

# Big Picture Podcast - Episode04a

## The Back Story

### *Academic Endurance, Interview with Stephanie Blake*

© Conceptual Academy



**Tracy:** Welcome to Chem 101: The Big Picture Podcast, with your hosts, John and Tracy Suchocki.

**John:** Ah ha! We've made it to episode 4, we are so glad to have you on board.

**Tracy:** Time for a little switch up in format?

**John:** Indeed. You know we have two segments to each podcast, right?

**Tracy:** Right, the Back Story and Do the Review

**John:** Yup, so listeners have been asking, can you split those into two smaller podcasts?

**Tracy:** We can and will.

**John:** Though I have to admit, I like that the first few episodes have the two segments combined.

**Tracy:** Wait. Why?

**John:** I know my students. They'd skip right over the backstory and go straight to the review.

**Tracy:** So, now we're making it easier for them to do that.

**John:** Well. But please note, we've got some awesome interviews lined up for upcoming back story episodes.

**Tracy:** We have a marine biologist from Srippl Institute.

**John:** A rocket space engineer from . . .

**Tracy:** Shh! Wait. Remember he asked that we keep that private.

**John:** Right. And more. So really. Please do stay tuned to this first segment of each podcast.

**Tracy:** And for today's back story of episode 4, we've got Stephanie Blake.

**John:** A super-instructor.

**Tracy:** As you'll hear, she's so passionate about working with students, helping them learn not just about the content, but about themselves and how to thrive in this world.

**John:** Which is to say, she's got sage advice, not only for students but for us instructors too.

**Tracy:** And I would say society as a whole.

**John:** So, we recorded this interview at a recent conference of the National Science Teacher's Association. The subject of this interview?

**Tracy:** We had no idea. It wasn't until after the interview that we realized the overarching subject was academic endurance.

**John:** Academic endurance. Awesome.

**Tracy:** And you wanted to mention the thing about Step 3?

**John:** Yes. In this interview, with Stephanie, you'll hear a reference to Step 3 learning. Now, I know you're already familiar with Step 1 and Step 2 learning. That's input followed by output, right? Well, in the interview with that space engineer, during that interview, bamm, we realized the nature of a third step to learning, which is the predominate form of learning we do AFTER graduating from college.

**Tracy:** Synthesis.

**John:** Yup. We'll talk about synthesis in a future episode.

**Tracy:** But Stephanie's interview definitely needs to come now, here toward the beginning of the course.

**John:** Agreed. You're gonna like this. I'd say it starts out real practical and then concludes on the inspirational. Tracy?

**Tracy:** Stephanie Blake teaches physics and chemistry currently at Ozarks Technical College in Springfield, Missouri. Stephanie also spent 16 years teaching at-risk students and AP physics in urban high school settings. Her initial background is actually in biology, anatomy & physiology. Stephanie is a marathon runner and author of "My brain is noisy" a soon-to-be released book on Aspergers syndrome.

**John:** Stephanie welcome to the big picture podcast.

**Stephanie:** Thanks for having me.

**John:** What advice do you have for a student for an exam coming up?

**Stephanie:** I am really passionate that learning is an active process that should be done with others. If you think about brain chemistry for really thousands of generations prior to these things called books and the Internet learning was passed on through the senses it was passed on through song and dance and stories and that's really how our brain is wired. Even today it's it's not designed to just read over your notes three times and get it or read over the PowerPoint three times and get it. It needs to be an active process where you're in a group setting you're quizzing each other. You're actively

engaged with the material you're working out problems. You're pushing each other talking through answers so that everyone can see what the. The right kind of thinking is in the wrong kind of thinking particularly in math based Sciences where the problem solving is there

**John:** So I want to underscore here something you just said is that yeah it's a good way to learn because we're built that way.

**Stephanie:** We are built that way. Yeah

**Stephanie:** We have to use our senses. That's technically learning occurs whenever neural synapses undergo a physiological change.

**John:** Mm

**Stephanie:** And the only way you can do that is through sensory integration.

**John:** You mean I can't just sit there and read the book and get everything from it?

**Stephanie:** No

**Stephanie:** You know there's

**Stephanie:** A lot of emphasis these days on folks like to isolate themselves with Facebook and social media. We've become a very isolationist kind of of society and that's really not the best way to learn.

