th grade performance, and 8th grade math scores predict high school drop-out rates? Most high paying jobs from engineering, software to architecture – all need math, yet only 25% of high school students meet standards.



In this episode, Aditya, CEO of The Elephant Academy, explains why students fall behind in Math, how e-learning helps and how his approach gives parents and children tools necessary for success.

### [Intro]

**Jaison Dolvane:** Did you know that Preschool math scores predict 5th grade performance, and 8th grade math scores predict high school drop-out rates? Most high paying jobs, from software development to engineering, from data analysis to architecture – all need math, yet only 25% of high school students are meeting the math standards.

Aditya Nagrath is the CEO and Co-Founder at Elephant Learning Math Academy, an automated math academy that guarantees your child will learn one year of math in three months with only 30 minutes a day.

Elephant Learning was founded by two university mathematicians who based their methods on hundreds of years of research, and have now taught over a million months of math to students. In this episode, Aditya talks about why students fall behind in Math, how e-learning help and how his approach equips parents and children with the tools necessary for math success.

[Episode]

**JAISON DOLVANE:** Okay, welcome Aditya.

**ADITYA NAGRATH:** Hi, thank you for having me.

**JAISON DOLVANE:** Our Pleasure. So Aditya tell me a little bit about your background and how you got started.

**ADITYA NAGRATH:** Yeah, sure. Got started with elephant learning math academy?

**JAISON DOLVANE:** Yeah.

**ADITYA NAGRATH:** Perfect. Yeah, my background is, I started coding when I was 14 years old. I went to the university of Denver for undergrad and graduate school. Ended up with a PhD in math and computer science. And from there went on to start a contract software engineering firm where we had clients like Digidata, Verizon, Telefonica, we wrote apps that went out to a lot of big names. And from there we chose to kind of switch into our own products and we chose to start with elephant learning math academy due to a lot of the things that were mentioned in the intro. I learned about this from a professor of mathematics, that was my professor.

And then when we start to look into the solutions that were already out there, we figured out that we could put together a software package that was really designed to help the parent just get their child to understand in the classroom, because if we can get that to happen, then a lot of the challenges that we have

with math anxiety, for example, or people not understanding, or even not wanting to understand, start to alleviate.

**JAISON DOLVANE:** Right. Right. So explain to me kind of like what's the problem. I mean, why is it that the current education system is not sufficient for helping our kids learn math?

**ADITYA NAGRATH:** Well, the traditional way that mathematics has learned is sort of like, if you can repeat it over and over and over again, sooner or later, you understand it. And they're really focused mainly on the written mathematics. And they're also pretty focused on getting you to pass the test. And so like, the question becomes, how do you do it? And we teach the children how to do it, but really what's happening is that these symbols on the piece of paper represent ideas that are actually happening in the world around us. And we see it on a daily basis. And if we can connect that written mathematics to what's actually happening, then that is what is understanding in mathematics. That's what we're talking about here.

So, to make it more concrete like addition, give me five things, give me four more things. We write that as five plus four, but that idea of the quantities and getting more quantity, that's the idea of addition and for the child to recognize that it's sort of like learning language. In fact, it's exactly learning language. You're learning exactly what addition means, written down five plus four. But I like to equate it with the colors so that people understand exactly what I'm talking about. So when you taught your child the colors, for example, red, you showed them red things over and over and over again, until through context, they figured out you were talking about the color red. That's what our system does is we provide them these puzzles that when they solve them, they're exhibiting the ideas as we're labeling them so that they can connect the two. And then it also makes it very easy for the teacher in the classroom or the parent to connect the two, if they see that the child doesn't understand. But ultimately that is the issue when it comes to the classroom, which is that when it's 30 on one, it's very, very challenging, especially when you're teaching mnemonic to gauge understanding, because that's really more of a one on one activity.

**JAISON DOLVANE:** Right. Right. Yeah, I mean, I guess, you know, this is something that I've talked about previous, which is, you know, the education system

sometimes needs to default a low common denominator in the class just to keep everybody moving at the right pace.