**John:** So in terms of your advice. They have an exam coming up. It's to get out of that cubicle.

**Stephanie:** Absolutely. Go seek out study sessions at your school go seek out tutoring centers at your school. Research in Education has shown that if you read something you're 10 percent likely to retain it. If you hear it you're 20 percent likely. If you speak it you're 30 percent likely if you engage in multiple modalities 40 percent likely. If you teach it to others 50 to 60 percent likely.

**Stephanie:** So you get a better bang for your study Buck. If you are doing it with others who are also serious about setting. That's the thing too. We have what I call frenemies. You can have great friends but in a study situation they become your frenemies. If they are distracting you or not taking it seriously or not really bringing something to the table.

**John:** So when an instructor sits you next to someone you don't know then.

**Stephanie:** That absolutely can have some more positive benefits than perhaps sitting by someone that you do know. I find that there's this pressure when you're sitting by someone new to

**John:** Mm hmm.

**Stephanie:** To bring it

**John:** On.

**Stephanie:** Whereas

**John:** Yeah.

**Stephanie:** Whereas when you're next to your friend like you know each other's weaknesses and you don't you don't bring it.

**John:** You're not going to push yourself

**Stephanie:** Right.

**John:** Yeah.

**Stephanie:** So you know when you know that you're coming into a study session I find that students will often say Oh God I need to study before I go to that study session because everybody

**John:** Oh

**Stephanie:** Feels like they

**John:** Yeah.

**Stephanie:** Want to contribute equally to the learning environment.

**Tracy:** You are so passionate about learning. Well, how do you keep learning yourself?

**Stephanie:** I am a lifelong learner. I love learning I love the process of learning so I'm taking every single class at ATC that my students take after me. I went ahead and took their AP one class there A and P to class their organic one organic to their respiratory anatomy class pathophysiology. These are all classes I had had an undergrad with my biology degree but it had been 20 years

**John:** Hmm

**Stephanie:** And I wanted to see it from their perspective with their professors and so I got permission to take them all. And so when I'm teaching chem 160 I can say listen this is this is where you're going to need to know this when you get into organic or when I'm teaching you know physics 1 to 5 I can say listen you're going to need to know this when you get into physics 123 and it just gives a little bit more merit to for them to know I had your experience I've been there I've done that. Your professor is going to have this level of expectation from you. I know because I was just in his class.

**John:** I qualify Stephanie Blake here as not only an expert instructor but as an expert student as well.

**Stephanie:** So my passion is twofold. It's not just the content because God bless. I do love the content of biology chemistry and physics but I'm also really intrigued by pedagogy the process of getting knowledge from one human being to another. What is the best journey for doing that. You know it's not. Stand and Deliver via a powerpoint. That's not the best teaching modality it's not the best learning modality. So what is that marriage that has to occur so that we make this an efficient process on both sides.

**John:** I find

**Stephanie:** Think

**John:** Variety in there is an important element in which I would argue a PowerPoint here and there has its place

**Stephanie:** Absolutely.

**John:** But not all the

**Stephanie:** Time.

**John:** Another interesting aspect is the worksheets have their place but not all the time.

**Stephanie:** Sure.

**John:** So

**Stephanie:** The variety

**John:** I find it is that key to keeping keep next space. And I think in the context of what you're saying is keeping it sensory because you're hitting it from all different all different angles.

**Stephanie:** Agreed. And you know today's learner really doesn't have what I call academic endurance. They can last for about 10 minutes before they're twitching and needing to check their cell phone over their twitching and just need to check that Facebook page. And I have real conversations with them about we need to increase your academic endurance. We need to by the end of this 16 weeks make it to where you can go a solid hour without

**John:** hmm

**Stephanie:** Twitching to check your cell phone. Because some of them are gonna have to sit through a four hour in class test or a seven hour MCAT or a four

**John:** Or.

**Stephanie:** Hour GRC. Right. And delayed gratification is a really important soft skill that employers are telling us that students are lacking. So one of the things that is really important to me is I'm going to change whatever sensory input I'm doing in my classroom at least every 20 minutes. And I literally we were talking about this earlier. I literally set a timer in my classroom and after 20 minutes of me either lecturing or discussing a concept it now has to default back to the students. And so they are then going to work a problem or we're gonna do a demonstration or we're gonna do an activity or we're gonna do a lab and I'm super fortunate at ATC in that we don't have lecture time and lab time. It's actually integrated

**John:** See

**Stephanie:** A

**John:** That hybrid

**Stephanie:** We. It is a

**John:** High

**Stephanie:** Hybrid situation and all of us physics professors at ATC teach in that

**John:** Honor.

**Stephanie:** Manner

**John:** Excuse

**Stephanie:** That

**John:** Me is that

**Stephanie:** Mit.

**John:** Mandated from admin or is it something the community of instructors has come



**Stephanie:** It's

**John:** To

**Stephanie:** What the

**John:** Agree

**Stephanie:** Community

**John:** Upon.

**Stephanie:** Of instructors have all done because we're all interested in that pedagogy

**John:** Tell me.

**Stephanie:** Component

**John:** There's

**Stephanie:** We're

**John:** That

**Stephanie:** Not.

**John:** Word again.

**Stephanie:** Yeah we're not required to do research.

**John:** And

**Stephanie:** We can focus just

**John:** Mm

**Stephanie:** On

**John:** Hmm.

**Stephanie:** The instruction

**John:** There are

**Stephanie:** Or.

**John:** Many advantages. Therefore you're saying going to community college.

**Stephanie:** Absolutely.

**John:** Yeah.

**Stephanie:** Absolutely. We are focused on the instruction. We don't have a different person teaching the lab who may or may not remember the content might be a master student. You know that the content of the lab may or may not be aligned with what we're doing in lecture

**John:** Here

**Stephanie:** Because it's

**John:** Of.

**Stephanie:** All integrated together. The students really get this holistic package in there they're learning.

**John:** You said something earlier about having endurance study endurance. This is to say what is exercising their brain essentially. And you can have a brain that can get stronger with more exercise. And I often wonder what that means what's actually going on. On a structural level in the brain in terms of exercising we all know that takes energy. You got a good night's sleep. You get at me. Make sure you've eaten right to

have the energy does start pumping it pumping the iron to go to go for a marathon whatever. What are the good habits one might have to be exercising their brain. Do you just got all at once or did a little bit at a time. It's somewhere in between.

**Stephanie:** So the technical term that you're describing is brain plasticity

**John:** Brain

**Stephanie:** The

**John:** Plasticity

**Stephanie:** The ability to make and break neural connections regrow neural connections make new networks of connections and it is exactly like training for a marathon you don't go out and just run a marathon. It does have to happen incrementally. You have to you know keep working the physiology

**John:** You're changing

**Stephanie:** Your

**John:** Body

**Stephanie:** You are absolutely changing your brain when you are learning

**John:** For

**Stephanie:** New information. So

**John:** You know

**Stephanie:** You know with with geriatric populations we want to make sure that they are constantly socially engaged. They're they're playing card games and board games and doing sudoku shoes and reading. And that's important. Even through middle age are you continuing to grow and grow. Which is my my family's personal motto.

**John:** Growth

**Stephanie:** Yeah. Are you going and growing

**John:** Really

**Stephanie:** In terms of being a student. You have to make sure that your training in multiple ways just like you would for a marathon. Are you doing sprints as well as endurance training as well as stretching and

**John:** Also

**Stephanie:** A well

**John:** Rounded. Exercise

**Stephanie:** Absolutely. And so your brain is the same way. Am I watching videos. Am I doing practice questions. Am I quizzing with other people. You have to train through through multiple manners as

**John:** That.

**Stephanie:** Well

**John:** That explains the sensory thing you're talking about because when you're doing through the the dance the visual through hearing auditory you're getting well-rounded exercise then.