**ADITYA NAGRATH:** Well, I mean, that's one way that you could approach it. I think another way that would be more beneficial is just if we were able to split the children into groups. And so that's actually what our teacher dashboard does. It allows you to figure out kind of quickly what are, like cohorts of understanding from children in the classroom. So if you get a cohort, which is say, like at the addition level, and then maybe there's a cohort that's maybe at the multiplication level right, now, you're able to kind of split the lecture and use the ideas that the children understand so that you're not talking over the lowest common denominator, which is what we're trying to avoid when we do that.

But then at the same time, you're not boring those students that do understand it by going very slow, you're able to speak to both at their level. If we did that, we'd be able to get those children that are behind to catch up. And that's what our system literally does is like, we just focus on the ideas. If I don't teach you how to do it, but you can participate with the conversation in multiplication and you understand what is, well, if you're participating in the classroom discussion and you're learning the methods for multiplication, and you're confident, but whereas if we try to focus on, let's get them every detail on how to do this between here and there. That's a lot of materials you don't recover that child.

**JAISON DOLVANE:** So what I'm hearing you say is, I think two things. One is, you know, maybe the current system is not connecting the dots as well between sort of concepts and application kind of in the real world. And the second thing I think I'm hearing you say is, you know, we're kind of doing a broadcast based teaching as opposed to more personalized learning only because it's not necessarily possible for one teacher to give 30 students one on one attention.

**ADITYA NAGRATH:** That's exactly correct. That's exactly correct. And there's one more kind of pitfall, which is a, it would be the word problems that help the teacher understand what the level is, right. Because the word problem is meant to mimic presenting a problem in real life. Right. But because we're so geared on showing the children how to do it and just having them say the right answer, we give of them the monic, that cheats the word problem. And so now we don't know if they understand or if they're just using the mnemonic.

**JAISON DOLVANE:** Give me an example of that.

**ADITYA NAGRATH:** Sure. So like the same example, five plus four, you might say, we're in a grocery store and you say, Hey, I need five bananas. And then, you know, the kid goes and picks up five bananas comes back. You say, you know what, I need four more, they go pick up four more. How many do I have now? They would somehow put this into a word problem form. But then the teacher would say, you just add the two numbers together, but now you can use the memorization of the tables of addition to say, oh, well, five plus four nine, So she told me, I add the two numbers together. We don't know now if they're adding, because they understand that addition is the solution to this problem, or if they're adding, because they receive the mnemonic.

**JAISON DOLVANE:** Right. Right. Okay. Okay. Yeah. I mean, I think I've probably seen word problems that are a little bit more complicated that are trying to sort of assess students based on understanding. But I think what you're saying is that there's maybe too many hints associated with it.

**ADITYA NAGRATH:** Exactly, exactly. Cause the goal is to pass the test. So then we try to turn it into multiple choice and try to reduce the answers. But ultimately we're cheating the system that helps the teacher understand, does the student understand, so then it becomes a one-on-one activity.

**JAISON DOLVANE:** Yeah, that's interesting. I mean, I think there's probably a really important, I guess I think you're explaining it very clearly, but it's subtle in that, what I'm hearing you say is that teachers are focused on the wrong goal, which is to get past, you know, the standard testing or whatever it is.

**ADITYA NAGRATH:** The bureaucracy gave them this goal. So it's not even their fault.

**JAISON DOLVANE:** And basically they're short cutting the learning activity by providing those hints.

**ADITYA NAGRATH:** Correct. And they might not even know that they're doing right. That's the hard part, right. Is like, again, when a student walks up to me even and says, well, how do I do this? My first reaction is to show them how to do it. Now I might pause and I might say, well, okay, hold on a second. Let me dig deeper to see if you understand this, because now I'm, you know,

very well versed on this, but even then, if I'm tired, if I'm right and you just kind of, how do I do this? My first reaction might be, oh, this is how.

**JAISON DOLVANE:** Yeah, no, absolutely. I mean, you know, this is such a common sort of like learning technique. We do this in so many things in life. And I think what you're kind of reflecting is we're doing it in math also. Which is like, you know, we're giving people answers as opposed to equipping them with tools for them to come up with their own answers.