**Stephanie:** Absolutely.

**John:** Well well

**Stephanie:** So

**John:** That

**Stephanie:** Those are

**John:** All different pathways to different parts of the brain.

**Stephanie:** You. Absolutely. There's a reason that people like to use mnemonic devices

**John:** That.

**Stephanie:** To memorize

**John:** New.

**Stephanie:** Large quantities of information. And it's a huge tactic in med school where I can't think of

**John:** More

**Stephanie:** Information being shoved

**John:** Of

**Stephanie:** Into your brain at any given time.

**John:** Memory palace

**Stephanie:** Right. And you know that just goes back to the concept that the brain learns through pattern and singsong and you know verbal and auditory cues

**John:** To this podcast series we've been exploring how people learn and what you're saying there is just just awesome to hear it spelled out very nicely. Thank you. One thing we look at is that we've been defining we call step 1 step 2 learning and our listeners you'll be very familiar with us by now. Step 1 is where you're inputting information. Step two is where you're out putting information in a recent interview. We discovered Step 3 which appears to be synthesis where step 1 is input and that can feel comfortable. Step two is output and that can feel uncomfortable and you don't want to do it homework. Step 2 step 3 we're looking at is synthesis. It can actually be quite

enjoyable where you have a foundation of information knowledge a knowledge base and from that you're progressing beyond in creating new ideas from new situations.

**Stephanie:** So we also want to look at quality inputs quality outputs because I have a lot of students were like I studied for six hours for this test

**John:** How

**Stephanie:** And like. But how did you

**John:** Use

**Stephanie:** Study rate so a quality input doesn't look like rereading my notes rereading the PowerPoint. My favorite of all time is when they just sit and watch the entire class period and then just take a picture with their cell phone of whatever they see on the board. That's not quality input right

**John:** This

**Stephanie:** Quality output doesn't mean I've

**John:** Read

**Stephanie:** Re copied

**John:** Copy.

**Stephanie:** My

**John:** I

**Stephanie:** Notes

**John:** Know

**Stephanie:** I've

**John:** Read

**Stephanie:** Re copied

**John:** Copy

**Stephanie:** The PowerPoint

**John:** With

**Stephanie:** Xeon

**John:** Good handwriting.

**Stephanie:** Ready right now

**John:** That

**Stephanie:** I can read it. I highlighted my notes. So we want

**John:** Went

**Stephanie:** To make sure I love your three step process but we also want to look at the quality that you are doing as the the mental athlete if you will

**John:** Along the way.

**Stephanie:** Mm hmm.

**John:** You

**Stephanie:** Could

**John:** Had also

**Stephanie:** Make

**John:** Mentioned something about going

**Stephanie:** Go

**John:** And growing.

**Stephanie:** Right.

**John:** Could

**Stephanie:** You talk

**John:** About that

**Stephanie:** A little bit. Sure. So that is my personal mantra as well as the mantra of my children. So we want to constantly be trying new things experimenting with new ideas new activities keeping that brain plasticity up but as well as adventuring through this journey called life or a life can be really boring if you just get in a groove and do the same thing all the time. And I have to say I mean go off on a tangent

**John:** Engine

**Stephanie:** Here

**John:** Hmm.

**Stephanie:** As a high school teacher for 16 years. We really almost taught a facade and I look back on it I reflect back on it I almost feel guilty. We tell students subconsciously if you'll just go to college get the degree get the job you'll be happy. And so we have all these people who go to college get the degree get the job and a few years and they're like I'm so bored I'm depressed I don't have anything else

**John:** What's



**Stephanie:** Going on and

**John:** Not

**Stephanie:** I'll

**John:** Happy.

**Stephanie:** Be right and I want to say well what are you doing with your brain. What's something new that you're finding that's challenging and interesting because it's so easy to stagnate you know. Are you working towards a promotion. Do you want to maybe get a new degree. Do you want to maybe hike something or climb something or try a new hobby or join a hiking club. We as human beings need to constantly be trying new things grow

**John:** Go and

**Stephanie:** Grow and grow and grow.

**John:** So when you go and keep moving pushing yourself

**Stephanie:** You

**John:** Will grow.

**Stephanie:** Right. We want to be a little bit better today than we were yesterday. Oh but better tomorrow than I am today. I call it the  $n + 1$  rule, but I also like programming.

**Tracy:** Was there a time when you found learning really difficult? And that you had an experience of seeing that, "Oh, my gosh." If I can just go, you know, the extra mile, this is going to change how I think about things.