**ADITYA NAGRATH:** Right. And in this case, the idea is the thing that we're labeling, the concept, the idea is the thing that we're labeling. So actually what we're doing is we're taking away a mental tool.

**JAISON DOLVANE:** Yeah. Makes sense. And I mean, give me some examples of labels that were applying to these things.

**ADITYA NAGRATH:** Well, so like the addition, right? It is the idea of give me five, give four more or it's just the idea of give more. You see what I mean? Like at the basis of it is that idea. And I mean, counting is the quote unquote, how do you do it. But when the student starts to understand, and I mean, leap progs, I mean, my child watches the counting lemonade. I like it, it's like over his head when he first started watching it. But like they say, like when you add, you get more, that's the idea. It's just so abstract is the problem. And like, we try to make it more concrete, by giving the children like what teachers call manipulatives, but like objects is what it is. Like give them objects and have them do it with bananas or cars or whatever we do it that way. But when we get to the classroom, it's nearly impossible to do it that way.

**JAISON DOLVANE:** So tell me how are you guys doing these things differently?

**ADITYA NAGRATH:** Well, so we are doing it through a gamification, so we've taken the puzzles. Like the one I just told you, and we've basically put them in an order that like, because it's about the order of understanding is really what it is. Once you've understood A, then you can understand B and I can give you some, like the classic example is addition to multiplication. If you don't understand addition, it's going to be really hard to understand repeated addition. So therefore you have to understand addition before you understand multiplication. But it's the, we take that and we represent it on the screen as a puzzle. I say, think angry birds, but for mathematics. But really if

you're a teacher, it's the manipulatives on the screen so that you don't have to have all that stuff for each student.

**JAISON DOLVANE:** Right. And so is this through sort of an app or are you guys kind of doing it one on one teaching?

**ADITYA NAGRATH:** Yeah. No, thank you for asking that. Yeah, It's delivered as an app. We support iOS, Android, Amazon Kindle fire. We also support Chrome and safari on web. And it was literally built because we didn't know where we'd have to put this in. The problems that you discussed happen along income lines. So it could be like, oh, we have to be on these Chromebooks that are \$50. So we just basically built it for web. But this can insert basically anywhere. Our only mission is to empower children with mathematics.

**JAISON DOLVANE:** Right. So, you know, you mentioned income lines. I just want to like dig into that a little bit. I mean, I think I read that somewhere else, which was that, you know, you say that sort of, I think what you're sort of alluding to is that you know, someone with a lower socioeconomic type of status might actually end up with kids that has a lower math proficiency than someone with a higher socioeconomic status. Is that kind of what you're saying? And why is that?

**ADITYA NAGRATH:** Well, so that's what the research stat that I'm quoting. But yeah, that's what it says. It says like say in the lowest 20% income fifth, like guess is the best way to say it on average three years behind from a conceptual level. So if you think about what that means is that if you're in the third grade and they're trying to push multiplication onto you, you have the understanding of a kindergartner from the perspective of just the written mathematics and what's happening. The good news is though that you still have life experiences that involve mathematics. And so like, as we teach you that language, that's still there.

So like, for example, this morning, we just got a review from a parent on one of our ads, a comment on Facebook. It said that my child went from elephant age 6.3 to elephant age nine in four weeks. So I asked how old is the student? The student is nine years old, has ADHD and has been struggling with mathematics. So about three years behind from a conceptual level. In other words, we gave them questions like, you know, basic questions. They were having troubles with that. Now they're working on multiplication questions, they've caught up to their age. The reason why that is, is because again, that

nine year old has already had three years' worth of experiences. They've been in the classroom for three years of experiences. Now those experiences make sense. So they catch up very quickly.

**JAISON DOLVANE:** Okay. Interesting. So just to go back to the income question though, so why is it in your view that, you know, the sort of bottom fifth is not good at math?

**ADITYA NAGRATH:** Yeah. So I asked this question of the professor when he gave me the statistic and that research is actually on our, about us page, cause it's part of the why, right. Why are we doing this? Well, here's this socio problem that like this product was designed to solve, but it happens to be everyone's problem. And he said it was because the top 20% income earners are able to afford to send their children to preschool. And I mean, overall they have more time for the children, more resources for their children. Another piece of research that he handed me said that every dollar that you put into your child's education, like it's an ROI graph. It basically looks like one over X, it veers towards infinity as you get to age zero. And it kind of levels out towards zero as the child gets older. But it's just that like...

**JAISON DOLVANE:** And just to sort of simplify that, what you're saying is that the more money you spend earlier on in their life is going to give you a higher ROI on their education.

**ADITYA NAGRATH:** That's exactly what this piece of research said that one's not on our website, but I could send that to you.

**JAISON DOLVANE:** Very interesting. Yeah. Very interesting. So then yeah, kind of the system that you actually have you know, what age group is it relevant for?

**ADITYA NAGRATH:** Well, we actually cover from counting through algebra. We're about to add personal finances this week. So like by the time someone's listening to this, it'll probably be an out. But basically we started with counting because we figured if we could solve the problem in the preschool kindergarten level, then that child never has math anxiety. So, and then we just kept building up from there. So we very quickly had through fractions, decimal percentages. And then we started working, how do we add algebra? But we cover the algebra and we created the algebra course to recover the students that we see in university that are struggling with upper low level mathematics.

Typically they're struggling with algebra, but it's not in the prerequisite. So as a TA in the university of Denver, I saw that firsthand and the problem is, is that like with the way that the system is built, right? You look at that as a TA and you say, well, you're like six years behind cause you should have learned this in the eighth grade. You're in college, not my problem. You're going to need to go take the prerequisite for the course. So we built it to recover that student, right? Like if you go through this thing, you'll understand enough written mathematics that you'll start to understand what's happening in this classroom.

**JAISON DOLVANE:** Okay. Got it. So just again, it was from preschool until when?

**ADITYA NAGRATH:** Adults can take this if they want.

**JAISON DOLVANE:** Okay. So you've got material in there that is quite advanced.

**ADITYA NAGRATH:** It's the primer for algebra that makes it so that if you taking, say university statistics. And you took our algebra course, now statistics is going to be a lot easier for you. You're going to understand it a lot better. And so like, yeah, I don't want to put [17:24 inaudible].

**JAISON DOLVANE:** I've got an 8 year old, so seems like this would be perfect for him, but I've also got like a 13 year old who's in high school. I mean, is this applicable to her?

**ADITYA NAGRATH:** Yeah. Yeah, exactly. That's what we're trying to say. Yeah.

**JAISON DOLVANE:** Sounds good. So, Aditya you know, what are some of the challenges that you have actually faced you know, trying to get kind of your message out there, trying to get people to really sort of take to this?

**ADITYA NAGRATH:** Well, I mean, the thing that we discussed earlier is kind of the primary one. That's why I'm speaking to that more and more. The main thing is this, right? Like everyone I talk to about this, when I talk to them one on one about it, they get it, the light comes on, but it's kind of hard to do in a Facebook add, or a sound snippet or if you're in the system and you're just upset about it and it's around that idea of how do you coach your child around

mathematics? And so the example that I'm giving these days is around basketball, right? So I say with basketball, if your child shoots and the ball doesn't go in, what do you do?

And the common answer is, well, try again. Even if the child is frustrated, we say, try again. But with mathematics, that's not what we do. We don't have the child try again. We try to force the ball into the hoop by either showing them how to do it or helping them. We make the answer raw wrong. We're very like, as a species, we're very like, just like, oh, it's got to be right. If it's not right, then there's a problem. But in the wrong in the mistakes is actually the gold, right. The gold is we can figure out what is the misconception. We can guide them towards understanding through either giving them a hint or, you know, addressing immediately what is the language that they didn't get. And in that also, right? Like is the maturity around answering incorrectly, right. Because if you have that attitude of, okay, this is in correct, but there's not an emotion around it. There's more of a can do attitude for lack of a better word. Like a can do, like, I can approach this another way, I can give it another try. I am going to do this, that kind of an attitude. That's going to work a lot better as a life skill, not just in mathematics everywhere.

**JAISON DOLVANE:** Yeah. Makes sense. So you started this company, you've sort of been going through this journey. Has there been any sort of changes at a personal level, any kind of transformation as you've sort of been moving through this?