**Stephanie:** So I had a student last year in Chem One to one and I want to tell her about this podcast because I want her to know that she touched me and then I I want her to know this. She was a non-traditional student. She hadn't been in school for 20 years. Her math background was really pretty minimal and she was struggling so badly in my

chem one to one class she got a D on the first test and was just crushed and she worked her tail off. She saw where her weaknesses were. She did a self-assessment and she started actively inputting actively outputting actively synthesizing reaching out to other students in the class reaching out for every tutorial she could get her hands on reaching out to me whenever you're asking for fresh ideas about approaching a concept and I have five tests and a final in that class by the fifth test. She was the highest grade and she had a ninety nine percent on the final

**John:** Mm hmm.

**Stephanie:** And she was so inspiring to me to be the comeback kid from those odds having not stepped foot in a classroom in 20 years. And to just really dig in and win that marathon I was so proud of her. And she is my hero.

**John:** There's a book "Make it Stick". Talks about optimizing your learning capacities. In one of the messages in that is so optimistic pointing out that one's mental ability for a healthy individual is way out there. I think there's a misconception in terms of oh well they're getting good grades simply because they're smart as instructors. We will sit with lots of students during our office visits and those students who are doing really well they are asking questions like crazy and they might say they're silly questions but they are questions and they're moving and you see the amount of effort these students put into the course and then you see their results. And so I just want to dispel any misconception in terms of the students who are doing really well. Oh well they're just doing well because they're smart. It's far more the case they're doing well because they're putting forth effort because they're motivated. And I think frankly as an employer one would really much rather hire someone who is motivated to do what they can.

**Stephanie:** Yeah if I could I'd like to take a second to address what what you're really describing as academic prejudice. So in our society we value sports a lot and we assume that if someone is good at sports that they worked really hard for it.

**John:** He

**Stephanie:** They

**John:** Practiced

**Stephanie:** A lot and they pushed themselves and we assume that if someone is getting good grades it's because well they were born that way. And so you know when someone on Facebook brags about their kid you know doing really well in baseball or really well in soccer we say oh my gosh congratulations he's such a really hard worker so proud of them. If you make it to the Olympics he's a really hard worker. He dedicated

**John:** He did

**Stephanie:** So much of his time he sacrificed so much but the same is true of the kiddo who is also doing well academically. They probably sacrificed Facebook time for setting. They probably sacrificed social life for studying. They sacrificed going out on Friday and Saturday for watching a documentary. They probably sacrificed just as much time and energy and I think it's really hurtful in our society that we tell the parent who's bragging about their kids academic accolades that they're bragging they're often shut down. I've seen that with my own children. I've seen it with other students. We've made it to where if you ask a student you know what did you get on the ACT they'll bashfully bow their head and say well I got a 32 instead of saying I got a 32 right. Shonda Rhimes in her book A Year of Yes talks about how women and minorities will often talk about their celebrations with a downward tone almost apologetically

**John:** Genetically.

**Stephanie:** And we shouldn't do that we should celebrate academia just as much as we do athletics. If you've got a pep assembly with the football team down on the floor let's bring down the Science Olympiad team and congratulate them as well. Let's bring down the trivia team and celebrate them as well. Right. It's not just about cheerleaders and athletics and that's coming from someone who was a cheerleader and also in athletics.

**John:** Effort is the underlying term here.

**Stephanie:** Right. It's erroneous to think that smart kids were just born that way.

**John:** Yeah.

**Stephanie:** Or smart kids just had good genes

**John:** Yeah.

**Stephanie:** Right. If it's something that they valued, they had to sacrifice for it as well.

**John:** But within that also there's a cultural component and that I would see as an issue within today's society in terms of the sports model. I use the sports model routinely in my class because it works so well. It's interesting to hear you talk about it in terms of the sports. That appreciation should certainly apply to the great effort one has in in academia. So I see the issue it's a cultural. Ideally if we're gonna get more people to succeed. We need a culture of learning that spreads from the campus to the community. And I think you've pointed out a solution already earlier in this podcast. You are pointing out that one of the best ways to learn is as a community

**Stephanie:** Absolutely.

**John:** Together.

**Stephanie:** And I really like that you're bringing in the sports component. I would like to share with you my personal philosophy of education. I don't consider myself a teacher. I consider myself an academic coach. And in my physics class I say: "All right team physics," or "All right team chemistry..."