**ADITYA NAGRATH:** Yeah. I mean, I've been taking leadership courses, which I mean requires you to look at personal transformation, but then on top of that, we've taken on a mission of empowerment. And so we've really had to sit down and understand what means to be empowered.

**JAISON DOLVANE:** And what have you sort of derived from that?

**ADITYA NAGRATH:** Some of the things I just told you about, right? Cause like that's the empowerment piece, right. If the child can see that they can do it, if they can believe that they can do it, that is what empowerment is. And in order for that to happen, they actually have to try and they actually have to do it. And so that's the piece from that side for like say the adult or for the coach or whatever, understanding that, and then understanding my emotions around this situation and the stories that I'm telling myself around it, that's the work, the leadership work, and the transformation work.

**JAISON DOLVANE:** And I mean, when you sort of talk about empowerment for children, you know, part of this is just for them to start, right. And so, I mean, is this so something that you're seeing has to be driven by the parents?

**ADITYA NAGRATH:** So a lot of times a child will come into our system, they'll start playing the games, we'll find their level very quickly. So it feels good to them. And most of the time they will make progress on their own. They'll use it on their own. They'll want to play it on their own. Sometimes you're going to get a child that has math anxiety already, and you're not going to be passing one over on them. They're going to look at this and they're going to say, this is math, and they're going to find potentially either an excuse or they maybe don't want to use it. But there are methods that we have that will help empower the child. Like for example, we help give them a choice for if they don't want to play it's common for children to do worksheets. So we've made these worksheets so that you can offer an option between, do you want to do the worksheets or do you want to play the games?

Well these types of things help, we also put in things like, you can turn off any voices you don't like, you can choose whichever character you want to play with. So like maybe you don't like angry birds, maybe you like angry eggs or angry balloons, or I don't know, we have maybe 110 different characters in there. They vary by age. So like, by the age of the student, we might show it. We might not show it. Yeah. And like we've has done everything that we can to kind of make it accommodatable so that like, if the student is saying something like that, well, one as the parent, you have some sort of recourse like, oh, well, you don't like that voice? Fine, I'll turn it off. So their excuses get back to the fact that I just don't want to do math, but then we can address the problem directly because then we're now talking about it once they've said that out loud, well now we know what the problem is.

**JAISON DOLVANE:** Got it. Got it. No, sounds very cool. So just tell us how much does this cost and do you guys have kind of a free trial on this?

**ADITYA NAGRATH:** Yeah, we do. So it's a three day free trial. That's enough to get through the placement exam typically. And it's \$55 per month. That covers up to seven students. It's three at signup, but it's you message support. We'll open it up to up to seven. At that point, the UI kind of gets messed up. We do that because what we found out was that if we do one or two students or like we do it per child, if they leave out the younger children and the younger children were the ones that were benefiting the most because

we see four or five year old's that don't understand that this is ahead. Like, this is quote unquote ahead. So then they look at it and they say, well, this is a game. And then they play and they get to multiplication, division and they never have a problem with anxiety around mathematics.

**JAISON DOLVANE:** Got it. Okay, So really, I mean, what you're saying is that for like \$55 a month for like, basically, you know, if someone's got three kids, they can go in, they can have them use it for three days and figure out what their math age is. And then for \$55 a month, they can get all three kids started.

**ADITYA NAGRATH:** That's absolutely right. And we send them a report after they finish that placement exam, which tells them which questions that the student missed and like how to maybe have a conversation around it because sometimes a student might say, well, I hit skip, or I did this, or I did that. And there's ways to put them back into that placement mode. So like that report gives you a very comprehensive method of being able to talk to the child and understand what's going on. And we also let you share with your students teachers. So like, if you think that, like this report is accurate and you want to send it to the teacher so that the teacher can understand the level it shares to the teacher for free, the teacher gets an account for free.

**JAISON DOLVANE:** Very cool. Very cool. Sounds like a great service. Actually probably worth trying it out here at some point.

**ADITYA NAGRATH:** Awesome. Thank you.

**JAISON DOLVANE:** Tell me, do you have kids?

**ADITYA NAGRATH:** Yeah, I have a five year old. Who's about to turn five and I have a, I guess a one month old.

**JAISON DOLVANE:** One month old. Okay, Wow! So really new parents. I'm sure you're struggling with getting sleep some nights or at least your wife.

**ADITYA NAGRATH:** Yeah, exactly.

**JAISON DOLVANE:** So Aditya is there one feeling you have as a parent that you would rather not feel?

**ADITYA NAGRATH:** Well, no. So the answer to that question is that the empowerment work, the leadership work that we've done, that I've done. What I've learned is that, most of the problems that we experience in life come from avoiding an emotion. And the trick is, is that it's kind of like a Chinese finger trap, right? The more you kind of pull out and you try to avoid it, the more it grab on to you. So what has to happen is you actually got to go in and you got to feel that emotion. So yeah, at this point there is no emotion that I don't want to feel or that I'm trying to avoid, because I know that, that when I see that, then I immediately become like, okay, so then I got to go feel that emotion.

**JAISON DOLVANE:** Got it. But you don't have anything that you're, you know, you sort of like a situation where you're actually feeling something where with your kids, that you'd rather sort of, you know, not want to be in that sort of world.

**ADITYA NAGRATH:** I mean, there's a lot of situations that children are going to bring up that maybe you don't want to be in. But like this is what I would say from a coaching perspective is that like I try to accept things just immediately as quickly as I can. Cause if you don't accept, then actually what's happening is psychologically speaking, You're on like the, the spectrum of grief, right? So like typically starts with denial, this isn't happening and then anger, maybe I'm angry about this and then so on, so forth. So like you can shortcut that entire process of grief by just accepting right now, consciously accepting, saying it out loud, this just happened. This is how I started now. I just say it in my head. But that acceptance of this is the situation then gives us the power to deal with the situation regardless of what it is. So I can't control the situations that are happening. I definitely don't want to be in the situation where my child is kind of afraid of math, but you know, if that happens, I'll accept it and take the mythological step.

**JAISON DOLVANE:** Okay. And yeah, what's your hope for your audience?

**ADITYA NAGRATH:** I mean, I'm just hoping to get value from anything I'm saying, cause what I've understood is that if I can provide the value then people will find a way to use it.

**JAISON DOLVANE:** Yeah. And you know, like I think you have a really sound mission around math. So hopefully, sorry, empowering children. And I'm sure that's not just about math, but if they feel they can do that, it helps them feel they can do other things.

**ADITYA NAGRATH:** It becomes something that even as a coach, as a parent, right, Parent coach, parent/coach that then you can also apply elsewhere. Right? So like, Hey, whoa, you did it with math. I bet you can do it with history. I bet you can do it with basketball. I bet you can do it, It's just getting that drive of I can do it. That's ultimately it.

**JAISON DOLVANE:** Fair enough. So Aditya, you want to just tell the audience where they can reach you guys?

**ADITYA NAGRATH:** Absolutely. If you come to [www.elephantlearning.com](http://www.elephantlearning.com) or Google us elephant learning you're going to find us. You can also probably see a lot of the stuff we're doing on Facebook. We're trying to get out to other channels. So now you might start to see a presence on Pinterest and Instagram and maybe next door, etc. So like, you know you'll see us out there. If you're looking to find me, if you try to connect on LinkedIn and you don't send me spam, I'll probably connect you.

**JAISON DOLVANE:** Okay. Great. Sounds good. Thank you Aditya. I really appreciate you being here.

**ADITYA NAGRATH:** I appreciate you having me here. Thank you so much.

[Outro]

Thank you for listening.

**SUBSCRIBE:** Make sure to subscribe to this podcast on [Apple podcasts](#) or [Spotify](#) or wherever you listen, we would really appreciate if you can leave us a review on apple podcasts or send us any feedback to [reachingroots@wishslate.com](mailto:reachingroots@wishslate.com).

**SIGN-UP for the WishSlate App:** Find items from any stores, save items to one list and share, buy, gift from family and friend lists. Visit <https://app.wishslate.com>

[Resources & Links]

Get Your Child's Math Age in 3 Days for Free  
<https://www.elephantlearning.com>