**John:** Perfect.

**Stephanie:** Right? So a good coach doesn't train, we'll use a baseball metaphor, or a good coach doesn't train their pitcher the way they train their catcher, the way they train their in field the way they train their outfield, right? They have four almost

**John:** Hmm

**Stephanie:** completely different tactics in any given practice and the same is true of our classroom. We shouldn't be applying a homogeneous pedagogy to our classroom. We have to allow for differentiated instruction different ways of assessing them, different

ways of presenting the material, so that we can hit all four of those different kinds of athletes, mental athletes,

**John:** Hmm

**Stephanie:** in our classroom. Right? In addition a good coach goes through what I call the  $n + 1$  rule. They find the natural ability level of all of their athletes and they push them one step farther than they would naturally push themselves. And that's my job as the teacher is to find your natural ability level and push you one step farther than you would naturally push yourself right. And I want to look at the learner holistically. I don't want to just look at them academically but also behaviorally and that includes the college setting. Do you have the ability to have delayed gratification and keep that phone in your pocket for my entire class period. I also want to look at them socially. So I'm going to do cooperative learning in my classroom and group coordination with individual accountability. I want to make sure I don't say the word group work because that is not at all what we do group work in plays that there's one person doing work and three people watching in my classroom. There is group coordination but individual accountability and a good coach does the same thing. They have to train their running their batting and they're there catching right. So we have to look at the student holistically and I think by the college setting we assume o students already have mastered their you know behavioral Pete component and their social component. And we're finding because of social isolation and media and Facebook know those skills are underdeveloped in the 18 and 19 year old and we're having to teach some of those high school skills at the college level to our young folk

**John:** Here's a fast ball over home plate. What's your greatest hope for your students.

**Stephanie:** It's really threefold. I know all of my answers are super lengthy but I'm just so passionate

**John:** Yes

**Stephanie:** About all of these topics so

**John:** Please.

**Stephanie:** Yeah there are there are three objectives to any class that I teach any subject area. First of all I want you to enjoy the journey. I was saying earlier that in Springfield we have the Discovery Center and everyone loves going there.

**John:** That's a museum?

**Stephanie:** Yes. it's got physics and chemistry and biology and everyone comes out whether you are 22 or 82 smiling having fun you learned something. So why then when we put it inside the four walls of a classroom does it become the bane of your existence. That tells me that there's something wrong in the teaching and learning if you don't come out just as Smiley as you were coming out of the Discovery Center. So I want us to experiment with teaching and learning methodologies that has everybody smiling. That's the first thing. Let's enjoy the journey. The second thing is that I want science topics to become part of casual conversation. So when you're you know sitting down with colleagues you're like oh my gosh I learned the coolest thing in physics class the other day. Or when you're if you're an adult and you're sitting down with your children you're saying hey did you guys know that blah blah blah. And it stimulates a conversation with your kids or if you're a student and you're maybe every once in a while sitting down with dinner with your parents or you're at Christmas dinner or thanksgiving dinner you're like oh my gosh. My favorite class is physics because we blah blah blah. So I want these concepts to become part of casual conversation not just something we discuss with our instructors within the four walls

**John:** To have

**Stephanie:** Of

**John:** A

**Stephanie:** Community.

**John:** Of learning

**Stephanie:** There we go. Absolutely. And the third one is that I want I want students to learn physics and chemistry and biology in ways that are meaningful to them that they can see all around them. So if we're talking about the potential energy in a spring why

are we using abstract concepts like my favorite physics question of all time is you're on an elevator with a balance hanging from the ceiling with a fish in it. What what. Oh I want to open up a stapler and look at the Spring Inside the stapler and talk about the potential energy in that because I know what that looks like. I want to talk about the potential energy in the spring in my mattress because I like jumping on it

**John:** Yeah

**Stephanie:** Right. I want us to see science in everyday objects all around us. When I turn on my car I want to see physics and chemistry. When I go to a farmer's market I want to see biology and biochemistry. So we need to teach it in ways that are meaningful and applicable.

**John:** So one enjoy the journey to have a learning community in three enjoyable and applicable to our everyday lives.

**Stephanie:** You get it that synthesis component.

**John:** Stephanie Blake thank you so much for joining us here at the big picture podcast.

**Tracy:** Thank you

**Stephanie:** Thanks for having me.